



Assessing the potential for crowdfunding and other forms of alternative finance to support research and innovation

Final Report

January – 2017



Research and
Innovation

EUROPEAN COMMISSION

Directorate-General for Research and Innovation

Directorate B — Open Innovation and Open Science
Unit B.3 — SMEs, Financial Instruments and State Aid

Contact: Steve Rogers

E-mail: Steve.rogers@ec.europa.eu

RTD-PUBLICATIONS@ec.europa.eu

*European Commission
B-1049 Brussels*

Assessing the potential for crowdfunding and other forms of alternative finance to support research and innovation

Final Report

EY

Open Evidence

Politecnico di Milano

European Crowdfunding Network

***EUROPE DIRECT is a service to help you find answers
to your questions about the European Union***

Freephone number (*):
00 800 6 7 8 9 10 11

(* The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you)

LEGAL NOTICE

This document has been prepared for the European Commission however it reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

More information on the European Union is available on the internet (<http://europa.eu>).

Luxembourg: Publications Office of the European Union, 2017.

PDF

ISBN 978-92-79-59130-3

doi: 10.2777/046608

KI-01-16-636-EN-N

© European Union, 2017.

Reproduction is authorised provided the source is acknowledged

Table of Contents

LIST OF TABLES	5
LIST OF FIGURES	5
LIST OF ACRONYMS.....	7
ACKNOWLEDGEMENTS.....	9
ABSTRACT.....	10
EXECUTIVE SUMMARY.....	11
EXECUTIVE SUMMARY (FR).....	18
1. INTRODUCTION	25
1.1 Objectives and scope of the study.....	25
1.2 Methodological overview.....	26
1.3 Content of the report	28
2. THE ROLE OF ALTERNATIVE FINANCE FOR R&I	30
2.1 Estimating AF funding for research and innovation.....	30
2.1.1 Size of the Alternative Finance Market Worldwide	31
2.1.2 Estimating the share of the AF going to R&I	32
2.1.3 Geographical distribution and cross-border dimension of AF for R&I	35
2.2 Typologies of R&I funded by AF	36
2.2.1 Breakdown between research and innovation	36
2.2.2 Application sectors.....	38
2.2.3 Riskiness of AF	39
2.2.4 Size of AF R&I projects	39
2.2.5 Type of AF funding for type of R&I	40
3. PLATFORMS	42
3.1 Overview	42
3.1.1 Funding models of platforms	43
3.1.2 Thematic specialisation of platforms	45
3.1.3 Business models of platforms	47
3.1.4 Selection criteria for R&I projects.....	49
3.2 Bottlenecks.....	53
3.2.1 Platform-specific challenges	53
3.2.2 Country-specific barriers to THE development of AF platforms	54
3.2.3 Barriers to cross-border operations of AF platforms.....	55
3.2.4 MiFID 's role in assisting AF platforms to operate cross-border	57
4. FUNDRAISERS	59
4.1 Overview	59
4.1.1 Motivations behind launching AF campaign	59
4.1.2 Types of AF for R&I beneficiaries	60
4.1.3 Enterprise crowdfunding	61
4.2 Bottlenecks.....	63
4.2.1 Key success factors of AN AF campaign	63
4.2.2 Barriers for fundraisers.....	66
5. INVESTORS.....	70
5.1 Overview	70
5.1.1 Investors ' motivation to use AF	71
5.1.2 Insitutional investors and AF	71
5.1.3 AF Investment criteria	72
5.2 Bottlenecks.....	74

5.2.1	Barriers to cross-border investments For INVESTORS	76
6.	ECOSYSTEM	78
6.1	AF and financial pipeline for R&I	78
6.2	AF and financing ecosystem	80
6.3	AF and Fintech trends	83
7.	POLICY RECOMMENDATIONS.....	84
7.1	Investors	84
7.1.1	The problem of uptake of AF for R&I by investors	84
7.1.2	Discussion of policy options.....	85
7.2	Platforms.....	88
7.2.1	The issue of sustainability of business models	88
7.2.2	Discussion of policy options.....	88
7.3	Fundraisers.....	90
7.3.1	The issue of awareness, lack of skills and lack of trust.....	90
7.3.2	Discussion of policy options.....	90
7.4	Ecosystem	92
7.4.1	The issue of THE financing pipeline and building AN AF for R&I ecosystem	92
7.4.2	Discussion oN policy options.....	92
7.5	Final policy recommendations.....	93
7.5.1	Recommendations in support of overall AF.....	94
7.5.2	Recommendations in support of AF for research and innovation.....	97
7.5.3	Recommendations in support of AF for innovation.....	98
7.5.4	Recommendations in support of AF for research	100
8.	CONCLUDING REMARKS	101
	BIBLIOGRAPHY	102

LIST OF TABLES

Table 1 Final policy recommendations	16
Table 2 Overview of the objectives of the study	25
Table 3 Overview of the methods to be used for each objective.....	28
Table 4 Quantitative estimates of AF funding for R&I	34
Table 5 Average size of R&I funding between different instruments (EUR)	40
Table 6 Platform fees	47
Table 7 Pre-selection quality criteria of AF platforms specialising in R&I	51
Table 8 Prioritised EU policy measures in support of AF for R&I	93

LIST OF FIGURES

Figure 1 Breakdown of the European alternative finance market by model, 2014.....	31
Figure 2 Market data 2013-2015 (Billion Euro)	32
Figure 3 Share of crowdfunding going to R&I, by type of platform	32
Figure 4 Share of crowdfunding going to R&I, 2013 to 2016	33
Figure 5 Share of alternative finance going to Research and Innovation, by type of platform	34
Figure 6 Number of European projects by country	35
Figure 7 Cross-border transactions	36
Figure 8 Research versus Innovation in R&I projects – European projects.....	36
Figure 9 Different funding patterns of innovation and research projects	37
Figure 10 Project funded fields according to platforms (left) and users (right)	38
Figure 11 Trend in average funding size for R&I project (€ / years)	39
Figure 12 AF instrument per innovation stage	40
Figure 13 Number of platforms with R&I scope in Europe	43
Figure 14 Funding model of platforms with R&I scope in Europe	44
Figure 15 Hybrid models of platforms with a R&I scope in Europe (%)	44
Figure 16 Funding models of platforms in Europe (%)	45
Figure 17 Areas of specialisation of European R&I-oriented platforms	46
Figure 18 Selection criteria used by platforms	49
Figure 19 Actions to be taken by platforms to increase their attractiveness	53
Figure 20 Perceived impediments to AF development.....	54
Figure 21 Cross-border: drivers and barriers.....	56

Figure 22 Type of main Beneficiary of R&I CF projects – EU projects (ex. Kickstarter).....61

Figure 23 Factors determining the success of an AF campaign64

Figure 24 Barriers of an AF campaign.....67

Figure 25 User perspectives on information and transparency68

Figure 26 Factors influencing investors backing a R&I project via AF72

Figure 27 Platforms insuring lenders against default risk74

Figure 28 Other sources of finance before and after AF78

Figure 29 Indicated financial resources for further project development (several replies possible) 79

Figure 30 Eco-system players80

LIST OF ACRONYMS

AF	Alternative Finance
AF RI	Alternative Finance for Research and Innovation
AIF	Alternative Investment Fund
AIFMD	Alternative Investment Fund Managers Directive
AoN	All-or-Nothing
BA	Business Angel
CF	Crowdfunding
CHF	Swiss Franc
COSME	EU programme for Competitiveness of Enterprises and Small and Medium-sized Enterprises
CRD IV	Capital Requirements Directive IV
DG RTD	Directorate General for Research and Innovation
EAF	European Angels Fund
EC	European Commission
ECN	European Crowdfunding Network
EIF	European Investment Fund
EIS	Enterprise Investment Scheme
EU	European Union
EUR	Euro
FG	Focus Group
GBP	British Pound
GDP	Gross Domestic Product
ICT	Information Communication Technology
IPR	Intellectual Property Rights
KIT	Karlsruhe Institute of Technology
KiA	Keep-it-All
KPI	Key Performance Indicator
LCIF	London Co-Investment Fund
MiFID	Markets in Financial Instruments Directive
MS	Member State
MOOC	Massive Open Online Course
NGOs	Non-Governmental Organisations
P2P	Peer-to-peer
R&D	Research & Development
R&I	Research & Innovation
SC	Societal Challenge
SEIS	Seed Enterprise Investment Scheme

SILC II	Sustainable Industry Low Carbon II
SMEs	Small and medium-sized enterprises
SPIRE	Sustainable Process Industries
TRL	Technology Readiness Level
USD	USA dollar
VC	Venture Capital

ACKNOWLEDGEMENTS

Disclaimer: The information and views set out in this study report are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which may be made of the information contained therein.

The study was led by Open Evidence together with EY, the European Crowdfunding Network (ECN) and Politecnico di Milano (POLIMI).

Authors

Katarzyna Jakimowicz - Open Evidence

David Osimo - Open Evidence

Claudia Gallo - EY

Giulia Pappalepore - EY

Conny Weber - ECN

Project team:

Enrico Coletta - EY

Claudia Mastrapasqua - EY

Chiara Franzoni - POLIMI

Cristina Rossi - POLIMI

Vincenzo Buttice - POLIMI

Olivier Gajda - ECN

Francisco Lupianez-Villanueva - Open Evidence

Pietro Tornese - Open Evidence

Ilaria Vigo - Open Evidence

Federica Porcu - Open Evidence

Marcello Verona - Open Evidence

Stevan Randjelovic - Open Evidence

Acknowledgements

The study team would like to thank all the stakeholders of the wider crowdfunding ecosystem (investors, platforms, fundraisers, policy makers, national regulators and broader innovation ecosystem players) that have contributed to the research by taking part in surveys, interviews, focus groups and the final European Policy Workshop.

In particular, we would like to express special acknowledgment to the crowdfunding platforms that shared their data for the platform data analysis: Invesdor, CrowdCube, OnePlanetCrowd and Ulule, as well as to the organisers of the Innovative Enterprise, ECN Crowd Camp, Crowd Dialogue and SME instrument Innovators Summit for collaborating in the organisation of the focus groups.

ABSTRACT

This report provides an assessment of whether alternative finance has the potential to help Europe address the problem of access to finance for innovative companies and bridge the gap in terms of access to risk capital, and if EU action is needed to support development of the sector. To this aim, the study produced the following results: 1) an estimation of the size of the alternative market for research and innovation, together with a typology of sectors and of alternative finance funding models suitable for research vs. innovation; 2) an analysis of the European alternative finance landscape for research and innovation; 3) an analysis of the challenges limiting development of the alternative finance, and alternative finance for research and innovation in particular; 4) an assessment of policy options addressing those challenges; 5) a final recommendation of priority action at EU and national level to exploit the opportunities of alternative finance for research and innovation.

EXECUTIVE SUMMARY

I. Purpose and context of the study

Access to finance is one of the main challenges for European companies, in particular those that are smaller, younger and more innovative (European Commission, 2015h).¹ Studies show that the total Small and Medium-sized Enterprise (SME) financing gaps for European countries are three to five times bigger than for the US (Silanes et al., 2015). At the same time, innovative companies face more limited access to business angel (BA) capital (EBAN, 2014) and venture capital than their US counterparts. In this context, alternative finance (AF) can play an important role in helping to fund innovative companies in their early growth and scale-up phase (Filippov and Hofheinz, 2016). Alternative finance in Europe is growing fast, but its size is still small compared to other world regions. The total value of the European AF market was estimated between EUR 4.2 billion (Crowdsurfer-EY, 2015) and EUR 5.4 billion (Cambridge-KPMG, 2016) in 2015 - around one fourth of the US alternative finance market and 18 times the cumulative value of the Asian and Chinese AF market (Cambridge-KPMG, 2016) report. It is growing more slowly than these regions and its pace of growth is slowing down, whilst others are accelerating. The Peer-to-peer (P2P) lending model is the dominant AF model in Europe (72% of the alternative finance EU market in 2015), however, the equity model registers the most rapid growth, and its importance is mostly attributed to innovative companies.

Within the growing phenomenon of AF, it is still unclear how much funding is going to research and innovation (R&I). This study aims to deliver a holistic picture on the potential of alternative finance to improve access to risk finance for research and innovative ventures in the EU, together with the assessment of the need for EU policy action in support of AF for R&I. It is structured along three main objectives that cover a long list of research questions (as included in the Annex):

- 1) To quantify and qualify the potential of alternative finance in Europe with regard to research and innovation;
- 2) To identify key challenges influencing the development of AF, and AF for research and innovation in particular;
- 3) To recommend actions to overcome those challenges and to exploit the opportunities of AF for R&I.

This study is unique in terms of scope, as it concentrates on R&I only, so that the analysis and policy recommendations focus on the specific aspects relevant for R&I funding by default. Nevertheless, in many instances, it touches upon general AF trends, where they are relevant.

II. Scope and methodology

Methodology

The study adopted multiple methods with the aim of cross-analysing results from different sources, and reaching out to a variety of stakeholders, in line with the Better Regulation approach. It is important to highlight the innovative nature of the study itself. At the core of the study lies the **platform data analysis**, a unique methodological approach developed by the Politecnico di Milano, based on the computerised content analysis of the project descriptions. In total, the ten platforms that were analysed² included 263,781 projects that were launched between 2009 to 2016 by fundraisers located in 161 countries and using six languages.

Other methods employed by the study include:

- Desk research - over 260 literature sources have been used in the study; the study team performed an analysis of over 550 AF platforms, in order to create the final database of 232 European AF platforms with an R&I scope;
- Surveys - 55 responses received by a survey of platforms and 45 responses through a survey of users (fundraisers and potential fundraisers);
- Interviews - 60 interviews have been performed with AF stakeholders: investors, policy makers, regulators, fundraisers, AF platforms and eco-system players;

¹ According to the recent ECB SAFE Survey: October- March 2016, 10% of SMEs declared it as an issue.

² Crowdcube (UK), DavinciCrowd (FR), Futsci (UK), Goteo (ES), Invesdor (FI), Kickstarter (US), OnePlanetCrowd (NL), RocketHub (US), Ulele (FR), Derv (IT)

- Case studies - 10 detailed cases were performed (eight on AF projects & two on AF platforms);
- Focus Groups (FG) - 4 FGs were organised, structured around investors, platforms, fundraisers, and eco-system players;
- Country fiches - 43 country fiches were prepared³, focusing on the snapshot of the AF market, and AF for R&I in particular;
- A website presenting country fiches and a database of AF platforms with an R&I scope was created;
- Extensive online stakeholder engagement was delivered throughout the study, through the website crowdfunding4innovation.eu and social media presence.

Finally, the findings of the study were further validated through the final European Policy Workshop (26 participants).

Scope of the study

The study focused on projects whose main aim is 1) scientific research, 2) initiatives aimed at generating products and services that address new and unsatisfied market needs, and 3) initiatives aimed at satisfying existing market needs by adopting novel combinations of services, methods and technologies, including organisational and social innovation. Thus, the study excluded from the analysis all of the AF initiatives a) directed at artistic or cultural endeavors; b) which do not entail a sufficiently creative or innovation aspect; c) initiatives of personal causes and d) funding whose primary benefit is individual-specific.

For the purpose of the study, the definition of research in accordance with the Frascati Manual (OECD, 2002) was adopted. Research and Development (R&D) is defined as: "*creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications*". With regard to innovation, according to the OECD Oslo Manual (OECD, 2005), innovation is defined as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.

The study covers all kinds of AF funding models based on the common taxonomy used by both (Cambridge-EY, 2015) and (Crowdsurfer-EY, 2015) report: Peer-to-peer consumer lending, P2P business lending, equity-based crowdfunding, rewards-based crowdfunding, donation-based crowdfunding, mini-bonds and invoice trading. However, not all methods cover all of these instruments. Platform data analysis has only been applied to instruments that, according to the literature, are most relevant for R&I, such as equity, rewards and donation-based crowdfunding. Mini-bonds and invoice trading have not been included in the data gathering because of their limited potential for R&I, according to the exploratory interviews and literature review.

III. Key findings

The role of alternative finance for R&I

The estimated aggregated value of AF investment in R&I in the EU was approximately EUR 755.1 million in 2015, which constitutes between 1/6 and 1/8 of the total value of the European alternative finance market⁴. AF plays a significant role in funding European R&I, especially when compared to the Horizon 2020 budget of approximately EUR 10 billion annually. However, whilst considering the strong difference in size and growth rate of AF between Europe and the rest of the world,⁵ it is clear that European innovators are not benefiting from AF to the same extent as their competitors from other regions of the world. The development of AF is very unbalanced between Member States, and AF for R&I follows the same trend (81% of the volume is represented by the UK and 78.1% of the R&I projects are based in the UK). Moreover, AF for R&I remains mostly domestic (70% of the platforms indicated that the percentage of funding coming from a different country is less than 20%) and less than 10% of cross-border activity happens between EU countries (Crowdsurfer-EY, 2015).

³ 28 EU Member State; each country associated with COSME; each country associated with Horizon 2020; Switzerland, Ukraine, US and China.

⁴ Depending on the AF market estimations used.

⁵ While analysing non-EU data is beyond the scope of this project, our platform data analysis report "innovation intensity" rates at global level in line with the EU average, if not slightly superior.

Looking at the different types of R&I, it appears that AF is more suitable for:

- 1) Later stages of the innovation cycle, when the results are easier to anticipate and evaluate by the "crowd" (according to the study results, there are on average 3 times more innovation-oriented projects than research-oriented projects),
- 2) Innovation related to the improvement of life-conditions (energy, environment, food, health),
- 3) Less capital-intensive initiatives (e.g. not for nanotechnology and research in space).

Moreover, there is a clear distinction between funding models for research vs. innovation. Donation and rewards-based funding models are mostly suitable for basic research, whilst equity and in part lending and reward, are useful for later stages of the innovation cycle, closer to market. Finally, projects funded by equity and lending platforms are bigger than those funded by rewards and donation, thus innovation AF campaigns are bigger than those focused on research. R&I projects (regardless of the platform) raise, on average, more funds than other projects but have lower success rates

Platforms and their business models

The AF market is highly competitive, with a clear advantage for the first-comers. Although the number of active platforms has been growing over the years, the number of platforms founded in a specific year has been steadily decreasing since 2014. The majority of AF R&I platforms are autonomous, profit-oriented companies (73% of surveyed platforms). Yet most of the platforms are relatively small with a turnover below EUR 500 thousand (78% of surveyed platforms) and, in particular, research oriented platforms have a problem in finding a sustainable business model.

An analysis of the database of relevant AF platforms revealed that there are, on average, two times more generic platforms than strictly R&I-oriented platforms. This is not surprising, taking into consideration the basic business model of AF platforms, which is based on the success fees charged to fundraisers and investors as a percentage of the sum gathered or invested (usually 5-10%). Most of the platforms do not charge any fee unless the project is successful. The broader the range of the platform, the stronger the ability to attract more projects and investors. Key success factors of AF platforms include a reliable network of fundraisers and investors, offering different AF models, and offering at least some form of mentorship for fundraisers. Thus, there's a growing importance of the hybrid funding model (over 20% of all AF R&I platforms) as a way to accommodate the needs of diverse projects. Similarly, the "All-or-nothing" (AoN) funding model dominates (73% of surveyed platforms), being perceived as safer by investors (Oxera, 2015).

Another key success factor mentioned is the national/ international recognition of a platform. The latter is specifically important in the context of cross-border operations, perceived by platforms as a natural way to scale-up. However, regulatory fragmentation at EU level and the existence of different regulatory regimes amongst different countries are named as the main obstacles in cross-border operations. So far, nine countries introduced their own bespoke AF regimes (Austria, Spain, France, UK, Italy, Germany, Portugal, and most recently Finland and Lithuania).

Concerning platforms specialising strictly in R&I, the majority of the AF platforms adopt equity funding models (over 50%) followed by hybrid funding models (24% of platforms). The major distinctive categories of R&I-oriented platforms include: renewable energy and energy efficiency (32.5%); innovation, start-ups and SMEs (32.5%); health & life sciences (12.5%).

Project feasibility and economic impact are the main factors taken into account by platforms when selecting R&I projects. R&I-oriented platforms perform a pre-quality check of projects before listing them (usually through a scientific or advisory board, and according to a set of quality criteria), although there is no standard approach (it differs between platforms, funding models, area and degree of specialisation of AF platforms).

Key challenges of AF platforms

- Platform specific: profitable business model, network for crowd engagement, managing return expectations of investors, transparency around investors, crowd liquidity, gaining the trust of investors.
- Country specific: development of AF platforms is correlated with the maturity of alternative finance market, availability of AF, cultural readiness and the existence of support measures, as well as lack of impediments.
- Cross-border: regulatory fragmentation at EU level and the existence of different regulatory regimes amongst countries.

Fundraisers

Individual innovators and entrepreneurs (around 45-55%) along with SMEs are the main beneficiaries of alternative finance and AF for R&I. The uptake by universities is still very limited in scope. According to interviewees, they are neither aware of AF, nor too eager to experiment with it.

The main drivers for using alternative finance by fundraisers are the same for overall AF and AF for R&I: easier access to finance; validation of the product's market potential; and the use of AF platforms as marketing tools/ communication channels, and as a way to create a network of contacts and partnerships. Other drivers mentioned by fundraisers include personal interests and raising awareness of the project-specific cause.

The key success factors of the AF campaign are attributed to the strength of the communication strategy: depth of project description, frequency of project updates, provision of attractive video material and graphical visuals. For research projects, the credibility of the researchers behind the project is crucial.

The project related factors follow: size of the pledging goal, and duration of funding period. Finally, the choice of the appropriate platform, one with experience and a good reputation, as well as the adequate funding model, are particularly important for fundraisers.

Conversely, a key barrier for fundraisers is the lack of specific skills, such as creation of a business plan, communication experience, lack of know-how on relevant AF models and their suitability for different AF projects, and a lack of resources (time and financial). These factors might be attributed to a general perception that AF is more complex and requires higher level of expertise. Finally, the doubts about the credibility of a platform and the transparency of a platform's operations prevent fundraisers from using alternative finance.

Key barriers for fundraisers

- Fundraiser-related: lack of specific skills (creation of a business plan, development of appealing communication), lack of awareness of AF and its specific models, lack of resources.
- Platform-related: credibility of platforms, transparency of a platform's operations.
- Project-related barriers: complexity of acquiring AF as compared to other financing options, disclosure/ Intellectual Property Rights (IPR) issues.
- Ecosystem-related: lack of sufficient integration of AF into financing pipeline.

Investors

The role of institutional investors remains limited when it comes to AF for R&I. Institutions were responsible for only 24% of peer-to-peer business lending investments, and only 8% of the investment on equity-based crowdfunding came from institutional investors in 2015 (Cambridge-KPMG, 2016). Similarly, surveyed platforms declared that, on average, 5% of investors are institutional investors and more than half of platforms reported not having institutional investors registered at all. Professional investors use AF platforms to test the market potential of projects (so called "proof of concept") before placing higher investments outside AF platforms in order to avoid platform fees.

Although investments through AF platforms are driven by expected higher financial returns, this is not the only motivation. Factors such as the diversification of an investment portfolio (investing small amounts in a larger number of projects) and risk sharing, due diligence and validation of the project by the market, play an equally important role. Moreover, a distinguishing feature of investments in AF projects is that they are driven by emotion and personal motivations (understood as the personal direct interest in the topic and philanthropic motivations). It is important to note that investors using equity and lending AF models, thus investing in innovations, are more driven by financial motivations. Those investing in rewards and donation-based crowdfunding are more purpose-driven, and are therefore more prone to invest in basic research.

Other than personal motivations and financial returns, investors take into consideration the size and scope of project, R&I stage of the project, team composition and the effectiveness of the platform, whilst deciding to invest in a specific AF project. Moreover, as far as equity and lending AF is concerned, investors prefer investments on local AF platforms, as different alternative finance regimes make investing cross-border riskier in terms of market knowledge, legal costs and complexity of the liability proceedings.

Overall, the transparency of a platform's operations is considered as a priority area for improvement.

Key barriers for investors

- Ecosystem-related risks: reliability of AF as a form of investment and lack of regulation.
- Project-related risks: financial aspects of projects, lack of collaterals, general liquidity of the market.
- Fundraiser-related risks: lack of expertise and management skills.
- Investor-related risk: no real understanding of the potential of the product raising money
- Platform-related risk: asymmetry of information, manipulation of credit scoring, and inappropriate due diligence checks.
- Exogenous factors: new market players, negative condition of the economy, regulatory changes.

Ecosystem and future trends

Alternative finance is perceived as a supplementary, rather than alternative, source to other forms of financing for R&I (about 63% of fundraisers tried to get funding from other sources before or during AF; 50% did so after AF). Investors and platforms mention a leverage effect for AF. Notably, obtaining initial funding through an AF platform attracts further investments from professional investors, business angels and institutions that follow the "crowd". AF is considered as a way to bridge the equity gap that can be observed at the seed stage. However, it is also seen by some as a way to further promote the development, commercialisation and growth of innovation-oriented projects.

Nowadays, AF platforms with an R&I scope collaborate mainly with accelerators and incubators for project sourcing (48% of surveyed platforms), business angels (30%) and banks (29%). There is a growing consolidation and institutionalisation of the AF sector – 48% of P2P consumer lending platforms, 22% of P2P business lending and equity crowdfunding indicated at least some level of institutional ownership (Cambridge-KPMG, 2016). Indeed, incumbent players, such as banks; venture capitalists (VCs) and business angels channel their investments through AF platforms, either by developing collaborations with existing platforms, or by setting up / acquiring own platforms. Nevertheless, there is a need for the further development of sustainable links between ecosystem players.

IV. Conclusions and recommendations

Policy options address the challenges of each of the four dimensions: platforms, investors, fundraisers and ecosystem. There are four layers of potential policy actions: 1) EU action in support of alternative finance in general; 2) actions in support of alternative finance for research and innovation (AF RI); 3) actions for AF for innovation only, and 4) actions for AF for research.

To further develop alternative finance for research and innovation, there is the need to address the underlying issues for alternative finance in Europe as a whole. Furthermore, whilst most of the policy measures are equally relevant for both research and innovation, AF for research would benefit more from additional tailor-made support or science-specific measures due to higher barriers and underdevelopment of the alternative finance market in that respect.⁶ Table 1 summarises the final recommended actions.

⁶ Suggested policy measures for innovation: guarantees and EU match funding are innovation specific due to the nature of relevant funding models that are more suitable for financing innovation, rather than due to the need of innovation field itself.

Table 1 Final policy recommendations

Policy recommendation	Description
<ul style="list-style-type: none"> Recommendations in support of Alternative Finance in general 	
Facilitating the clarity of cross-border operations for AF platforms	<ul style="list-style-type: none"> Guidelines / recommendations on AF legislation for all Member States. The EU should come up with minimum standards to be included (e.g. pragmatic investor protection) and aspects to be avoided (such as prospectus requirement for smaller projects). Guidelines on cross border investments for platforms, and platforms for R&I, to enhance the understanding of different regulatory and legislative regimes.
Promoting the standard for transparency of AF operations.	<ul style="list-style-type: none"> Facilitating the creation and promotion of the Code of Conduct for AF platforms. The EU facilitated system of self-regulation could strengthen trust between the stakeholders of the ecosystem. Promoting standardisation in the way results from AF campaigns are reported (Key Performance Indicators) and minimum standard criteria for the selection process of projects by AF platforms.
Creating a European AF information and advisory hub	<p>One-stop shop for AF that provides information services on AF models for fundraisers and investors, and their suitability for specific projects and sectors; organises trainings and events on AF; shares best practice examples with regard to AF, and connects stakeholders on national and regional level, amongst others.</p>
Financial education	<p>Developing Massive Open Online Course (MOOC)-like trainings on AF, facilitating exchanges of good practices between countries, but also between platforms on how to raise awareness and education on AF.</p>
Tax exemptions at national level for investments in AF	<p>Tax deductibility of investments in AF at national level is considered to be the most effective way to increase the general uptake by investors. There is a crucial role for the EC, on the one hand, to encourage and support the adoption of similar measures at national level. On the other hand, they have to ensure that these measures do not evolve into additional barriers to cross-border investment.</p>
<ul style="list-style-type: none"> Recommendations in support of alternative finance for research and innovation 	
Quality endorsement of R&I platforms	<p>Open repository of science-related platforms, based on the set of specific pre-set criteria, e.g. platforms should be active and have active projects, they should commit to the Code of Conduct and standardised reporting.</p>
Support for AF campaign preparation – micro- grants	<p>European micro-grants to finance preparatory costs of an AF campaign as a quick solution to the lack of fundraiser skills. The sort of costs covered could include the costs of consulting services for the creation of a successful campaign (advisory services of an AF consultant, PR services, video and graphic communication, business plan development).</p>
<ul style="list-style-type: none"> Recommendations in support of alternative finance for innovation only 	
EU Guarantee	<p>Guarantee mechanisms for lending, managed by the platform, are considered to be a good way for promoting higher risk-taking investment whilst minimising drawbacks at national and regional level.</p>
EU matching funds / co-investment	<p>Platforms specialised in the field would pre-select projects which, after reaching a specific level of funding from the "crowd" / professional investors, would receive the remaining money from EU funds. In practice, that would mean that the EU would commit to contributing a certain percentage of the pledged amount (platforms mention 30% of a total sum pledged) or a certain sum from the start, up to a specific agreed level. Only after reaching this level, the EC would contribute the remaining amount.</p>

- Recommendations in support of alternative finance for research only

EU support to science platforms for sustainable business models	Support for the creation of a scientific-board by 1) opening EC research / science expertise (database of experts) to assess projects; 2) EU using a pre-selection process of projects by the "crowd" for project validation; 3) demanding the involvement of AF in certain calls.
Education of research institutions on AF for R&I	<ul style="list-style-type: none"> • Alternative Finance Service Package for Research Institutions on how to use the potential of alternative finance. It should: include an explanation of suitable alternative financing models for basic research, applied research, innovation; include info on existing R&I platforms as well as training materials for successful AF campaign preparation; promote best practices from the countries and provide a selection of platforms for proven cases. • Pilot phase with a couple of research institution in order to promote real case examples.

Whilst there is no strong evidence of market failure justifying hard policy intervention, it is clear that there is lots of room for beneficial soft policy intervention. However, to be effective, this intervention will require careful design and extensive collaboration with stakeholders: alternative finance will require smart, data driven and collaborative policies.

EXECUTIVE SUMMARY (FR)

I. Objectives et contexte de l'étude

L'accès au financement est l'un des principaux défis pour les entreprises européennes, en particulier les plus petites, jeunes et innovantes (Commission européenne, 2015h). Plusieurs études montrent que les écarts de financement des petites et moyennes entreprises (PME) dans les pays européens sont trois à cinq fois plus élevés que pour les États-Unis (Silanes et al., 2015). Au même temps, les entreprises innovantes sont confrontées à un accès plus limité au capital des *business angels* (BA) (EBAN, 2014) et au capital de risque que leurs homologues américaines. Dans ce contexte, la finance alternative (FA) peut jouer un rôle important en aidant à financer des entreprises innovantes dans leur phase de croissance et d'expansion (Filippov et Hofheinz, 2016). La finance alternative en Europe connaît une croissance rapide, mais sa taille est encore faible par rapport aux autres régions du monde. En 2015, la valeur totale du marché européen de la FA était estimée à 4,2 milliards d'euros (Crowdsurfer-EY, 2015) et à 5,4 milliards d'euros (Cambridge-KPMG, 2016), soit environ un quart du marché américain des financements alternatifs et 18 fois la valeur cumulée du marché asiatique et chinois de la FA (Cambridge-KPMG, 2016). Elle croît plus lentement que ces régions et son rythme de croissance ralentit tandis que d'autres s'accroissent. Le modèle de Peer-to-peer (P2P) est le modèle FA dominant en Europe (72% du marché financier alternatif de l'UE en 2015), mais le modèle d'investissement en capital enregistre la croissance la plus rapide et joue un rôle particulièrement important pour les entreprises innovantes.

Au sein du phénomène croissant de la FA, on ne sait toujours pas combien de fonds vont consacrer la recherche et l'innovation (R & I). Cette étude vise à fournir une vue d'ensemble du potentiel de la finance alternative pour améliorer l'accès au financement du risque pour la recherche et les entreprises innovantes dans l'UE, ainsi que l'évaluation de la nécessité d'une action politique de l'UE en faveur de la R&I. Il est structuré autour de trois objectifs principaux qui couvrent une longue liste de questions de recherche (comme indiqué en annexe):

- 1) Quantifier et qualifier le potentiel des financements alternatifs en Europe en matière de recherche et d'innovation;
- 2) Identifier les principaux défis qui limitent le développement de la FA, et FA pour la recherche et l'innovation en particulier;
- 3) Recommander des actions pour surmonter ces défis et exploiter les opportunités d'FA pour la R&I.

Cette étude est unique en termes de portée, car elle se concentre uniquement sur la R & I, de sorte que l'analyse et les recommandations de politiques se concentrent par défaut sur les aspects spécifiques pertinents pour le financement de la R & I. Néanmoins, dans de nombreux cas, il touche aux tendances générales de la FA, là où elles sont pertinentes.

II. Portée et méthodologie

Méthodologie

L'étude a adopté de multiples méthodes dans le but d'analyser de manière croisée les résultats de différentes sources et en consultation avec des stakeholders différents, conformément à l'approche «Better regulation». Il est important de souligner le caractère novateur de l'étude elle-même. Au cœur de l'étude se trouve l'analyse des données de plateforme, une approche méthodologique unique développée par le Politecnico di Milano, basée sur l'analyse informatisée de contenu des descriptions de projet. Au total, les 10 plateformes analysées comprenaient 263 781 projets lancés entre 2009 et 2016 par des collecteurs de fonds situés dans 161 pays et utilisant six langues.

D'autres méthodes employées par l'étude incluent:

- Recherche documentaire - plus de 260 sources littéraires ont été utilisées dans l'étude. L'équipe a effectué une analyse de plus de 550 plates-formes FA, afin de créer la base de données finale de 232 plates-formes européennes FA avec une portée R & I;
- Sondages - 55 réponses reçues par un sondage sur les plateformes et 45 réponses par le biais d'un sondage auprès des utilisateurs (actuels et potentielles);
- Interviews - 60 interviews ont été réalisées avec des stakeholders de la FA: investisseurs, décideurs, régulateurs, entrepreneurs, plates-formes FA et acteurs de l'écosystème;
- Études de cas - 10 cas détaillés ont été réalisés (huit sur des projets FA et deux sur des plates-formes FA);

- Focus groups (FG): quatre FG ont été organisés, structurés autour des investisseurs, des plates-formes, des collecteurs de fonds et des acteurs de l'écosystème;
- Fiches de pays - 43 fiches de pays ont été préparées, en se concentrant sur l'instantané du marché FA, et FA pour la R & I en particulier;
- Un site Web présentant des fiches de pays et une base de données de plates-formes FA ayant une portée R & I a été créé;
- Une vaste participation des stakeholders en ligne a été fournie tout au long de l'étude, grâce au site crowdfunding4innovation.eu et à la présence des médias sociaux.

Enfin, les résultats de l'étude ont été validés par la conférence finale sur la politique européenne (26 participants).

Portée de l'étude

L'étude a porté sur des projets dont l'objectif principal est 1) la recherche scientifique, 2) les initiatives visant à générer des produits et services répondant à des besoins nouveaux et non satisfaits du marché, et 3) les initiatives visant à satisfaire les besoins du marché en adoptant de nouvelles combinaisons de services, technologies, y compris l'innovation organisationnelle et sociale. Ainsi, l'étude a exclu de l'analyse toutes les initiatives FA a) orientées vers des projets artistiques ou culturels; B) qui ne comportent pas un aspect suffisamment créatif ou innovateur; C) les initiatives de causes personnelles et d) le financement dont le principal avantage est spécifique à l'individu.

Aux fins de l'étude, la définition de la recherche a été adoptée conformément au Manuel de Frascati (OCDE, 2002). La recherche et le développement (R & D) sont définis comme suit: «le travail de création entrepris systématiquement pour accroître le stock de connaissances, y compris la connaissance de l'homme, la culture et la société et l'utilisation de ce stock de connaissances pour concevoir de nouvelles applications». En ce qui concerne l'innovation, selon le Manuel d'Oslo de l'OCDE (OCDE, 2005), l'innovation est définie comme la mise en œuvre d'un produit ou d'un service nouveau ou sensiblement amélioré (procédé ou service), une nouvelle méthode de commercialisation ou une nouvelle méthode d'organisation. Les pratiques commerciales, l'organisation du lieu de travail ou les relations extérieures.

L'étude couvre toutes sortes de modèles de financement FA basés sur la taxonomie commune utilisée par les deux rapports (Cambridge-EY, 2015) et (Crowdsurfer-EY, 2015): les prêts peer-to-peer entre individus, les prêts commerciaux P2P, le crowdfunding capital, le crowdfunding basé sur les récompenses, le crowdfunding fondé sur les dons, les mini-obligations et le commerce de factures. Cependant, toutes les méthodes ne couvrent pas tous ces instruments. L'analyse des données de plateforme n'a été appliquée qu'aux instruments qui, selon la littérature, sont les plus pertinents pour la R & I, comme l'équité, les récompenses et le crowdfunding fondé sur le don. Les mini-obligations et le commerce de factures n'ont pas été inclus dans la collecte de données en raison de leur potentiel limité de R & I, selon les interviews exploratoires et la revue de la littérature.

III. Principales constatations

Le rôle de la finance alternative pour la R & I

La valeur totale estimée des investissements en FA dans la R & I dans l'UE était d'environ 755,1 millions d'euros en 2015, ce qui représente entre 1/6 et 1/8 de la valeur totale du marché européen de la FA. Le rôle de la FA est significatif dans l'écosystème de financement européen pour la R & I, en particulier par rapport au budget d'environ 10 milliards d'euros annuels d'Horizon 2020. Cependant, si l'on considère la forte différence de taille et de taux de croissance de la FA entre l'Europe et le reste du monde, il est évident que les innovateurs européens ne bénéficient pas de la FA autant que leurs concurrents d'autres régions du monde. Le développement de la FA est très déséquilibré entre les États membres et FA pour la R & I suit la même tendance (81% du volume est représenté par le Royaume-Uni et 78,1% des projets de R & I sont basés au Royaume-Uni). En plus, les activités de R & D restent essentiellement domestiques (70% des plates-formes indiquent que le pourcentage de financement provenant de pays différents est inférieur à 20%) et moins de 10% des activités transfrontalières entre pays de l'UE (Crowdsurfer-EY, 2015).

En regardant les différents types de R & I, il semble que FA est plus approprié pour:

- 1) Étapes avancées du cycle d'innovation, où les résultats sont plus faciles à anticiper et à évaluer par le «crowd» (selon les résultats de l'étude, il y a en moyenne 3 fois plus de projets axés sur l'innovation que de recherche),

- 2) Innovation liée à l'amélioration des conditions de vie (énergie, environnement, alimentation, santé),
- 3) Initiatives moins intensives en capital (par exemple c'est moins commun pour les nanotechnologies et la recherche spatiale).

En outre, il existe une distinction claire entre les modèles de financement pour la recherche et l'innovation. Les modèles de financement fondés sur les dons et les récompenses sont surtout adaptés à la recherche fondamentale, tandis que l'équité et les prêts et récompenses sont utiles pour les étapes ultérieures du cycle d'innovation, plus proches du marché. Enfin, les projets financés par des plates-formes de financement et de prêt sont plus importants que ceux financés par des récompenses et des dons, de sorte que les campagnes d'innovation FA sont plus importantes que celles axées sur la recherche. Les projets de R & I (quelle que soit la plateforme) recueillent en moyenne plus de fonds que d'autres projets mais ont des taux de réussite plus faibles.

Plateformes et leurs business model

Le marché FA est très concurrentiel, avec un avantage évident pour les premiers arrivants. Bien que le nombre de plates-formes actives ait augmenté au fil des ans, le nombre de plates-formes créées au cours d'une année donnée a diminué régulièrement depuis 2014. La majorité des plates-formes de R & I FA est des entreprises autonomes et à but lucratif (73% des plateformes interrogées). Pourtant, la plupart des plates-formes sont relativement petites, avec un chiffre d'affaires inférieur à 500 000 euros (78% des plateformes interrogées) et, en particulier, les plates-formes orientées vers la recherche ont un problème à trouver un modèle d'affaires durable.

L'analyse de la base de données des plates-formes FA pertinentes a révélé qu'il existe en moyenne deux fois plus de plates-formes génériques que les plates-formes strictement orientées R & I. Ceci n'est pas surprenant, en prenant en considération le modèle commercial de base des plates-formes FA, qui est basé sur les frais de réussite facturés aux collecteurs de fonds et aux investisseurs en pourcentage de la somme recueillie ou investie (habituellement 5-10%). La plupart des plates-formes ne facturent aucun frais à moins que le projet soit réussi. Plus la gamme de la plateforme est large, plus la capacité d'attirer plus de projets et d'investisseurs est forte. Les principaux facteurs de réussite des plateformes FA comprennent un réseau fiable de collecteurs de fonds et d'investisseurs, offrant différents modèles FA et offrant au moins une certaine forme de mentorat pour les levées de fonds. Ainsi, le modèle de financement hybride (plus de 20% de toutes les plates-formes de R & I FA) a une importance croissante pour répondre aux besoins de divers projets. De même, le modèle de financement "Tout-ou-Rien" (ToR) domine (73% des plates-formes étudiées), perçu comme plus sûr par les investisseurs (Oxera, 2015).

Un autre facteur clé de succès mentionné est la reconnaissance nationale / internationale d'une plateforme. Ce dernier aspect est particulièrement important dans le contexte des opérations transfrontalières, perçues par les plateformes comme un moyen naturel de croissance. Toutefois, la fragmentation de la réglementation au niveau de l'UE et l'existence de régimes réglementaires différents entre les différents pays sont désignés comme les principaux obstacles aux opérations transfrontalières. Jusqu'à présent, neuf pays ont mis en place leurs propres régimes FA (Autriche, Espagne, France, Royaume-Uni, Italie, Allemagne, Portugal et plus récemment Finlande et Lituanie).

En ce qui concerne les plates-formes spécialisées dans la R & I, la majorité des plates-formes FA utilisent des modèles de financement par capitaux propres (plus de 50%) suivis de modèles de financement hybrides (24% des plates-formes). Les principales catégories de plates-formes orientées R & I comprennent: les énergies renouvelables et l'efficacité énergétique (32,5%); Innovation, start-ups et PME (32,5%); Santé et sciences de la vie (12,5%).

La faisabilité du projet et l'impact économique sont les principaux facteurs pris en compte par les plates-formes lors de la sélection des projets de R & I. Les plates-formes orientées R & I effectuent un contrôle de qualité des projets avant de les classer (généralement par le biais d'un conseil scientifique ou consultatif et selon un ensemble de critères de qualité), bien qu'il n'existe pas d'approche standard (elle diffère entre plates-formes, modèles de financement, et degré de spécialisation des plateformes FA).

Principaux défis des plateformes FA

- Plateformes: modèle commercial rentable, réseau pour l'engagement des foules, gestion des attentes de retour des investisseurs, transparence autour des investisseurs, liquidité des investisseurs, confiance des investisseurs.
- Pays: le développement des plates-formes FA est corrélé avec la maturité du marché financier alternatif, la disponibilité de la FA, la préparation culturelle et l'existence de mesures de soutien, ainsi que l'absence d'obstacles.
- Transfrontalier: fragmentation réglementaire au niveau de l'UE et existence de régimes réglementaires différents entre pays.

Les collecteurs de fonds

Les innovateurs individuels et les entrepreneurs (environ 45 à 55%), ainsi que les PME, sont les principaux bénéficiaires des financements alternatifs et de la FA pour la R & I. La portée des universités est encore très limitée. Selon les interviewés, ils ne sont pas conscients de la FA, ni trop désireux d'expérimenter avec elle.

Les principaux moteurs de l'utilisation des financements alternatifs par les collecteurs de fonds sont les mêmes pour l'ensemble de la FA et FA pour la R & I: un accès plus facile au financement; La validation du potentiel commercial du produit; et l'utilisation des plates-formes FA comme outils de marketing / canaux de communication, et comme un moyen de créer un réseau de contacts et de partenariats. Les autres facteurs mentionnés dans les collectes de fonds comprennent les intérêts personnels et la sensibilisation à la cause du projet.

Les principaux facteurs de succès de la campagne FA sont attribués à la force de la stratégie de communication: profondeur de la description du projet, fréquence des mises à jour du projet, fourniture de matériel vidéo attrayant et visuels graphiques. Pour les projets de recherche, la crédibilité des chercheurs derrière le projet est cruciale.

Les facteurs liés au projet suivent: taille de l'objectif de mise en gage et durée de la période de financement. Enfin, le choix de la plateforme appropriée, l'un avec expérience et une bonne réputation, ainsi que le modèle de financement adéquat, sont particulièrement importants pour les levées de fonds.

À l'inverse, le manque de compétences spécifiques, telles que la création d'un plan d'affaires, l'expérience de la communication, le manque de savoir-faire sur les modèles FA pertinents et leur adéquation à différents projets FA, et le manque de ressources (temps et financier). Ces facteurs pourraient être attribués à une perception générale que la FA est plus complexe et nécessite un niveau d'expertise plus élevé. Enfin, les doutes sur la crédibilité d'une plateforme et la transparence des opérations d'une plateforme empêchent les collecteurs de fonds d'utiliser des financements alternatifs.

Principaux obstacles pour les collectes de fonds

- Sensibilisation à la collecte de fonds: manque de compétences spécifiques (création d'un plan d'affaires, développement d'une communication attrayante), manque de prise de conscience de la FA et de ses modèles spécifiques, manque de ressources.
- Plateformes: crédibilité des plates-formes, transparence des opérations d'une plateforme.
- Obstacles liés au projet: complexité de l'acquisition de FA par rapport à d'autres options de financement, divulgation / droits de propriété intellectuelle (DPI).
- Écosystèmes: absence d'intégration suffisante de la FA dans le pipeline de financement.

Investisseurs

Le rôle des investisseurs institutionnels reste limité en ce qui concerne la FA pour la R & I. Les institutions n'étaient responsables que de 24% des investissements de prêts aux entreprises, et seulement 8% de l'investissement dans le crowdfunding fondé sur l'équité provient des investisseurs institutionnels en 2015 (Cambridge-KPMG, 2016). De même, les plates-formes étudiées ont déclaré qu'en moyenne, 5% des investisseurs sont des investisseurs institutionnels et plus de la moitié des plates-formes ont déclaré n'avoir aucun investisseur institutionnel enregistré. Les investisseurs professionnels utilisent les plates-formes FA pour tester le potentiel de marché des projets (dite «preuve de concept») avant de placer des investissements plus élevés en dehors des plates-formes FA afin d'éviter les frais de plateforme.

Bien que les investissements effectués dans le cadre des plates-formes FA soient motivés par des rendements financiers supérieurs attendus, ce n'est pas la seule motivation. Des facteurs tels que la diversification d'un portefeuille de placements (investissement de petits montants dans un plus grand nombre de projets) et le partage des risques, la « due diligence » et la validation du projet par le marché jouent un rôle tout aussi important. De plus, les investissements dans les projets FA sont caractérisés par le fait qu'ils sont motivés par l'émotion et les motivations personnelles (entendus comme l'intérêt direct personnel dans le sujet et les motivations philanthropiques). Il est important de noter que les investisseurs qui utilisent des modèles de capital-actions et de prêts FA investissant dans des innovations sont davantage motivés par des motivations financières. Ceux qui investissent dans les récompenses et la crowdfunding de don sont plus axés sur la finalité non lucrative, et sont donc plus enclins à investir dans la recherche fondamentale.

Outre les motivations personnelles et le rendement financier, les investisseurs tiennent compte de la taille et de la portée du projet, du stade de R & I du projet, de la composition de l'équipe et de l'efficacité de la plateforme tout en décidant d'investir dans un projet FA spécifique. En outre, en ce qui concerne les fonds propres et les prêts FA, les investisseurs préfèrent les investissements sur les plates-formes locales de financement du crédit, car les différents régimes financiers alternatifs rendent les placements transfrontaliers plus risqués en termes de connaissance du marché, de frais juridiques et de complexité des procédures de responsabilité.

Dans l'ensemble, la transparence des opérations d'une plate-forme est considérée comme un domaine prioritaire à améliorer.

Principaux obstacles pour les investisseurs

- Risques liés aux écosystèmes: fiabilité de la FA en tant que forme d'investissement et absence de réglementation.
- Risques liés au projet: aspects financiers des projets, manque de garanties, liquidité générale du marché.
- Risques liés à la collecte de fonds: manque d'expertise et de compétences en gestion.
- Risque lié aux investisseurs: pas de véritable compréhension du potentiel du produit
- Risque lié à la plate-forme: asymétrie de l'information, manipulation de la notation du crédit et vérification inappropriée des contrôles de diligence raisonnable.
- Facteurs exogènes: nouveaux acteurs du marché, état négatif de l'économie, changements réglementaires.

Écosystèmes et tendances futures

Le financement alternatif est perçu comme une source supplémentaire, plutôt que comme une alternative, à d'autres formes de financement de la R & I (environ 63% des collecteurs de fonds ont essayé d'obtenir des fonds d'autres sources avant ou pendant la FA). Les investisseurs et les plates-formes mentionnent un effet de levier pour FA. Notamment, l'obtention d'un financement initial par le biais d'une plateforme FA attire d'autres investissements des investisseurs professionnels, business angels et des institutions qui suivent la «foule». FA est considéré comme un moyen de combler l'écart d'équité qui peut être observé au stade semencier. Cependant, certains le considèrent comme un moyen de promouvoir davantage le développement, la commercialisation et la croissance de projets axés sur l'innovation.

De nos jours, les plateformes FA avec un périmètre de R & I collaborent principalement avec des accélérateurs et des incubateurs pour l'identification de projets (48% des plateformes interrogées), business angels (30%) et banques (29%). Il y a une consolidation et une institutionnalisation croissantes du secteur FA - 48% des plates-formes P2P de prêt à la consommation, 22% des prêts aux entreprises P2P et crowdfunding des actions indiquent au moins un certain niveau d'appropriation institutionnelle (Cambridge-KPMG, 2016). En effet, les acteurs historiques, comme les banques; Les investisseurs en capital de risque et les business angels canalisent leurs investissements par le biais de plates-formes FA, soit en développant des collaborations avec des plates-formes existantes, soit en créant / acquérant des plates-formes propres. Néanmoins, il est nécessaire de développer davantage les liens durables entre les acteurs des écosystèmes.

IV. Conclusions et recommandations

Les options stratégiques abordent les défis de chacune des quatre dimensions: plates-formes, investisseurs, collecteurs de fonds et écosystèmes. Il existe quatre niveaux de mesures politiques possibles: 1) l'action de l'UE en faveur de FA en général; 2) actions en faveur de FA pour la

recherche et l'innovation (FA RI); 3) actions pour FA pour l'innovation seulement, et 4) actions pour FA pour la recherche.

Afin de développer davantage les financements alternatifs pour la recherche et l'innovation, il est nécessaire de traiter les problèmes sous-jacents aux financements alternatifs en Europe dans son ensemble. De plus, si la plupart des mesures politiques sont tout aussi pertinentes pour la recherche et l'innovation, la recherche-développement bénéficiera davantage d'un soutien personnalisé supplémentaire ou de mesures spécifiques à la science en raison des barrières plus élevées et du sous-développement du marché financier alternatif à cet égard. Le tableau suivant résume les actions finales recommandées.

Tableau 1 Les actions finales recommandées

Recommandation	Description
<ul style="list-style-type: none"> Recommandations à l'appui de l'Alternative Finance en général 	
Faciliter la clarté des opérations transfrontalières pour les plates-formes FA	<p>Lignes directrices / recommandations sur la législation FA pour tous les États membres. L'UE devrait élaborer des normes minimales à inclure (par exemple la protection pragmatique des investisseurs) et des aspects à éviter (par exemple, les exigences en matière de prospectus pour les projets de moindre envergure).</p> <p>Lignes directrices sur les investissements transfrontaliers pour les plates-formes et les plates-formes de R & I, afin de mieux comprendre les différents régimes réglementaires et législatifs.</p>
Promouvoir la norme de transparence des opérations FA.	<p>Faciliter la création et la promotion du Code de conduite pour les plateformes FA. Le système d'autoréglementation facilité par l'UE pourrait renforcer la confiance entre les parties prenantes de l'écosystème.</p> <p>Promouvoir la normalisation dans la manière dont les résultats des campagnes FA sont rapportés (Indicateurs clés de performance) et des critères standard minimaux pour le processus de sélection des projets par les plates-formes FA.</p>
Création d'un centre européen d'information et de conseil en FA	<p>Un guichet unique pour FA qui fournit des services d'information sur les modèles FA pour les collecteurs de fonds et les investisseurs et leur adéquation à des projets et à des secteurs spécifiques; Organise des formations et des événements sur FA; Partage des exemples de bonnes pratiques en matière de FA, et relie les parties prenantes au niveau national et régional, entre autres.</p>
Enseignement financier	<p>Développer le cours en ligne massif ouvert (MOOC) - comme les formations sur la FA, faciliter les échanges de bonnes pratiques entre les pays, mais aussi entre les plates-formes sur la façon de sensibiliser et d'éduquer sur la FA.</p>
Exemptions fiscales au niveau national pour les investissements en FA	<p>La déductibilité fiscale des investissements dans FA au niveau national est considérée comme le moyen le plus efficace d'accroître l'adoption générale par les investisseurs. La CE a un rôle crucial à jouer, d'une part, pour encourager et soutenir l'adoption de mesures similaires au niveau national et, d'autre part, pour éviter qu'elle ne devienne un obstacle supplémentaire aux investissements transfrontaliers.</p>
<ul style="list-style-type: none"> Recommandations à l'appui des financements alternatifs pour la recherche et l'innovation 	
Approbation de la qualité des plates-formes de R & I	<p>Dépôt ouvert de plateformes scientifiques basées sur l'ensemble de critères prédéfinis spécifiques, p. Ex. Les plates-formes devraient être actives et avoir des projets actifs, ils devraient s'engager à respecter le Code de conduite et les rapports normalisés.</p>
Soutien à la préparation des campagnes FA - octroi de micro-subventions	<p>Micro-subventions européennes pour financer les coûts préparatoires d'une campagne FA en tant que solution rapide au manque de compétences en matière de collecte de fonds. Le type de coûts couverts pourrait inclure le coût des services de consultation pour la création d'une campagne réussie (services consultatifs d'un consultant FA, services de relations publiques, communication vidéo et graphique, élaboration de plans d'affaires).</p>

- Recommandations à l'appui des financements alternatifs pour l'innovation uniquement

Garantie UE	Les mécanismes de garantie des prêts gérés par la plateforme sont considérés comme un bon moyen de promouvoir des investissements plus risqués tout en minimisant les inconvénients aux niveaux national et régional.
Fonds de contrepartie de l'UE / co-investissement	Des plates-formes spécialisées sur le terrain présélectionneront des projets qui, après avoir atteint un niveau spécifique de financement de la "foule" / investisseurs professionnels, recevraient le reste des fonds de l'UE. En pratique, cela signifierait que l'UE s'engagerait à contribuer un certain pourcentage du montant annoncé (les plates-formes mentionnent 30% de la somme totale promise) ou une certaine somme dès le départ, jusqu'à un niveau convenu. Ce n'est qu'après avoir atteint ce niveau que la CE contribuerait.

- Recommandations à l'appui des financements alternatifs pour la recherche uniquement

Appui de l'UE aux plates-formes scientifiques pour des modèles économiques durables	Soutien à la création d'un conseil scientifique en: 1) ouverture d'une expertise scientifique et scientifique de la CE (base de données d'experts) pour évaluer les projets; 2) UE en utilisant un processus de présélection de projets par la "foule" pour la validation de projet; 3) exiger l'implication de la FA dans certains appels.
Éducation des institutions de recherche sur la FA pour la R & I	Un ensemble de services financiers alternatifs pour les institutions de recherche sur la façon d'utiliser le potentiel des financements alternatifs. Il devrait: inclure une explication des modèles de financement alternatifs appropriés pour la recherche fondamentale, la recherche appliquée, l'innovation; Inclure des informations sur les plates-formes existantes de R & I ainsi que du matériel de formation pour la préparation réussie de la campagne FA; Promouvoir les meilleures pratiques des pays et fournir une sélection de plates-formes pour les cas avérés. Phase pilote avec un couple d'établissements de recherche afin de promouvoir des exemples de cas réels.

Bien qu'il n'existe pas de preuves solides d'une défaillance du marché justifiant une intervention politique rigoureuse, il est clair qu'il y a beaucoup de place pour une intervention bénéfique et souple. Toutefois, pour être efficace, cette intervention nécessitera une conception minutieuse et une collaboration approfondie avec les stakeholders: la FA nécessiteront des politiques intelligentes, axées sur les données et collaboratives.

1. INTRODUCTION

This is the Final Report of the study "Assessing the potential for crowdfunding and other forms of alternative finance to support research and innovation", carried out for DG RTD in 2016.

1.1 Objectives and scope of the study

The study aims to deliver a thorough, holistic picture on the potential of alternative finance (AF) to improve access to risk finance in the EU for, in particular SMEs and midcaps, together with recommendations for action at EU level.

Alternative finance is a new and fast evolving trend. As such, there is a lack of robust statistics and therefore a need to combine a rigorous primary data analysis with extensive input from stakeholders. In other words, we need to transform quantitative and qualitative evidence such as data points, narratives and anecdotes into more robust and persuasive analysis that can be a basis to design policy initiatives. At the same time, there is the need to assess the reaction of stakeholders to the different policy ideas, and to develop new ideas together. By placing AF in the broader picture of the financing ecosystem, with the focus on research and innovation, and how replicable and scalable it is.

Taken that into consideration, the study was structured along three main objectives:

- To quantify and qualify the potential of alternative finance in Europe with regard to research and innovation;
- To identify the key bottlenecks to reach this potential;
- To recommend actions to overcome these challenges.

These three objectives regroup logically the original long list of research questions included in Annex. In addition, the study provides basic country information fiches for 43 countries.

Table 2 Overview of the objectives of the study

Objectives	Description of the main research questions	Research questions (see Annex)
Objective 1: Understanding the role of alternative finance for R&I	Quantitative evidence related to the size and dynamics of AF in terms of market, number of projects, to the type of projects involved, in terms of technology, riskiness,	A1 A5 A6 A8 A9 A11 A13 A16 A2 A3 A4 A7 A12 A18 A19 A20 A21 A22 A26 A27 A28 A29
Objective 2: Identify the challenges and bottlenecks	Qualitative and quantitative evidence on barriers, challenges, market failures, regulatory bottlenecks that hinder the full development of AF in EU, at the systemic level not at the level of individual projects	A10, A14 A17 A24 A23 A25 B2 B7 C1 C3 D1 D2 D3 D4 D5 D8 D9 E1
Objective 3: Recommend policy actions	Analysis of policy options and assessment of their implications	A15 A30 B1 B3 B4 B5 B6 C2 C4 D6 D7 D10 E2 E3 E4 E5 E6 E7 E8 E9

The EC has commissioned several studies on AF over recent years. This study is unique in terms of scope as it focuses on R&I only. As such, the primary focus of the analysis and policy recommendations is not on AF in general, but on the specific aspects relevant for R&I funding. Issues related to AF in general are included only insofar they are relevant for R&I as well.

The scope of the analysis covers all R&I themes, different AF types, and a wide geographical area.

Firstly, with regard to research and innovation, it focuses on projects whose main aim is:

- Scientific research,
- For initiatives aimed at generating products and services that address new and unsatisfied market needs, and

- For initiatives aimed at satisfying existing market needs by adopting novel combinations of services, methods and technologies, including organisational and social innovation.

In particular, with regard to research, for the purpose of the study the definition of research in accordance with the approach advocated by the Frascati Manual (OECD, 2002) has been adopted. R&D is defined as: “creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications”. With regard to innovation, according to OECD Oslo Manual (OECD, 2005) innovation is defined as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.

The analysis explicitly excludes:

- All the AF directed primarily at artistic or cultural initiatives;
- All the AF initiatives which do not entail a sufficiently creative or inventive attempt and
- All the AF initiatives of personal causes and funding, whose primary benefit is individual-specific

With regard to its thematic focus, the analysis adopts the H2020 taxonomy of R&I themes, including Agriculture & Forestry, Aquatic Resources, Bio-based Industries, Biotechnology, Energy, Environment & Climate Action, Food & Healthy Diet, Health, Information Communication Technology (ICT) Research & Innovation, Nanotechnologies, Raw Materials, Research Infrastructures, Security, Social Sciences & Humanities research, Science communication, ethics, scientific education, Space, Transport.

The study covers all kinds of AF based on the common taxonomy used by both (Cambridge-EY, 2015) and (Crowdsurfer-EY, 2015) report:

- Peer-to-peer Consumer Lending
- Peer-to-peer Business Lending
- Equity-based Crowdfunding
- Reward-based Crowdfunding
- Donation-based Crowdfunding
- Mini-bonds
- Invoice trading

However, not all instruments have been equally covered in the study, for reasons of feasibility. Peer-to-peer lending is covered only via surveys, not through the platform data analysis. Mini-bonds and invoice trading have not been included in the primary data gathering, because of their limited potential for R&I, based on the exploratory interviews and literature review.

Finally, with regard to geographic coverage, the study covers each EU Member State (MS); each country associated with COSME⁷; each country associated with Horizon 2020⁸; and Switzerland, Ukraine and Tunisia.

1.2 Methodological overview

The study is designed for supporting concrete policy development. In this context, whilst this is not a fully-fledged impact assessment *per se*, it adopts the architecture of impact assessment as described in the Better Regulation guidelines⁹ in order to help the robustness and the usability of the findings for policy purposes.

According to the “better regulation” principles, the policy conclusions need to be grounded in strict causality relations, to be identified and analysed sequentially. The first logical step aims to define the problem. This should clearly describe the current situation and consider why it is not satisfactory in the context of the policy objectives of the EC. This includes considering who are the different stakeholders affected by the problem; and assessing the magnitude of the problem.

In the context of the study, the problem definition is that alternative finance has an important role to play in fostering R&I but it could currently be underdeveloped in Europe in comparison to its

⁷ Programme for the Competitiveness of Enterprises and SMEs 2014-2020.

⁸ The EU Framework Programme for Research and Innovation 2014-2020.

⁹ The fundamental objective is “regulating only when necessary and in a proportionate manner” (European Commission, 2015).

competitors. The description of the problem is mainly included in section 2, describing the role of AF in support of R&I.

The second step aims at understanding the causes of the problem in order to make sure that policy interventions addresses the roots of the problem, such as the existence of market failures or regulatory inefficiencies. Why is alternative finance less developed in Europe? The current status of the research points to several bottlenecks for platforms, investors, fundraisers and the ecosystem, such as fragmentation and out-dated regulations, cultural barriers by innovators and scientists, a reluctance to risky investments and a lack of awareness and skills by the different players. This analysis is included in section 3 and corresponds to the second objective, the identification of bottlenecks.

The final step aims at developing policy options and recommendations and assessing their likely impact, including the "no EC action" scenario, in consultation with stakeholders and based on the lessons learnt from previous initiatives. Whilst a fully-fledged impact assessment requires significant effort in predicting and comparing the possible impact of well defined policy options, for instance through modelling and simulation, in this case a more contained effort was designed, mainly to understand the perspectives and implications for different kinds of stakeholders through interviews, focus groups and online engagement. This analysis is included in section 0.

These analytical steps are addressed through multiple methods: literature review, platform data analysis, online surveys, interviews, and stakeholder engagement.

The **desk research** has been aimed at finding evidence to answer the research questions of the study and setting a background for our research. The **literature review** screened the academic and consultancy body of evidence existing on the matter, both on issues related to access to finance in general and on alternative finance in particular. In this literature review, a structured approach to find and choose the relevant articles was applied (see Annex for list of references). The selection is broad enough to include all the relevant evidence, and narrow enough to count on a manageable number of studies. The selection of the relevant articles followed three steps: 1) setting-up the scope, the search string, and the inclusion criteria; 2) creating the databases, identifying studies; and 3) selecting the studies to be included in the review. Moreover, the study mapped 232 active European platforms with an R&I scope (generic with R&I spectrum or R&I-oriented platforms) from the list of over 550 crowdfunding (CF) platforms (see Annex for list of European platforms with R&I scope).

The **platform data analysis** is a unique methodological approach developed by the Politecnico di Milano over recent years to analyse crowdfunded projects. It is the fundamental tool to quantify the amount of alternative finance for R&I and to qualify the type of projects in terms of technological level and research domain. The strategy is based on the computerised content analysis of the project descriptions. The algorithm takes into account both the occurrence of terms indicating a certain meaning –in our case terms describing innovations, research and creative attempts–, as well as the relative frequency of these terms across the entire pool of documents. AF projects have been coded based on their being or not being directed to R&I. To perform the inherently difficult task of coding R&I projects, the algorithm was instructed using a set of documents extracted from the Horizon 2020 Work Programmes 2014-15 and 2016-17. This analysis was integrated with two additional methods: the coding provided by the platform itself (e.g. technology) and the semantic analysis based on an endogenous sample of projects included in R&I-only platforms. In total, the ten platforms analysed included 263,781 unique projects that have been launched from 2009 to 2016 by fundraisers located in 161 countries, and using six languages. Of these, 67,240 projects are from EU and affiliated countries. These EU projects raised EUR 866,726,231, which the study team estimates to be not less than 54% of the capital raised by EU projects. Two categories of platforms were explicitly excluded: i) platforms whose primary goal is not AF (e.g. websites of charity institutions, universities, or foundations that also enable only money donations); ii) platforms that do not allow campaigns from proponents located in at least some EU or affiliated countries (e.g. platforms, like Experiment.com that requires a US headquarter base as criteria for eligibility).

Two separate **online surveys** addressed platforms (survey of platforms) and fundraisers (survey of users). They aimed to complement the quantitative information from the platform data analysis with additional insight, both quantitative and qualitative. Two distinct online questionnaires have been developed – one for platforms, one for fundraisers. The latter contains separate questions for current and potential fundraisers. For AF platforms, the study team identified 234 general platforms or platforms specialised in R&I; in order to reach platform managers, email or contact information of platforms was used, and for platforms that are ECN members or associates, a dedicated single-use link to the online survey was provided. As a result of these steps 45 responses out of 234 platforms were received (19% response rate). This response rate is higher than expected from this type of survey. With regard to fundraisers, current and potential users have been reached distributing a link to the online questionnaire through the platforms involved in the project via ECN, and also distributed by the EC to their networks. As a result, the study team has gathered 55 answers, 16 from current and 39 from potential fundraisers. In total, the surveys gathered 100 responses.

With regard to **interviews**, in total the study team performed 60 interviews aimed at gathering in-depth qualitative insights and feedback from key stakeholders active in the field of CF and alternative finance in support of R&I. Interviews have been carried out with national regulators, user/fundraisers, investors, platforms and innovation eco-system players. Detailed interview guidelines were elaborated for each stakeholder group during the inception phase and validated by the European Commission (EC). Based on interviews and desk research, the study also produced ten case studies.

On top of this, the study delivered extensive **stakeholder engagement**, through: 1) the website crowdfunding4innovation.eu and social media presence; 2) four focus groups aimed at investors, fundraisers, platforms and ecosystem players, and 3) the final European Policy Workshop.

The table below summarises which different research questions were addressed by each method.

Table 3 Overview of the methods to be used for each objective

	Main questions	Desk research	Platform data analysis	Interviews	Cases	Survey of platforms	Survey of users	Focus groups	Workshop	Online engagement	Country corr.
1. Role of AF for R&I	Size										
	Uptake										
	Type										
	Dynamics										
2. Challenges and bottlenecks	Demand										
	Supply										
	Platform										
	Ecosystem										
3. Recommendations											

In summary, our methodology includes:

- Desk research: over 260 literature sources used & an online database of 232 platforms was created.
- Platform data analysis: 263,781 unique projects from 10 platforms were analysed.
- Surveys: 55 surveyed platforms and 45 users (current and potential fundraisers).
- Interviews: 60 interviews with investors, regulators, fundraisers, platforms and eco-system players.
- Case studies: 10 cases (eight on project & two on platforms).
- Stakeholder engagement through:
 - Focus Groups: 4 FGs (investors, platforms, fundraisers, eco-system players).
 - European Policy Workshop (attended by 26 stakeholders).
 - Website (presenting country fiches and database of platforms with R&I scope), blog and social media activity.

1.3 Content of the report

The report is structured alongside the objectives of the study (role of AF, bottlenecks, policies), which are consistent with the logical framework of the Better Regulation approach (problem-drivers-policy options). Hence, the next chapter defines and assesses the problem, i.e. the overall role of AF in funding R&I, in both qualitative and quantitative terms. Chapters 3 to 6 address the causes of this problem, in terms of the different challenges of platforms, fundraisers, investors and overall ecosystem issues. Based on this analysis, chapter 0 presents policy recommendations developed in consultation with stakeholders.

Each section is introduced by a summary of key findings. In the course of the study, it became clear that research and innovation funding follow two fundamentally different patterns. Therefore, where possible, the findings have been divided between Research- and Innovation-related.

2. THE ROLE OF ALTERNATIVE FINANCE FOR R&I

This section analyses the quantitative and qualitative role played by AF for R&I, in order to understand to what extent AF can help overcoming the current challenges to funding R&I in Europe. The first section presents the quantitative findings on the amount of funding, mainly based on the platform data analysis. The second section describes what kinds of projects are funded, based mainly on surveys and interviews.

Key findings of the section:

- AF in Europe is growing but more slowly than in other regions and its pace of growth is slowing down whilst others are accelerating. The P2P lending model is the dominant AF model (72% of AF EU market in 2015).
- Total value of AF investment in R&I in the EU is estimated at about EUR 755.1 million in 2015, which constitutes between 1/6 and 1/8 of the total European alternative finance market in 2015 (EUR 5.4 billion (Cambridge-KPMG, 2016) or EUR 4.2 billion (Crowdsurfer-EY, 2015)).
- The development of AF and AF for R&I is very unbalanced between Member States (81% of the volume is represented by the UK and 78.1% of the R&I projects are based in the UK).
- AF remains mostly domestic (70% of the platforms indicated that the percentage of funding coming from a different country is less than 20%) and less than 10% of cross-border activity happens between EU MS (Crowdsurfer-EY, 2015).
- There are, on average, 3 times more innovation-oriented projects than research-oriented ones (AF is more suitable when the project outcome is closer to market).
- Projects on equity and lending platforms are bigger than those on rewards and donation platforms. R&I projects (regardless of the platform) on average raise more funds than other projects.
- AF is more effective for:
 - 1) Later stages of the innovation cycle, when the results are easier to anticipate and evaluate by the "crowd",
 - 2) Innovation related to life-conditions improvements (energy, environment, food, health),
 - 3) Low capital-intensive initiatives (for instance, not for nanotechnology and space research).
- Donation and rewards-based funding are mostly suitable for research; whilst equity and in part lending are useful for later stages of the innovation cycle, closer to markets.

2.1 Estimating AF funding for research and innovation

Access to finance is notoriously one of the main challenges for European companies, particularly for those that are smaller, younger and more innovative (European Commission, 2015h).¹⁰ Failure rates for innovative companies are often very high and innovative firms have riskier business models that are difficult to value. As a result, banks are less willing to lend them money and they are being perceived as riskier investments. Whereas the total estimated SME financing gap in the US ranged from 2.30% to 3.78% of the GDP in 2013, in Europe it reached the level of over 4.7% to 20.3% of GDP (6.71% - 20.3% for the NL SMEs and 6.18% - 17.07% for SMEs in Romania) (Silanes et al., 2015). Overall, the total SME financing gaps for European countries were three to five times bigger than for the US. Furthermore, the loan gap for SMEs in Europe is much higher than the equity gap, suggesting that European SMEs have much less alternatives in debt financing than traditional banking models.

Innovative companies have much more limited access to business angels and venture capital (VC) than their US counterparts. For instance, business angels in the US invested EUR 19.9 billion in SMEs in 2014 compared to only EUR 5.5 billion in Europe (EBAN, 2014). The private equity and VC sector is also less developed in Europe.

¹⁰ According to the recent ECB SAFE Survey: October- March 2016, 10% of SMEs declared it as an issue.

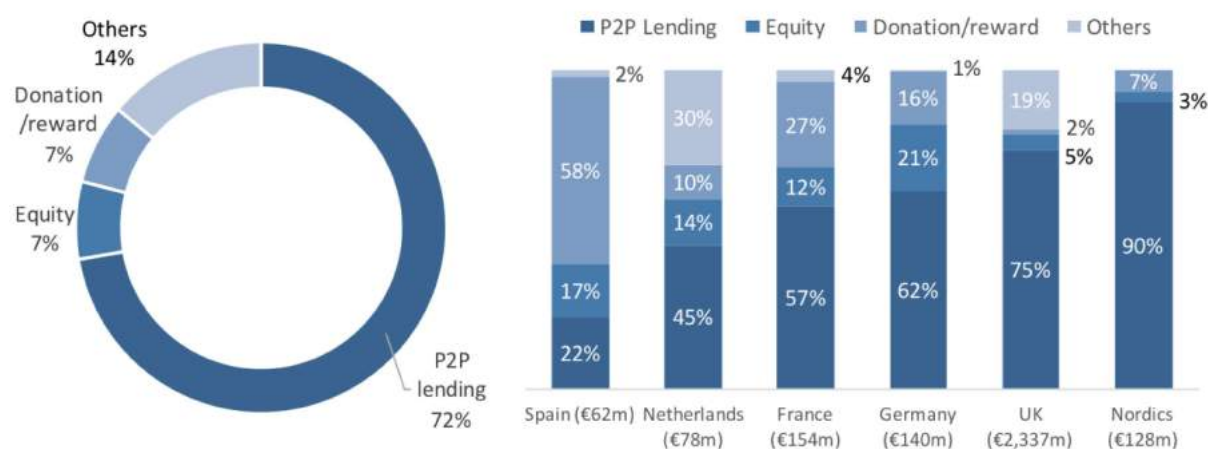
Alternative finance can play an important role in helping to fund innovative companies. In particular, alternative finance solutions can support innovative start-ups and high growth SMEs in their early growth as well as when they want to scale-up. Estimating how much of AF goes to R&I in Europe and for what purposes is a first necessary step to understand the need for policy action.

However, quantifying a fast developing trend such as AF is notoriously challenging, and overall market estimates put forward by research reports vary significantly (for instance, as illustrated below, the total value of AF in the EU varies from EUR 4.2 to 5.4 billion depending on the reports). This difficulty is further enhanced when looking at the share of funding going to R&I, which despite the progress in achieving standard definitions remains a vague concept. This section provides a quantitative assessment of the role of AF for R&I. After a brief summary of existing data on the overall market, it presents overall investment raised on R&I by different platforms, trends over time, and geographical distribution including cross border investment. The data is mainly taken from the platform data analysis and the survey of platforms, triangulated with the existing literature.

2.1.1 SIZE OF THE ALTERNATIVE FINANCE MARKET WORLDWIDE

The estimation of the AF market relies mainly on commercial research reports that use different methods and have different degrees of reliability. In 2015, the European alternative finance market was worth about **EUR 5.4 billion according to the University of Cambridge "Alternative Finance Industry Report"** (Cambridge-KPMG, 2016), for which 367 European platforms from across 32 countries were surveyed representing 90% of the market. In the study, market size is meant as the total volume of transactions raised only by Europe-based platforms, regardless of whether or not beneficiaries are located in Europe. The EC-funded study, carried out by Crowdsurfer Ltd. and EY propose a total value of **EUR 4.2 billion** (Cambridge-KPMG, 2016). Unlike the (Cambridge-KPMG, 2016) report, the (Crowdsurfer-EY, 2015) report gathered project-level data (for 2013 and 2014) from both European and non-European platforms. For the latter, only projects located in the EU were counted.

Figure 1 Breakdown of the European alternative finance market by model, 2014



Source: Elaboration by Authors on (Crowdsurfer-EY, 2015) data (left) and (Cambridge-EY, 2015) data (right). Note: "Nordics" are Denmark, Finland, Iceland, and Norway.

There is consensus that Peer-to-Peer (P2P) lending is the dominant alternative finance model globally. In Europe, as well, P2P lending is the main model, accounting for about 72% (see Crowdsurfer-EY, 2015) of the total amount raised. However, by looking at individual countries, there is a substantial variation, from 22% in Spain to 90% in the Nordic countries (Figure 1). **Equity-based crowdfunding** amounted to **EUR 104.8 million**, or about 6.7% of the total alternative finance market. Donation- and rewards-based crowdfunding were worth about 0.6% and 6.4% (respectively) of the whole alternative finance market, according to Crowdsurfer-EY, 2015. Related to P2P lending is the invoice trading funding model, through which SMEs sell their invoices or receivables at a discount to individuals or institutional investors. In Europe, invoice trading accounted for 13.3% of the entire alternative finance market in 2014, according to (Crowdsurfer-EY, 2015).

According to the latest estimates from (Cambridge-KPMG, 2016), the European market grew from EUR 1.13 billion in 2013, to 2.83 in 2014 (+151%), to 5.43 in 2015 (+92%). This contrasts with the accelerating growth rate of the Americas (+248%) and Asia/Pacific (+366%). It is worth noting

that the original forecast for 2015 from the (Cambridge-KPMG, 2016) report 2015 was EUR 7 billion, whilst the actual number amounted to 5.43. In other words, AF in Europe is growing, but it is smaller than other regions, growing at a slower pace, with the pace of growth slowing down whilst others are accelerating.

Figure 2 Market data 2013-2015 (Billion Euro)



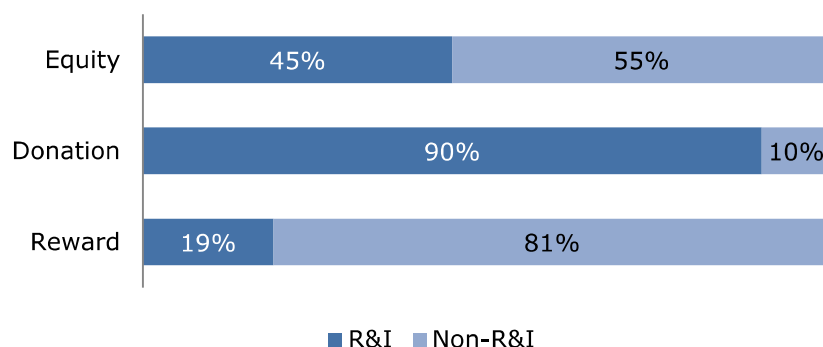
Source: Adapted from (Cambridge-KPMG, 2016)

2.1.2 ESTIMATING THE SHARE OF THE AF GOING TO R&I

In order to estimate the share of the AF that goes to R&I, the study relies on the triangulation of AF market estimations based on (Cambridge-KPMG, 2016) report for Continental Europe and (Cambridge-Nesta, 2014) report for UK, of the findings from the platform data analysis, and of the survey of platforms.

From **platform data analysis**, the total amount raised at the EU level during 2015 that goes to R&I corresponds to about EUR 163.7 million, or 28.7% of the respective sample. When broken down by type of platform, R&I accounts for about 19% of projects in rewards-based platforms, for about 90% of projects in donation-based platforms, and for about 45% of projects for equity-based platforms (Figure 3). The data also inform about how many projects focus on research only (about 21% of all projects) and how many focus on innovation only (about 62% of all projects).

Figure 3 Share of crowdfunding going to R&I, by type of platform



Source: Platform data analysis

According to the (Cambridge-KPMG, 2016) report, in Continental Europe the alternative finance market for equity-based, donation-based, and rewards-based platforms in 2015 was worth about EUR 159.3 million, EUR 21.7 million, and EUR 139.3 million respectively. From the (Cambridge-Nesta, 2014) report, the UK alternative finance market for equity-based, donation-based, and

rewards-based platforms in 2015 was worth about EUR 337.5 million, EUR 16.5 million, and EUR 57.9 million respectively. The conversion to Euro was obtained by applying the ECB reference exchange rate.¹¹

Assuming external validity of the results, we could estimate the size of alternative finance for R&I in equity-based, donation-based and rewards-based platforms by applying the ratios above to the market size as computed by (Cambridge-KPMG, 2016) for Continental Europe and (Cambridge-Nesta, 2014) for the UK. However, whilst the reports estimate the market value at a given year, our data broken down by platform refers to an aggregate 2009-2016. Yet the information on the share of funding going to R&I for all platforms (about 28.7% of funding) presented above, for which yearly data is available, has remained stable in the past years.

Figure 4 Share of crowdfunding going to R&I, 2013 to 2016



Source: Platform data analysis

Making the further assumption that the share of R&I for equity-based, donation-based and rewards-based platforms has likewise remained unchanged over time, and assuming constant ratio external validity of the results, it is possible to estimate the amount of funding in different types of platforms. It could be therefore argued that the size of alternative finance for R&I activities in 2015 in Continental Europe amounted to about EUR 71.7 million in equity, about EUR 19.5 million in donations, and about EUR 26.5 million in rewards; and that in the UK, it amounted to about EUR 151.9 million in equity, about EUR 14.9 million in donations, and about EUR 11.0 million in rewards.¹²

The results are triangulated with the outcomes of the platform survey. According to the latter, which uses a different sample and a different methodology, about 50,5% of the amount raised through alternative finance in 2015 goes to R&I. It is worth pointing out that such estimation is likely to be affected by sample selection bias, that is, the non-randomised selection of observations that undermines the representativeness of the population intended to be analysed.¹³

The figure changes significantly when broken down by type of platform. The share for R&I is very high in equity platforms (about 70.3% of the total raised), but negligible in donation and rewards platforms (about 13.2% of the total raised). The survey of platforms also gives an additional piece of information missing from the platform data analysis, that is the share of R&I on P2P lending platforms. For P2P lending platforms, the share for R&I is about 15.1% of the total raised in 2015.

From the survey of platforms data, the total raised in 2015 that goes to R&I (50.5%) can be further broken down into the amount that goes only to research projects (about 8.4% of the total raised) and the amount that goes only to innovation projects (about 42.0% of the total raised). By

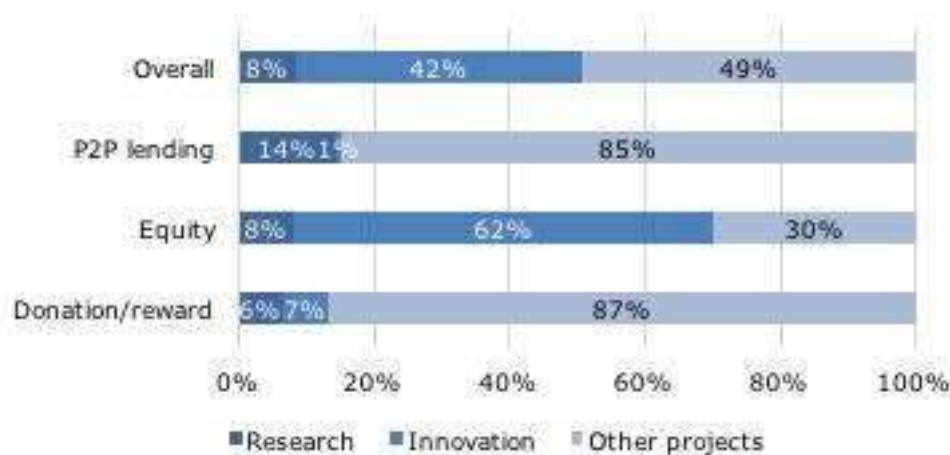
¹¹ UK pound sterling to Euro, 2015 average, available at http://sdw.ecb.europa.eu/browseTable.do?node=9691296&SERIES_KEY=120.EXR.A.GBP.EUR.SP00.A , retrieved 10 October 2016

¹² Figures obtained via platform data analysis are computed as the average of three different methods, including the use of Bayesian machine learning approaches that build on a training set of heavily R&I-focused sources. Furthermore, breakdowns are not limited to 2015 but show an aggregate of projects from 2009 to 2016 included, therefore keeping into account projects at a time when alternative finance, with focus on innovative projects, was not yet developed. As a consequence, the figure might under-estimate the incidence of R&I projects.

¹³ The survey of platforms questionnaire was sent via email to 234 platforms, regardless of the extent of their R&I orientation – with the sole exclusion for those platforms focused on radically different fields (i.e. film industry). Yet it can be argued that R&I-oriented platforms were keener to take the survey than those platforms with little focus on R&I. It comes with no surprise, then, that of the platforms included in the sub-sample, the surprisingly high share of 38% is “specialized in R&I activities”. As a consequence, the 50.5% of the total raised that goes to R&I could discount the over-representativeness of R&I-oriented platforms.

looking at individual platform types, innovation trumps research in equity platforms (62.0% and 8.0% respectively). The opposite is true for P2P lending platforms, in which research projects make up about 14.3% of the total raised, whereas innovation projects amount to only 1.0% of the total raised. In donation and rewards platforms, the amount raised for research and innovation projects is similar (about 6.5% and 7% of the total raised, respectively).

Figure 5 Share of alternative finance going to Research and Innovation, by type of platform



Source: Elaboration by Authors on data from the survey of platforms

In conclusion, by applying the ratio to the market size as computed by (Cambridge-KPMG, 2016) for P2P lending platforms (about EUR 577.9 million) and by (Cambridge-Nesta, 2014) (about EUR 2.5 billion, with the exclusion of real estate crowdfunding), we can estimate that about EUR 87.3 million went to R&I in Continental Europe, and about EUR 372.4 million went to R&I in the UK for P2P platforms. By adding them up to the previous six computations and assuming external validity, it is therefore possible to argue that in 2015, the size of the alternative finance for R&I activities ranged around EUR 205.0 million in Continental Europe, and around EUR 550.1 million in the UK, for an aggregate of about **EUR 755.1 million** (Table 4).

Table 4 Quantitative estimates of AF funding for R&I

	Total value, Cont. Europe (EUR million)*	Total value, UK (EUR million)**	R&I (%)	R&I, Cont. Europe (EUR million)*	R&I, UK (EUR million)**	R&I (EUR million)
Equity	159.3	337.5	45.0%***	71.7	151.9	223.6
Donation	21.7	16.5	90.0%***	19.5	14.9	34.4
Rewards	139.3	57.9	19.0%***	26.5	11.0	37.5
P2P lending	577.9	2,466.1	15.1%****	87.3	372.4	459.6
Total				205.0	550.1	755.1

Source: Elaboration by the Authors from Cambridge-KPMG, 2016 (*), Cambridge-Nesta, 2014 (**), Platform data analysis (***), Survey data (****)

To put this into perspective, Horizon 2020 has an annual budget of approximately EUR 11,5 billion¹⁴, hence AF is already playing a significant role in funding European R&I. Whilst this data

¹⁴ The total Horizon 2002 amounts to EUR 80 billion for 7 years.

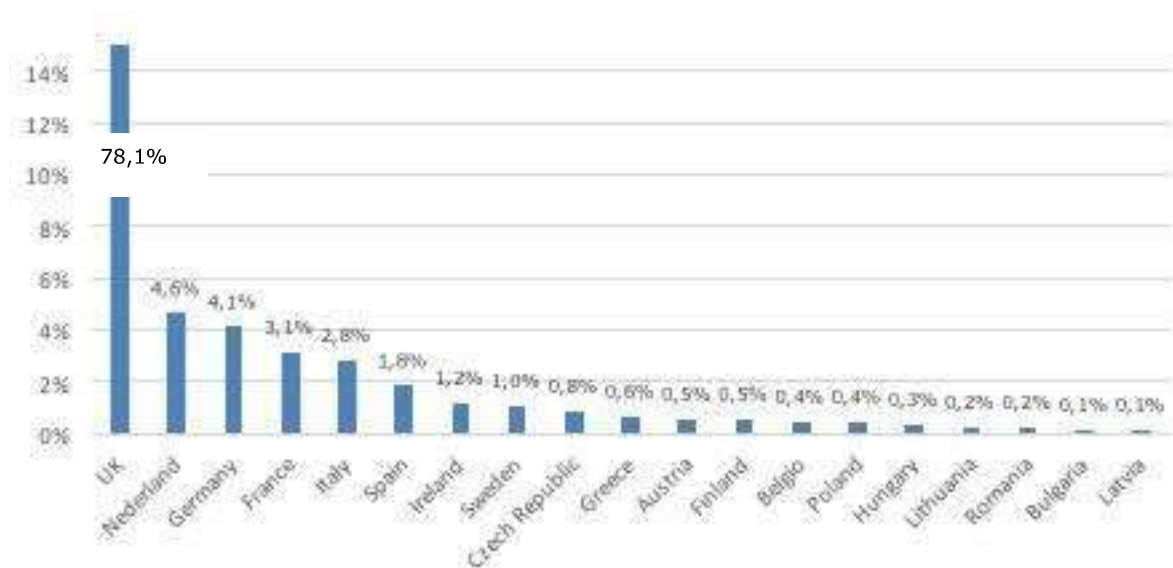
shows that AF is playing an important role in funding innovation, by considering the strong difference in size and growth rate of AF between Europe and the rest of the world,¹⁵ it is clear that European innovators are not benefiting from AF as much as their competitors from other regions of the world.

2.1.3 GEOGRAPHICAL DISTRIBUTION AND CROSS-BORDER DIMENSION OF AF FOR R&I

When looking at differences between Member States, **AF shows a very unbalanced geographical development**, with the UK accounting for about 81% of the overall European market in 2015 (Cambridge-KPMG, 2016). This divide is still growing as the UK market grew 84% in 2015 in comparison to 72% for the rest of Europe. The second largest country by total raised is France, with about EUR 319 million of funding in 2015, corresponding to 5.9% of the EU total and about 31.3% of Continental Europe total. Platforms based in Germany raised about EUR 249 million in 2015, corresponding to 4.6% of the EU total and to 24.4% of the Continental Europe total. The Netherlands (about EUR 111 million, 2.0% in EU, 10.9% in Continental Europe), Finland (about EUR 64 million, 1.2% in EU, about 6.3% in Continental Europe), and Spain (about EUR 50 million, 0.9% in EU, 4.9% in Continental Europe) follow according to the (Cambridge-KPMG, 2016) report.

In view of the strong concentration of AF in the UK, it comes as no surprise that the distribution of R&I projects is equally concentrated there. Considering the distribution across the EU-28 countries of the 6,656 R&I projects based in Europe, **most of the European R&I projects are based in the United Kingdom** (namely 4,921 projects out of 6,656; 78.1%). The number of R&I projects in the other EU countries is much lower (see Figure 6). For instance, the Netherlands, Germany, Italy, and France, which rank respectively second, third, and fourth in number of R&I projects, respectively account for only 4.6% (NL), 4.2% (DE), 3.1% (FR) and 2.8% (IT). Amongst non-EU countries included in the study, there are no projects in Albania, the Former Yugoslav Republic of Macedonia, Malta, Montenegro, Serbia and Turkey.

Figure 6 Number of European projects by country



Source: Platform data analysis

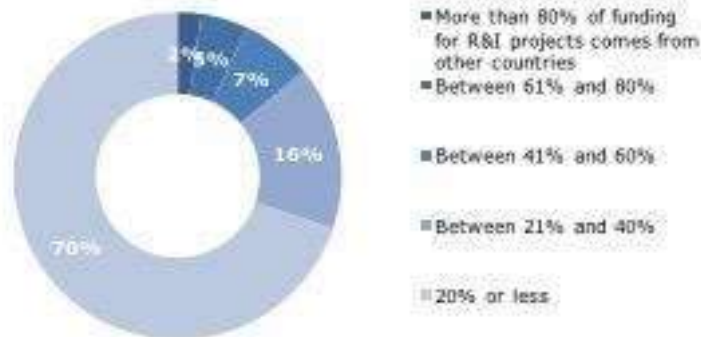
Alternative finance remains mostly domestic. Many European platforms are still working in one language, and as highlighted by the (Cambridge-KPMG, 2016) report, local AF prevails as cross-border transactions remain limited in proportions: 77% of platforms have less than 10% funding coming from investors from another country, and 92% have funding going to fundraisers in other countries. Cross-border activity is found in small countries, with limited domestic markets. Moreover, according to the (Crowdsurfer-EY, 2015) report, most of the cross border activity took place on non-EU platforms operating within the EU, and EU platforms operating outside the EU:

¹⁵ While analysing non-EU data is beyond the scope of this project, our platform data analysis report “innovation intensity” rates at global level in line with the EU average, if not slightly superior.

less than 10% of cross-border activity happened between EU MS. There is no data specifically on R&I funding.

The data from our study confirms this trend also specifically for R&I. **The vast majority of platforms (70%) indicated that the percentage of funding coming from a different country is less than 20%** (Figure 7).

Figure 7 Cross-border transactions



Source: Survey of platforms, Typically, in research and innovation projects, what is the percentage of funding coming from a different country than the one your platform is established in (cross-border)?

When it comes to donation and rewards ventures, the participants in the focus groups reinforce this message pointing out that geographic proximity matters, and donors are more likely to invest in local projects.

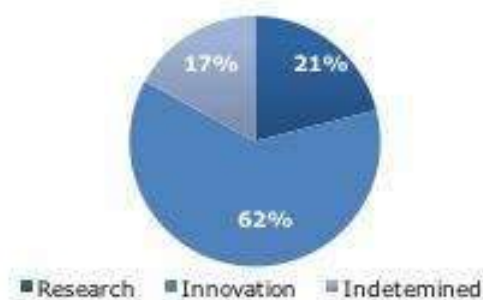
2.2 Typologies of R&I funded by AF

One of the main goals of the study is to spread light into how AF can support research and innovation. Each funding instruments brings about different advantages for different types of project. For this reason, this section analyses the different roles of AF alongside some fundamental aspects of innovation: the stage in the innovation cycle (from basic research to commercialisation), the size, the thematic focus and the level of riskiness.

2.2.1 BREAKDOWN BETWEEN RESEARCH AND INNOVATION

The large majority of the R&I projects (62%) pertain to the *Innovation* category, whilst only 21% belong to the category *Research* (Figure 8). These results shed further light on the idea sketched by (Colombo et al, 2015b), that using AF for financing projects of (basic) research is far from simple. Indeed, as the authors have noted, AF is more suitable when the project outcome is a ready-to-use product that can be offered in exchange for the pledge. This makes **AF more suitable for innovation projects, which are close to market delivery**, but calls into doubt the suitability of AF as a means for funding basic research.

Figure 8 Research versus Innovation in R&I projects – European projects



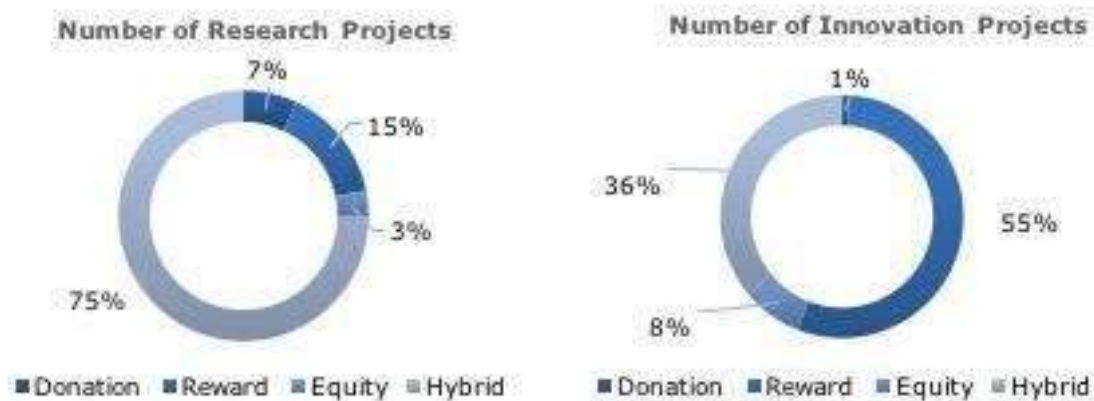
This data is confirmed by the results from the survey of platforms, which report that, on average, the share of basic research projects is 16% of the total projects, whilst the share of applied research and innovation projects is 42% of the total projects. Similar results are also found in the survey of users, which report that 28% of the projects are dedicated to basic research, whilst 72% are for later stages of the innovation cycle. In short, there are on average three times more innovation-oriented projects than research-oriented ones.

The qualitative analysis confirms this and provides further insight. Overall, a large part of interviewees (36%) argued that CF and alternative finance have stronger potential with regard to innovative projects, only 3% of interviewee stated that AF has a higher potential for research projects, whilst 23% of stakeholders claimed that AF has an equal potential for both sectors. 48% didn't express any opinion.

Nevertheless, whilst elaborating their answers, most respondents pointed out that the differences in the potential for research and for innovation projects depend also on the AF model considered.

The platform analysis shows that innovation projects are mainly funded through rewards-based platforms. Research projects are mainly funded through hybrid platforms. A difference exists with regard to donation and equity platforms. Comparatively, equity platforms are selected more often for innovation projects (8% for innovation projects, 3% for research projects), whilst donation platforms are preferred in relation to basic research projects (1% for innovation projects, 7% for research projects).

Figure 9 Different funding patterns of innovation and research projects



Source: Platform data analysis

Interviewees shed further light on this differentiation. Concerning innovation projects and the higher potential of AF in this area, the majority of stakeholders adduced that the potential of AF as a financing method is closely linked to the level of understanding of the project being promoted. Innovation projects imply that fundraisers can show a prototype or a physical product to the "crowd" and to investors, meaning that they will have more chance to understand the product and hence to finance its production. *"If you have a physical good and you already can show a prototype, it is something easier to understand. If you have a service or something that you have to imagine obviously is more complicated"*, said a Finnish Investor.

As far as research is concerned, interviewees argued that AF for research and science has potential mainly for those projects that have a philanthropic scope (e.g. research to fight cancer or degenerative diseases, etc.) and that resort to a donation and rewards AF model.

Finally, few interviewees could not see any potential for AF to support R&I, pointing out that, in order to be financed, a project needs to be understood, well communicated, implemented and launched on the market in a limited period. *"I think that the technological sector is facing a hard time with equity CF, because there are very few people that understand what innovators do,"* said an investor. Starting from this argument, some stakeholders defined R&I as a niche market in which people do not always understand very easily if the final product is reliable and feasible.

In conclusion, whilst AF seems more relevant for innovation rather than research projects, different mechanisms are relevant for different contexts. A more complete analysis requires considering other aspects, such as the application sectors in the next paragraph. An integrated response is therefore provided at the end of this section.

2.2.2 APPLICATION SECTORS

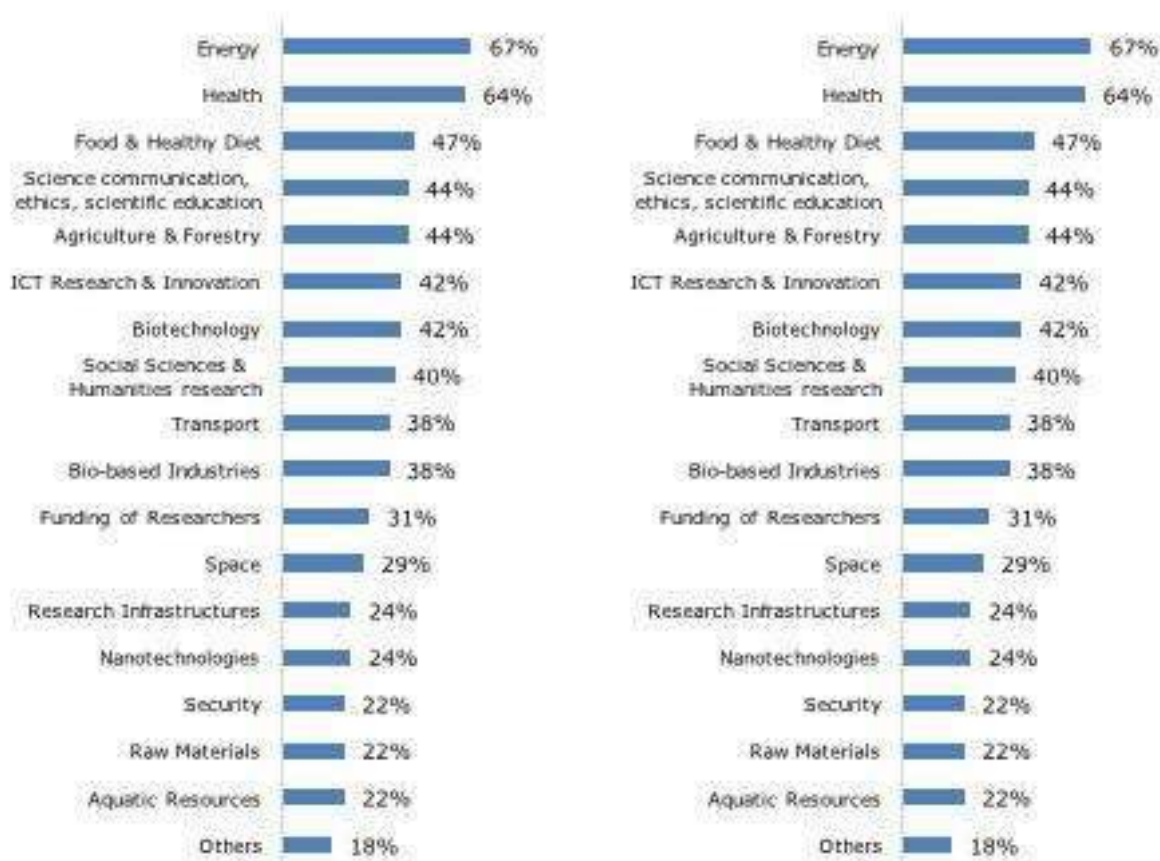
AF is relevant for a wide variety of sectors. Bearing in mind the H2020 taxonomy, the majority of interviewees think that overall AF is appropriate to finance SMEs active in R&I, independently of their application domain. Although AF is relevant for a wide variety of application sectors, several sectors are named as more suitable.

Previous research (Osimo et al, 2015) shows for instance that health-related research is a particular priority. **Energy, environment, food, health and Information Innovation Technology are consistently the most frequently domains mentioned** by surveyed platforms and users, by interviewees, and by the platforms analysis.

Perhaps surprising, is the relatively frequent mention of themes such as science communication and social science.

These rankings are largely confirmed by the interviews. In particular, several investors stated that when they have to decide where to invest their money, their choices are often driven by the research of personal benefits and in particular by the willingness to improve their life conditions: this is why sectors such as Health, Food and Healthy Diet but also ICT are seen as of the most successful to be funded via AF.

Figure 10 Project funded fields according to platforms (left) and users (right)



Source: Survey of platforms. Does your platform fund projects in the following fields? Select all that apply (n=42)

Source: Survey of users. Does your project belong to one or more of the following fields? Select all that apply (n=62)

Some platforms think that the "crowd" is usually driven by feelings and emotions and this would be the reason why people are usually keen to invest their money in projects and domains connected with their personal beliefs and their conscience such as Environment and Climate Actions, Ethics and Scientific Education.

In addition, interviews are in line with the results of the surveys in stating that highly specialised and capital intensive sectors such as nanotechnologies, advanced manufacturing or space, are not appropriate for AF. This is because projects in these domains are usually too complex to be well understood by the “crowd”. Some interviewees considered important that projects have a short period of return on investment and were sceptical at the possibility of funding via AF sectors characterised by long-term investments such as the Bio-based industry or Aquatic resources. The founder of life-science AF platform Cell Capital mentioned that *“low capital intensive initiatives could have a higher success rate because of the emotional image “young entrepreneurs without anymore funding” is created. Additionally, the investors get more equity as these tend to be early stage technologies.”*

Besides the H2020 taxonomy, other application domains considered as appropriate to be funded via CF or alternative finance by interviewees are Sport, Smart cities, Chemicals, Nuclear power and Third-world infrastructures.

2.2.3 RISKINESS OF AF

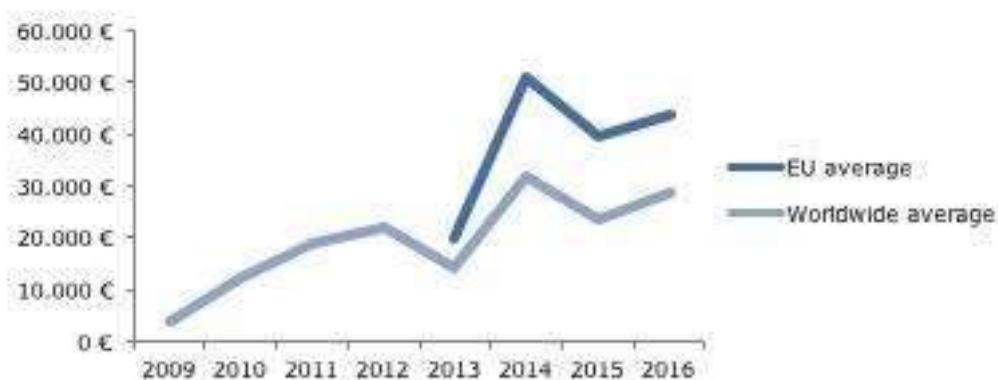
A key issue regarding alternative finance is to what extent it fills a market gap by providing funding for ventures that do not meet the standards of traditional financial instruments, for instance because they entail high risk/high reward types of initiatives. If this is true, the political importance of alternative finance is due to be even greater than expected in addressing the access to finance issue of EU business. At the same time, high riskiness of investment would pose new regulatory challenges for a sector that is not as regulated as traditional financial investment.

Indeed, studies mentioned in the EC Communication, report that AF investments do not have higher failure rates than traditional investments.¹⁶ Considering project success rate as an indicator of risk, as shown in section 3.1, R&I projects show far lower success rates than other projects, possibly due to their higher risk profile.

2.2.4 SIZE OF AF R&I PROJECTS

The typical size of funded projects is small. Data from the platform data analysis shows that R&I projects on average raise more funding than other AF projects, but the average remains low (EUR 23,958 for R&I projects vs. EUR 8,136 for non R&I projects) and research projects are smaller than innovation projects.¹⁷ This trend towards small projects is confirmed by the results from the survey of platforms, where 40% of the platforms declare that the average funding is below EUR 20,000. Whilst different, both data sets suggest that the typical R&I projects are very small scale, and more suitable for non-capital intensive initiatives.

Figure 11 Trend in average funding size for R&I project (€ / years)



Source: Platform data analysis

16 The (European Commission, 2016) reports that “The study from Nabarro and AltFi Data shows that 20% of the 367 UK businesses that attracted investment through five major equity crowdfunding platforms between 2011 and 2013 were no longer trading as of November 2015. At the same time, the study shows that investments through crowdfunding platforms do not seem to underperform other benchmark investments. In the United Kingdom, a 2014 study by the insurer RSA suggested that 55% of SMEs fail in their first five years of existence. Furthermore, a 2009 Nesta report suggested that 56% of angel investments failed to return capital.”

17 This is further supported by the findings of (Schäfer et al., 2016) where 64.8% of strictly research projects targeted amounts of up to USD 5,000.

Yet, upon closer look, the landscape becomes more complex and interesting. This data refers to the overall sample of projects analysed from 2009 to 2016. When looking at trend data (see Figure 11 above), one can see a clear growth trend over the years, as also reported by market reports on overall AF. This suggests that AF is becoming more mature and professionalised, ready for greater impact on the R&I market. Figure 11 shows this growing average project size, reaching more than EUR 40,000 in 2016.

There is also a strong differentiation between different types of funding, and between research and innovation.

Projects on equity and lending platforms are bigger than those on rewards and donation platforms. On average, the donation and rewards-based platforms declare that they host projects raising around EUR 10,000 and single investments oscillating between EUR 50 to 100. In contrast, the lending and equity-based platforms raise EUR 50,000 - 500,000 per project, the average investments are between EUR 100 and EUR 1,000 (depending if professional investors place co-investments).

The amounts raised through equity platforms are higher than those raised by hybrid and reward platforms. According to platform data analysis, equity funding average is bigger than rewards and donation. In particular, equity funding has grown strongly over the years, and in 2015 the average equity deal in our analysed platforms was EUR 127,654.26.¹⁸

Table 5 Average size of R&I funding between different instruments (EUR)

	Research	Innovation
Donation	14,476.3	17,856.5
Reward	24,556.3	35,949.6
Equity	32,873.9	46,762.4

Source: Platform data analysis

In addition, the platform data analysis reveals that the percentage of the amounts raised by European projects through equity platforms is higher than the share of projects (7% vs. 5%) and therefore the amounts raised through equity platforms are higher than those raised by hybrid and rewards platforms (EUR 46,700 vs. EUR 35,900 EUR and EUR 32,100 respectively).

2.2.5 TYPE OF AF FUNDING FOR TYPE OF R&I

The evidence suggests that AF in general is more effective for:

- Later stages of the innovation cycle, when the results are easier to be anticipated and evaluated by the "crowd".
- Innovation related to life-conditions improvements (energy, environment, food, health).
- Low capital-intensive initiatives (for instance, not for nanotechnology and space research).

However, a more accurate analysis provides an additional layer of complexity. Donation and rewards-based funding are mostly suitable for research according to data as well as to interviewees; whilst equity and in part lending are useful for later stages of the innovation cycle, closer to markets. We can summarise the funding in the chart below.

Figure 12 AF instrument per innovation stage¹⁹

	Basic research	Applied research	Prototype	Commercialisation
Donation	✓✓	✓✓		
Rewards	✓	✓	✓	✓✓

¹⁸ Though (Cambridge-KPMG, 2016) confirms the difference between amounts raised by two categories of platforms, it reports the average amount of funding being raised by equity-based crowdfunding around EUR 450,000.

¹⁹ As indicated above, we haven't found evidence in the literature nor in the interviews about the specific role of invoice trading and mini-bonds for R&I, hence they have not been included in this analysis.

Equity			✓✓	✓✓✓
Lending			✓	✓

Source: Authors' elaboration

In conclusion, whilst it is true that AF tends to fund projects more advanced in the innovation cycle, related to life-conditions improvement and low capital intensive, it is also true that because of the natural open-endedness of the instruments, projects on any research domains can be found in AF platforms.

3. PLATFORMS

This section presents the results of the desk research of AF platforms for research and innovation performed during the course of the study. The results are cross-matched with the results of platform data analysis, the survey of platforms and evidence from literature.

The underlying goal is to understand to what extent the proliferation of platforms is still ongoing, and the different choices in terms of niche and business model selection. On the other hand, the goal is also to understand what the barriers are that platforms are experiencing to grow further.

The first section presents the descriptive insight about the functioning of platforms, their number and business models. The second section analyses the challenges and bottlenecks that platforms face, based on stakeholder feedback. These bottlenecks will then be addressed by the policy recommendations in the final chapter.

Key findings of this section:

- Although the number of active platforms is growing over the years, the number of platforms founded in a specific year has been steadily decreasing since 2014.
- There are two times more generic platforms with some R&I scope than R&I-oriented
- 79% of registered platforms are using only one funding model, but the importance of the hybrid funding model is growing (adopted by over 20% of platforms).
- The major categories of R&I-oriented platforms are:
 - 1) Renewable energy and energy efficiency (32.5%),
 - 2) Health & life sciences (12.5%),
 - 3) Innovation, start-ups and SMEs (32.5%).
- Business model of AF platforms relies on the success fees charged to fundraisers and investors as a percentage of the sum gathered or invested (usually 5-10%).
- “All-or-nothing” funding model dominates (73% of surveyed platforms).
- The majority of platforms are autonomous, profit-oriented companies (73%).
- R&I projects tend to be much less successful than other projects.
- Project feasibility and economic impact are the main factors taken into account by platforms when selecting R&I projects.
- R&I-oriented platforms perform a pre-quality check of projects before listing them. However, there is no standard approach (it differs between platforms, funding models, area & degree of specialisation of AF platforms).
- Key success factors of platforms: reliable network of fundraisers and investors, national / international recognition of a platform, offering different CF models within one platform, and offering at least some form of mentorship for fundraisers.
- Key challenges:
 - 1) Platform specific: profitable business model, network for crowd engagement, managing return expectations of investors, transparency of investors, crowd liquidity, gaining the trust of investors.
 - 2) Country specific: the development of AF platforms is correlated with the maturity of the alternative finance market, availability of AF, cultural readiness and the existence of support measures, as well as the lack of impediments.
 - 3) Cross border: regulatory fragmentation at EU level and the existence of different regulatory regimes amongst different countries (nine countries introduced their own bespoke AF regimes so far (Austria, Spain, France, UK, Italy, Germany, Portugal and most recently Finland and Lithuania).

3.1 Overview

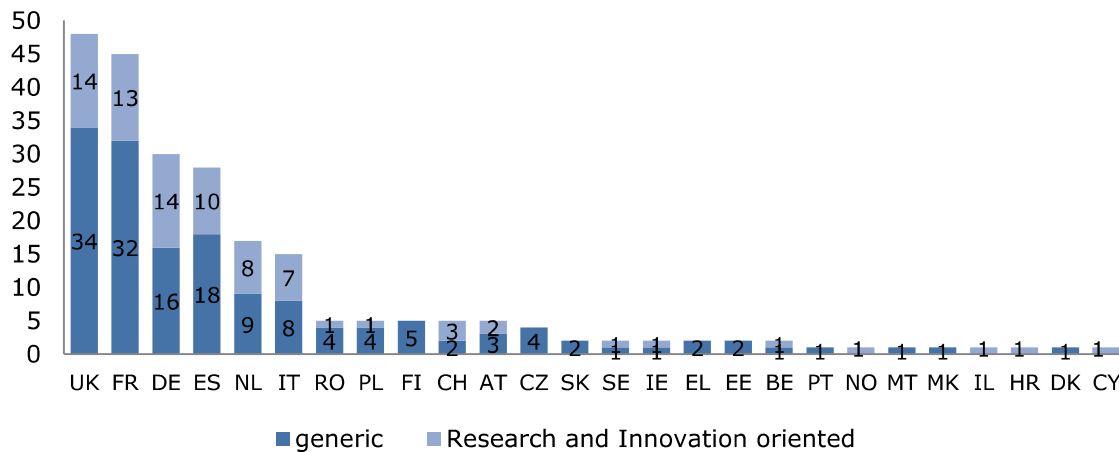
The study mapped 232 platforms (approx. 42% of European platforms) with a research and innovation scope in Europe, of which 152 (66%) are generic platforms with a R&I scope, and 80 (34%) are exclusively dedicated to research and innovation (R&I-oriented). The categorisation of the platforms was performed on the basis of the analysis of their vision statements as well as project categories incorporated into the selection criteria on the AF platform.

The category of generic platforms with R&I scope also includes P2P lending platforms. Lending platforms usually do not narrow their scope to a specific area, thus within the scope of the study, the assumption has been made that they will also offer some funding possibilities for research and innovation projects.

In line with an overall trend of alternative finance in Europe, **the majority of the analysed platforms are based in six Western European countries:** UK (21%), FR (19%), DE (13%), ES (12%), NL (7%), IT (4%) that cover almost 79% of all platforms in the study database of platforms with a R&I scope.²⁰

Those countries might be considered as more mature AF markets that are now moving into higher institutionalisation and specialisation phases. Likewise, those markets register most of the platforms specialising strictly in research and innovation: DE (14) and UK (14), FR (13), ES (10), NL (8) and IT (7).

Figure 13 Number of platforms with R&I scope in Europe



Source: Database of platforms with a R&I scope, crowdfunding4innovation.eu, (n=232)

Although the total number of active platforms is growing over the years, the number of platforms founded in a specific year has been steadily decreasing since 2014.²¹ The (Crowdsurfer-EY, 2015) and (Cambridge-KPMG, 2016) reports confirms this slowdown in the creation of platforms, suggesting a possible consolidation trend.

3.1.1 FUNDING MODELS OF PLATFORMS

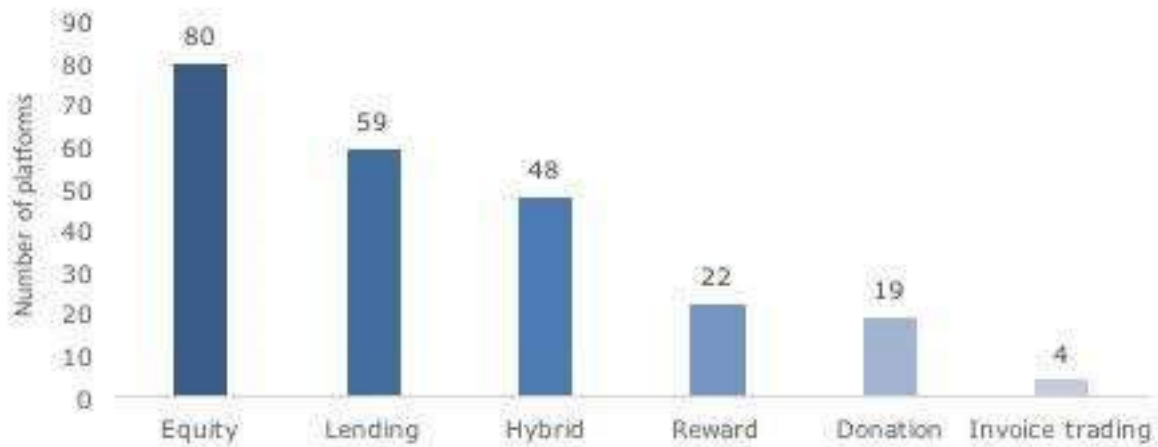
The majority of the AF platforms with a R&I scope in study database are equity platforms (34%) and P2P lending platforms (25%). Moreover, whereas 79% of platforms are using only one funding model, over 20% of them adopted a hybrid funding model (29 generic platforms with R&I scope and 19 purely R&I-oriented platforms).

The importance of hybrid platforms for R&I projects in Europe is further confirmed by the platform data analysis. According to the analysis of European projects, crowdfunding via hybrid platforms constitutes the highest share both in the number of projects (52%) and amounts raised by projects (44%).

²⁰ Though, according to the report Finland ranks in TOP 6 whereas Italy falls outside (Cambridge-KPMG, 2016).

²¹ The analysis is based on the sample of 222 platforms with available information of the foundation date. Moreover, our analysis classifies as active only platforms that have active running projects or a recent history of projects. Platforms in a starting phase are considered as inactive.

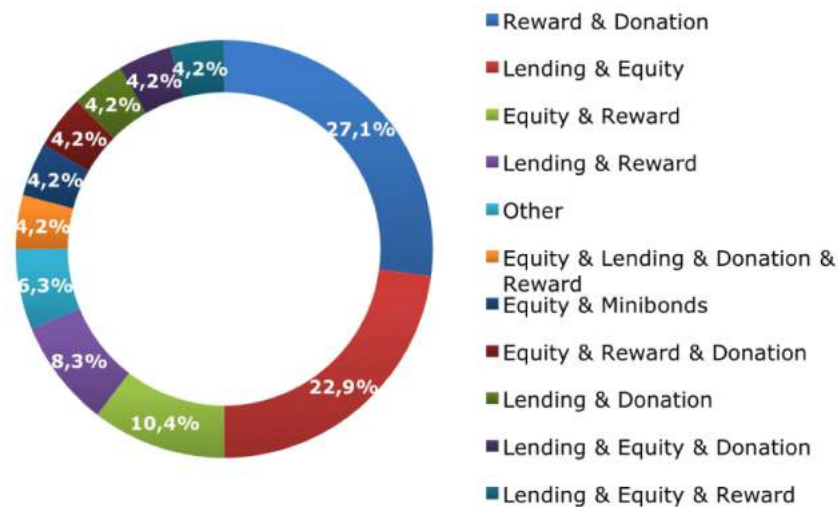
Figure 14 Funding model of platforms with R&I scope in Europe



Source: Database of platforms with R&I scope, crowdfunding4innovation.eu (n=232)

The notion of “hybrid” can contain many different possible combinations. **Error! No s'ha trobat l'origen de la referència.** reveals that the combination of rewards and donation funding model is the most popular among selected platforms (27% of hybrid platforms), followed by a mix of lending and equity funding (23% of hybrid platforms with R&I scope). A combination of equity and rewards was adopted by 10% (five) of hybrid platforms whilst a mix of lending and rewards funding is offered by 8% (four) of the hybrid platforms. Approximately 4% of the hybrid platforms (two) offered a mix of four popular funding models (equity, lending, donation and rewards).

Figure 15 Hybrid models of platforms with a R&I scope in Europe (%)



Source: Database of platforms with R&I scope, crowdfunding4innovation.eu (n=48)

The distribution of the funding models specific for generic platforms is different from that of platforms specialising in research and innovation (Figure 16). The majority of the generic platforms with a R&I scope offer lending models (32%), followed by equity (26%) and hybrid (19%). For R&I-oriented platforms the equity model is predominant (over 50%), followed by a hybrid model (24% - 20 platforms). This is due to the complexity of the research and innovation projects that require higher funding and more sophisticated investors. Moreover, within a hybrid model, a mix of 1) lending & equity, and 2) rewards and donation is prevailing. Based on the results of the survey of platforms, R&I projects are rare (about 21% of all projects) in P2P consumer and business lending platforms, and more frequent in equity (about 61%) and donation or rewards platforms (about 58%).

Figure 16 Funding models of platforms in Europe (%)



Source: Database of platforms with a R&I scope, crowdfunding4innovation.eu (n=152)

Source: Database of platforms with a R&I scope, crowdfunding4innovation.eu (n=80)

The reasons to offer different funding models by platforms are twofold. AF platforms want to accommodate different fundraisers' needs - different projects require different funding models, thus, platforms try to offer various options for fundraisers to increase their chances of funding. In addition, the AF market is highly competitive when it goes for the best project sourcing, thus offering various funding models increases the quality of a platform's services and helps to attract more high quality projects. AF platforms are still relatively small (as discussed in the section Business models of platforms) and many strive to diversify income sources for a profitable business model.

Indeed, according to the survey of users, the possibility to offer multiple funding mechanisms (e.g. equity, rewards, P2P lending) within the same platform is an option which more than two-thirds of respondents see as important in attracting investors (and 28% totally agree). Furthermore, the interviewed platforms considered offering different AF models as a competitive advantage, increasing their flexibility towards the needs of the fundraisers.

Case study: Oneplanetcrowd and its various funding models

Oneplanetcrowd (NL) is considered to be one of Europe's leading sustainable crowdfunding platforms. It operates in various sectors, from agriculture, energy, healthcare, to ICT research and innovation. Since its launch four years ago, it has registered a total of 17,000 active investors, and has raised over EUR 7 million in funding. Oneplanetcrowd builds mainly on two strengths:

- Flexible financial instruments
- An international network

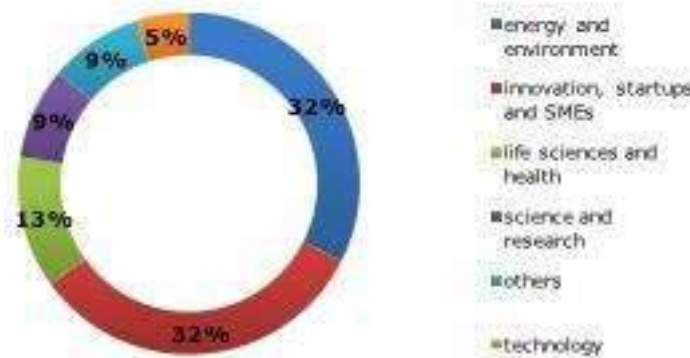
The platform engages with investors via four different crowdfunding models: rewards, donation, loans, and subordinated convertible loans. Furthermore, it is the only Dutch platform currently active also in Germany and Belgium. Starting next year, it will also be active in the UK for loans and convertible loans.

With a total of over EUR 3.1 million raised in 2015, and a 7.5 - 10 million funds forecasted for 2016, Oneplanetcrowd directs 76% of the total amount raised to research and innovation projects.

3.1.2 THEMATIC SPECIALISATION OF PLATFORMS

Further analysis of the declared fields of operation of platforms that are strictly R&I-oriented, reveals the existence of distinct categories of specialisation of the R&I-oriented platforms. The clearly distinguished **major categories** (Figure 17) are **renewable energy and energy efficiency (32.5%); innovation, start-ups and SMEs (32.5%); and health & life sciences (12.5%)**.

Figure 17 Areas of specialisation of European R&I-oriented platforms



Source: Database of platforms with R&I scope, crowdfunding4innovation.eu (n=80)

The innovation, start-ups and SMEs category is very wide, and interrelates with other categories. Nevertheless, based on the analysis of the mission statements of the platforms, it constitutes a separate category. There are only a few platforms focusing solely on technology in their mission, hence the relatively low share (5%) amongst the analysed platforms. The “others” category includes platforms with some social scope. This is consistent with the results of the surveys as presented above. The majority of the platforms fund projects in the field of energy (67%), followed by health (64%), food and healthy diet (47%), science communication, ethics, scientific education (44%), biotechnology (42%) and ICT (42%).

The predominance of the energy and health specialised platforms can be further explained by previously mentioned personal motivations - people are more eager to invest in and create projects related to their own life improvements, thus there is a demand for related platforms. In addition, these areas are clearly distinguished and more understood by the “crowd”.

The orientation of the platforms towards specific projects as expressed through their vision statements might differ from the subject of the projects available on their site. For example, the platform data analysis of the European projects on the selected platforms (generic and R&I-oriented) revealed that around 76% of all R&I projects identified as R&I are ICT related, followed by space (10%) and health and life sciences (8%).²²

European platforms specialising in energy and environment sector

Most of the 26 platforms included in the study database specialized in the renewable energy projects, for example: Windcentrale (NL), Lumo (FR), Green Channel (FR), Green Currency (NO), Bettervest (DE). A crowd can invest in projects in their municipalities that have direct social impact on their lives. For example, platform 1001Pact (FR) allows the “crowd” to invest online in companies with a social or environmental purpose, starting from EUR 100. An interesting platform is Sora equity (FR), a crowdfunding platform that promotes investments in eco-business, companies with a positive impact on the environment and / or positive social impacts.

European platforms specialising in Health & Life science

Only a handful of mapped platforms (10) focus purely on health and life sciences in Europe. This category includes crowdfunding platforms for life sciences such as FutSci (UK), and Capital Cell (ES); platforms specialising in investing in medical devices such as B-a-MedFounder (CY), and health products, such as MyPharmaCompany (FR), Zorgfounders (NL), Aescuvest (DE), as well as platforms set up by non-governmental organisations (NGOs) for specific health related research, such as ADHD Fund (NL), and MyProjects (UK) set up by the UK Cancer Research, or Doneaza CU Avon (RO), a crowdfunding platform for breast cancer set up by cosmetic company Avon.

European platforms specialising in research and science

Amongst the seven mapped platforms, the majority crowdfund for general science and research purposes. Examples include: ILoveScience (ES), Precipita (ES), Science Starter (DE), Vorticex (ES), and Wallacea (UK). DavinciCrowd (DE) supports projects in research and higher education whereas Digventures (UK) crowdfunds for archaeological projects.

²² This is further confirmed by (Schäfer et al., 2016), where in the sample of analysed science platforms, life sciences, health and engineering were in the forefront.

European platforms specialising in innovative start-ups and SMEs

The category of platforms focusing on innovation and support for innovative start-ups and SMEs is one of the broadest. Platforms such as Investing Zone (UK), MyMicroInvest (BE), Investiere (CH), Seedmatch (DE), The Crowd Angel (ES) and 1000x1000 (AT) support the innovative projects of start-ups and SMEs. An interesting example is CrowdPatent (DE), a platform that allows investors to directly invest in inventions and patent applications.

3.1.3 BUSINESS MODELS OF PLATFORMS

According to the survey of platforms, **most of the platforms are autonomous, profit-oriented companies** (73%), followed by non-profit companies (including foundations, associations, semi-government) (11%). Only a minority of platforms surveyed include a branch of another profit-oriented company or a subsidiary of another profit-oriented company (4%).

Apart from a few exceptions, currently most of the platforms have a start-up status, i.e. the incomes do not cover the costs yet. The majority of the platforms surveyed indicated an annual turnover of up to EUR 500,000 (78% of platforms) in the last financial year. Only 10% of the platforms indicated an annual turnover of more than EUR 1 million and up to EUR 2 million, and 2% an annual turnover in the last financial year of more than EUR 50 million.

The science-oriented donation-based platforms considered that it is hard to leverage huge amounts of funding, as this requires a large community, which does not exist yet. The donation and rewards-based platforms have problems in reaching a profitable business model as the fees are relatively low. *"The business plan of one donation-based platform reveals that it can only work at scale, i.e. a large number of projects are required. As each project brings new supporters, the community and also the raised funds grow"* as expressed by a platform representative.

In addition, the choice of business models between the platforms specialising in research and those focused on innovation is different. *"There is a clear difference in a way of operating of the smaller, donation or rewards-oriented research platforms and larger lending or equity related platforms"* as expressed by platforms during a dedicated focus group.

Whereas the platforms oriented towards innovation in the commercialisation phase focus on large investments (e.g. Lumo platform (FR) in the renewable energies sector), research centric platforms, such as ScienceStarter (DE) use alternative finance mainly to communicate science, and to communicate research as a process.

Overall, the business model of AF platforms is mainly based on the success fees charged to fundraisers and investors as a percentage (usually 5-10%) of the overall sum gathered (fundraisers) or invested (investors).

3.1.3.1 Platform fees

Crowdfunding platforms, especially those using the equity and lending models, are commercial undertakings. Therefore, most of the platforms rely on the variety of the commission fees as a way of making profits, such as one-time registration / listing fees, success fees, completion fees, campaign management fees. In return, they provide a certain level of services and support to fundraisers for free.

Most of the platforms do not charge any fees unless the project is successful. In particular, rewards and donation platforms, or a mix of the two, do not request any fees upfront. Not all platforms list the fees they charge, nor do they state that the fees are subject to change, or may change depending on project and its risk.

Table 6 Platform fees

Type of fee	Description
Success fee	5 - 10% in proportion of the total amount raised (the higher the amount, the lower the fee).
Registration / set up fee	EUR 200 - 2400
Completion fee	It applies to equity campaigns and covers administrative work, charged on completing a campaign
Co-investing in successful project	Platform re-invest percentage of the success fee back into the project, becoming the co-investor
Investor fees	Subscription fees (5 - 10% of investment) and performance fees for equity investments
Payment processing fees	1.4% - 3.4% of the value of the transaction
Other fees	e.g. fees for attending pitching events

Success fee

According to the analysis of platforms in the study database, platforms usually charge a commission of 5-10% in proportion to the total amount raised, a so-called success fee. The percentage of the success fee usually varies depending on an amount of the funding raised (the higher the amount, the lower the fee). Moreover, a platform can offer to decrease a fee if the goal of the campaign is reached within a very short period of time – for example, Symbid (UK) lowers the commission from 7% to 5% if the goal is reached within a week.

Registration fee

Some of the equity and lending platforms (where the average amount of funding is higher) charge a registration fee (also called a set up or publication fee) that varies from EUR 200 EUR to EUR 2,500). For example, an equity platform Socios Inversores (ES) as well as a hybrid platform, equity and lending, Symbid BV (NL), charge a EUR 300 registration fee; a hybrid, equity and lending platform like Syndicate Room (UK) charges a GBP 1,500 set up fee and commission on top. A Spanish life science oriented equity platform, CapitalCell, charges EUR 240 as a publication fee, but the initial work (editing, publishing, analysis, consulting, contracts) is free of charge.

Completion fee

The completion fee applies to equity campaigns and covers the administrative work undertaken to complete a campaign, including execution of shareholder agreements (for example: UK platform Crowdfunding charges GBP 2,000).

Co-investing in successful project

An interesting example is an equity platform AngelsDen (UK) that gives a 30-minute one-to-one consultation meeting with the team members for free. The project is displayed on the platform for free. However, AngelsDen charges a GBP 1,600 completion fee that is payable only on successful closure of the funding round, as well as a success fee of 6.5%, and an event pitching fee of around GBP 800 if the project wants to participate in one of the events. In return, the platform re-invests 20% of the success fee (6.5%) back into the project, becoming the co-investor in all successful projects. This guarantees the platform higher returns in the long-run, and it builds trust of the investors.

Investor fees

Fees are also charged to investors in proportion to the amount invested (5-10% of the amount invested) or as a proportion of any profit made by the investor (in relation to equity platforms) (ESMA, 2014). For example, a French equity platform, Smart Angels, charges a EUR 50 to EUR 225 fee for investors depending on the amount invested after the completion / monetisation of investment (which usually takes 5-7 years for equity investments).

For example, an equity and lending platform, MyMicroInvest (BE), does not charge any fees to investors investing in loans for SMEs. However, for equity investments, it charges a 5% subscription fee on top of the amount subscribed for investments. In addition, it withholds a performance fee from the capital gain made in the case of participations in the capital. This performance fee is withheld, only if a return of at least 5% per year is made by the investor, and is applied to the amount subscribed. In this case, MyMicroInvest retains 20% of the amount of the capital gain in excess of the 5% return per year. These rules have put MyMicroinvest under scrutiny from the general public, when the Newsmonkey (BE) decided to buy out the shares from investors leaving them at a loss after the deduction of the commission charged by the platform.

Payment processing fees

In addition, platforms charge payment processing fees. Most platforms mapped use PayPal for payment processing and fees depend on the geography. There tends to be a single transaction fee of EUR 0.30, and the percentage charged varies from 1.4% for transactions within the country or in the same currency to 3.4% when the transaction is not in the same currency or comes from abroad.

3.1.3.2 All-or-Nothing vs. Keep-it-All

The All-or-nothing model is adopted by the majority of the platforms. About two thirds of the surveyed platforms indicated the use of an "All-or-nothing" model (73%), compared to 31% using a "Keep-it-all" (KiA) funding model (which implies that around 4% use both models):

- In the **All-or-Nothing** model, platforms will release funds only if the full targeted amount of funding is raised in the allotted time, for example: Technofunding (UK), Symbid (NL), Seedrs (UK).

- In the **Keep-it-All** model, even if the goal is not reached, fundraisers can keep any funds raised even when money that the “crowd” has pledged is below the target capital (Belleflamme et al., 2015), for example: Greenrocket (UK), MyProjects (UK), Benefunder (US).
- **Mix of both models**, where platforms give funders a choice of which model to apply (for example: a UK platform Crowdfunder or US platforms Indiegogo and MedStartr).

The predominance of the “All-or-nothing” model is further confirmed by the platform data analysis. More specifically, 79% of the European R&I projects (vs. 89% of the worldwide projects) were hosted in AoN platforms, while 80% (vs. 86% of the worldwide projects) of the capital raised by European R&I projects come from AoN platforms.

The “All-or-nothing” model is more simple, thus more transparent, and safer for investors – when the stated amount of funding is not raised (which is a signal of the appeal of the project to the public), investors receive their money back without the need of ‘worrying’ about further success of the project that did not gather required funding. According to (Cumming et al., 2014) “AoN fundraising campaigns involved substantially larger capital goals and were much more likely to be successful at achieving their goals.”

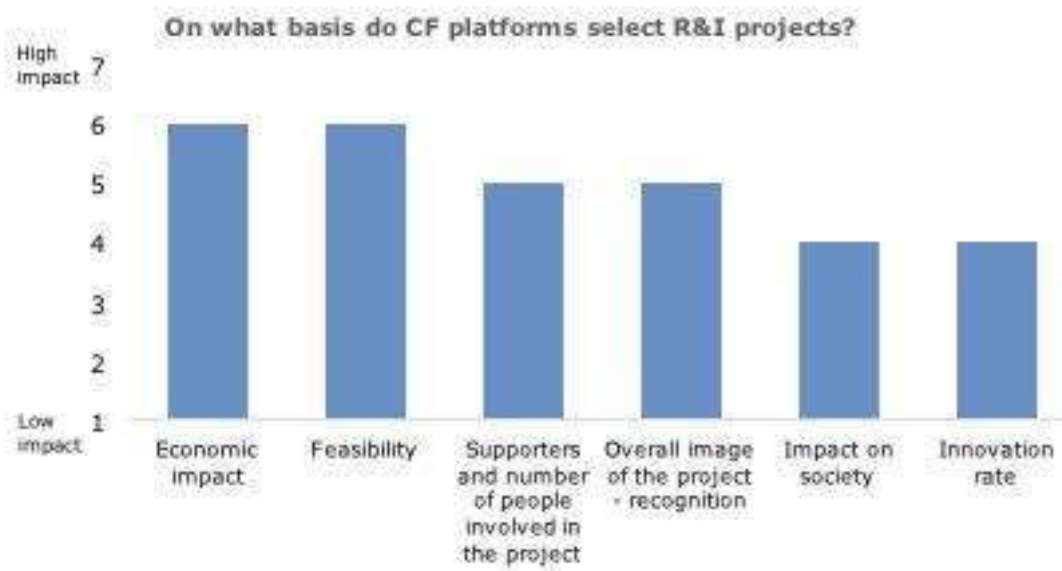
Moreover, some platforms allow for campaigns to be '**mostly** funded'. For example, FundingTree (UK) releases the funds if 90% of the goal is reached. In this case, the campaign would be considered a success. The equity platform Nestarter (ES) releases the funds gathered if the campaign reaches 70%, and Polish platform Ideowi releases funds if 85% of the campaign goal is reached. The success fee is charged as a percentage of funds gathered.

3.1.4 SELECTION CRITERIA FOR R&I PROJECTS

Interviewed platforms clarified that projects are usually chosen taking into account a variety of factors for the selection and risk assessment of the borrowers, adding that each platform may adopt its unique criteria.

As an AF platform is as successful as the project it displays, not surprisingly, the majority of platforms stated that the “**project feasibility**” and the “**economic impact**” are the most impacting factors taken into account by platforms when they have to select R&I projects and list them. Moreover, economic impact was followed by the “number of supporters of the project” as this is a factor that influences the chances of funding for the project (Figure 18 below).

Figure 18 Selection criteria used by platforms



Source: Interviews (respondents: 10 platforms)

According to the interviewees, the risks associated with AF campaigns are not only related to the company raising money but also to the product / project at the centre of the campaign. Thus, **the main elements assessed by platforms are not only the company rating, its past background and its financial credits, but also the team presenting the idea, the level of innovation of a project, the existence of intellectual property rights, the ability to attract**

potential investors to support the AF project, and the quality of the communication plans.

3.1.4.1 Means of assessment of R&I projects by AF platforms

As far as research and innovation platforms are concerned, the approaches to assess projects are diversified across funding models, areas and degrees of specialisation. The analysis of the mapped platforms shows that, conversely to the generic rewards and donation platforms, **most of the R&I-oriented platforms perform a pre-quality check of projects before listing them.** Similarly, according to (Oxera, 2015) all equity and lending platforms declare that they conduct initial screening, reporting rejection rates of at least 70% of received applications. However, the quality check performed by platforms varies in its scope and platforms do not share the same quality criteria.

Scientific Board /Expert panels

Many platforms set up **scientific boards** (for research oriented platforms) **or expert panels** (for innovation focused equity platforms) to assess projects according to pre-set **quality criteria** before they are launched publicly. For example, a project to be admitted to the health-related platforms, such as Experiment (US), Aescuvest (DE), Capital Cell (ES) and ADHD Fund (NL), must meet a set of scientific criteria and be approved by a board composed of experts specialised in the field or composed of professional investors.

Pre-selection quality criteria

Though only few platforms interviewed during the course of the study declared that they use a pre-defined checklist to assess the risk profile of borrowers, most of them have set up qualitative pre-selection criteria.

For example, platforms specialised in scientific research explained that *"scientific aspects have to be assessed because they determine the success of the project"* and *"the criteria need to be science related or related to science communication"*. Thus, science oriented platforms attempt to make **a background check** on the researchers and their research credibility.

For example, Wellfundr (FR) requires that projects are only submitted by **professionals** in healthcare (universities, physicians, doctors), and that the platform is run by the healthcare professionals themselves. The US health-centred platform Medstartr requires projects to be in the medical trial phase.

Similarly, a few research platforms only admit projects submitted by **well-known universities or research institutions** (for example, the US platform Lifespna.io requires projects to have researchers in the team, the Spanish platform Precipita requires research projects to be submitted by a research centre or start-up, to be a part of scientific collaboration). Science-oriented AF platform Fiat Physica (US) requires that the project must be related to a **clear branch of science**, and must have **a measurable goal**.

Moreover, platforms focused on innovative start-ups stress that **previous references** and the **background of the fundraisers** are important for the selection, as well as **their ability to intercept new investors**.

Platforms targeting profit-oriented investors ensure that projects are first vetted by expert panels, as well as meeting the criteria established by the platform itself. The Crowd Angel (ES) demands that start-ups demonstrate already obtained **initial funding** of EUR 150,000 in order to be listed. Vetting projects beforehand is crucial in order to ensure that the platform maintains a relatively high success rate of crowdfunding projects. *"We also look at the amount of funds the project team wants to target as an indicator of their reliability. They have to demonstrate that they are going to be capable of achieving it"*, pointed out by director of an R&I AF platform.

In general, start-ups must be established in a legal manner (registered as a **legal entity**). Some platforms admit projects that have already applied for a **patent** (Cyprus platform B-a-MedFounder), or that they fulfil criteria set by a national chamber of commerce.

Table 7 Pre-selection quality criteria of AF platforms specialising in R&I

Research-oriented platforms	Innovation-oriented platforms
<p>Scientific board to assess projects according to set quality criteria, such as:</p> <ul style="list-style-type: none"> • Background check on the credibility of the researchers, • Projects only by well-known research institutions or professionals in the field, • Project must be related to a clear branch of science, and must have a measurable goal. 	<p>Projects are vetted by expert panels that checks:</p> <ul style="list-style-type: none"> • Previous references, the background of the fundraisers and their ability to intercept new investors, • Demonstrated initial funding, • Registered legal entity, • Meet criteria set by a national chamber of commerce.

Source: Authors' elaboration

Strict specialisation/market knowledge in the field

Whilst assessing which innovation projects should be accepted to equity platforms, specialised platforms, such as renewable energy platforms, rely on trusted relationships and the successful track records of projects.

Cooperation with banks

Some platforms have also partially established partnerships with banks that redirect the projects to AF platforms. In this respect, the projects already receive some background checks from the banks. For instance, BNP Paribas Fortis formed a partnership with the Belgium's leading AF platform MyMicroInvest to strengthen the capital base of start-ups before applying for a loan with the bank (BNP Paribas Fortis, 2014).

Wisdom of the "crowd"

Wisdom of the crowd logic has been adopted by the AF platforms themselves whilst deciding which projects to support. For example, a German crowdfunding platform for science, Science Starter, requires projects to win a certain number (based on target funding) of fans from the registered community within 30 days. If enough fans are won, the project can proceed to the funding objective (Osimo et al, 2015).

3.1.4.2 Project assessment by P2P Lending platforms

On P2P lending platforms lenders are exposed to uncertainty and risk in their lending decisions. Nine types of risks have been identified in different stages of the online lending industry (Wang et al., 2015): insufficient credit checking; inadequate intermediation; untimely repayment; lack of liquidity; lack of transparency; operational and technical failure; legal risk; excessive leverage; and lack of ethics. Lenders can assess and classify the risk profile of borrowers in two ways (Dongyu et al., 2014). In a direct assessment, the lender checks the reliability and the adequacy of the information provided by the borrowers in their loan request. Such information may directly reflect the borrower's honesty and reliability. In an indirect assessment, the borrower's rating on the P2P lending platform acts as a proxy for their reliability (Dongyu et al., 2014).

Lending is mainly influenced by trust. Information asymmetry affects trust, but it does not have a significant influence on lending intentions. However, the reputation of borrowers and the information integrity of loan requests have a significant impact on trust that can be significantly reduced through Big Data technologies, which provide a more complete picture of borrowers (Yan et al., 2015). Traditional banks may not have the technical ability or analytical skills to use these new forms of data, because they use traditional, simplistic indicators of credit risk such as an applicant's assets, existing liabilities, and FICO score (Yan et al., 2015). Instead, **P2P lending platforms use indirect assessment, analysing more dynamic data points from public websites, agencies, and public records.** Relevant big data may include: purchases using credit cards; accounting records from small business bureaus; lifespan of the borrower's email address; the number of connections on Twitter, Facebook, or other social media sites; reviews and ratings from business directories such as Yelp; and local and government public records (Yan et al., 2015). **Some peer-to-peer lending platforms stated that they run statistic assessments of the risk level amongst different categories whilst others use auditing and accounting reports.**

In general, however, according to P2P lending platforms, they require the 2-year credit history of borrowers. In this respect, **they act similarly to bank institutions.** Crowdfunding platforms, however, are not exposed to the risk the way banks or borrowers are. Instead, they provide the tools to investors to control risk exposure through providing information and the credit scoring of

prospective borrowers, enabling real-time reporting on the supply of lending bids, allowing borrowers to diversify across loans and to spread risk across investments and investors, and providing the online monitoring of the loan performance (Pelizzon et al., 2016).

Furthermore, according to (Freedman and Jin, 2014) some borrowers use their social network to get better loan deals, the connections of the borrowers are a signal of their credit worthiness to investors (Lin et al., 2009).

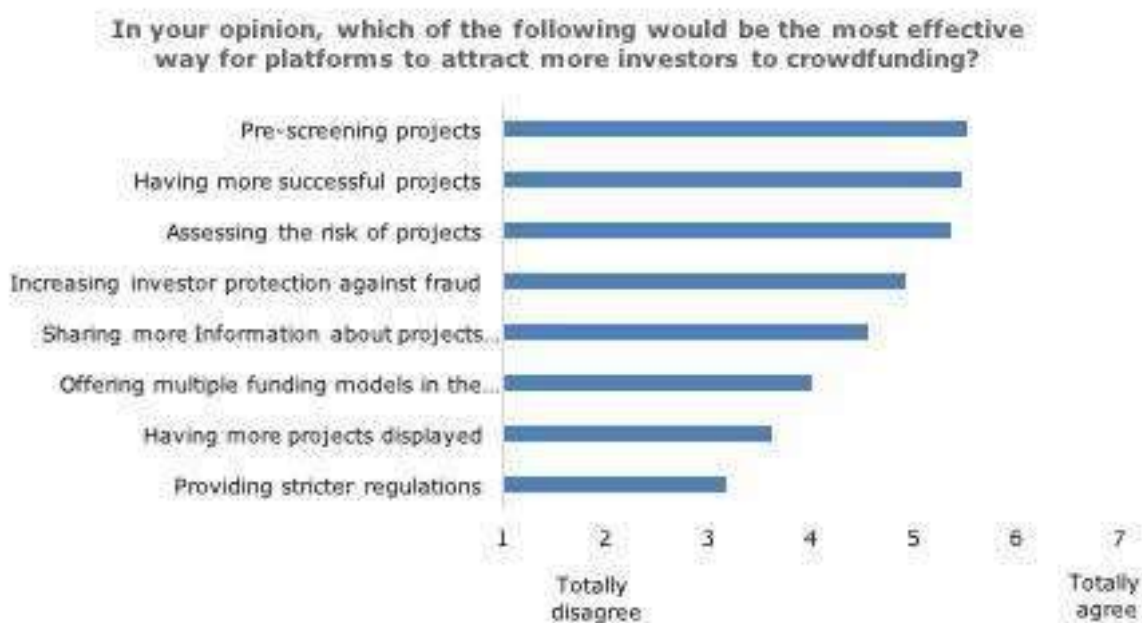
3.2 Bottlenecks

3.2.1 PLATFORM-SPECIFIC CHALLENGES

The AF platforms interviewed during the case studies named the following factors as important to their success: a reliable network of fundraisers and investors; national / international recognition of a platform; offering different AF models on a platform in order to give investors greater flexibility; and offering at least some form of mentorship for fundraisers to increase the success of projects.

Moreover, when asked about actions to be taken by platforms in order to increase their attractiveness (see Figure 19), and therefore increase their success, stakeholders considered performing **pre-screening of the projects** and **listing more successful projects** as the most effective ways for platforms to attract more investors to CF, followed by **assessing the risk of projects**.

Figure 19 Actions to be taken by platforms to increase their attractiveness



Source: Interviews (28 respondents including 14 investors, 14 innovation eco-system players)

On the other hand, the list of **platform-specific barriers** named by platforms and stakeholders include:

- **Finding a profitable business model** for R&I AF platforms.
- **Ability to effectively interact with the “crowd” and engage it** – the complexity of R&I projects is considered a drawback when explaining a proposal within the space of a CF campaign adequately enough for the “crowd” to be able to understand risks and opportunities it.
- **Difficulty to explain to a large crowd the risks related with each AF model offered and manage return expectations** - return expectations of investors are multi-layered and are usually not adequately addressed by projects owners, also due to unknown future developments.
- **Transparency around investors** – platforms lack information on investors in order to allow judgement of the project based on the reputation and skills of co-investors (in particular for lead investors).
- **Managing crowd liquidity** - platforms face difficulties managing the matching of relevant projects vs. capital available to ensure both timely funding of projects and timely and adequate investment opportunities.
- **Trust issues investors have regarding the ability of fundraisers or platforms to deliver effectively** - especially managing reputation risk within a specific community.

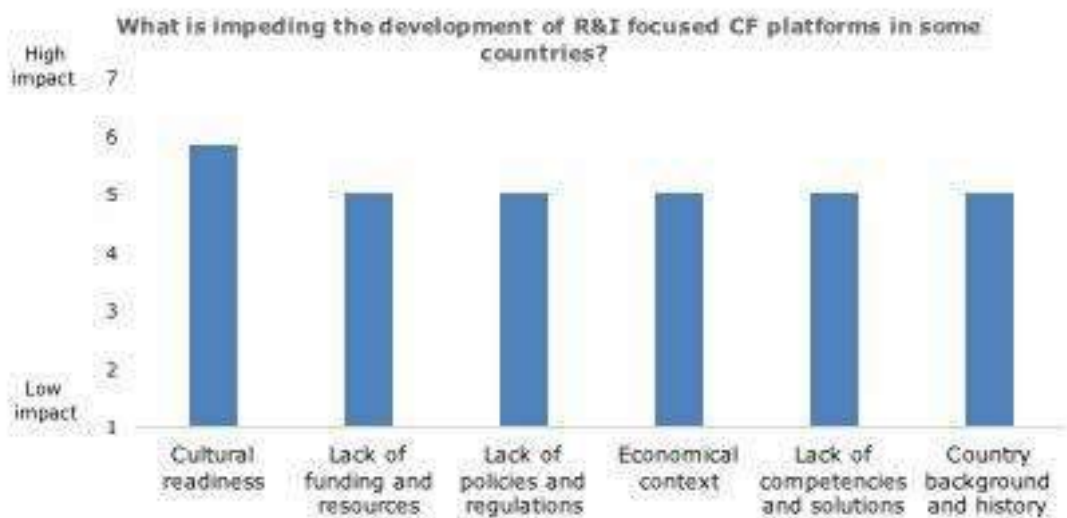
During the FGs, stakeholders stressed certain issues specific to research-oriented AF platforms. Research – rewards-based crowdfunding in Europe is challenging. The presence of larger US

platforms in this segment makes it difficult to develop an alternative for the European fundraisers that could be able to reach the same dimensions. Rewards-based platforms reached a significant size only in the countries with a vivid AF scene, such as France (e.g. Kisskissbankbank, Ulule) and Germany (Startnext). Attracting big projects in research is therefore very hard for a European rewards platform, as fundraisers are more likely to choose established US platforms. Amongst surveyed fundraisers, the two most cited platforms on which to host the future campaigns were Kickstarter (21%) and Indiegogo (14%).

3.2.2 COUNTRY-SPECIFIC BARRIERS TO THE DEVELOPMENT OF AF PLATFORMS

The faster development of AF platforms, and AF for R&I, in some countries rather than others, depends on many country-specific factors, according to the interviewed stakeholders: such as the maturity of alternative finance market, availability of alternative financing, cultural readiness and the existence of support measures, as well as the lack of impediments (Figure 20).

Figure 20 Perceived impediments to AF development



Source: Interviews (24 respondents including 10 platforms, 14 innovation eco-system players)

The majority of the stakeholders interviewed agreed that **a higher development of AF in some countries rather than in others depends on a number of different factors, all connected to the existence of the specific and complex ecosystem that characterises each country:**

1. **Cultural readiness and the existence of a context open to innovation** – namely how they support innovation and how much the local research and investment environment is proactive in the field of R&I.

A UK platform stated that *“The uptake of crowdfunding can be very different from country to country. Some countries simply do not value the importance of crowdfunding for R&I as much as others, and in those countries a crowdfunding campaign can take a lot of time to be successful”*. Confirming this, some interviewees noted that AF is more developed in the USA and UK than in other EU Member States because these countries are more open towards innovation and FinTech in general.

2. **Cultural awareness of different forms of financing** - affecting the availability of fundraisers and investors.
3. **Regulation of a country** - Having a regulation can provide transparency and legal certainty for businesses, platforms and investors, and tax incentives (such as UK tax exemption schemes) promote AF as an investment method.

The overall sentiment of interviewees was that **the lack of a clear responsibility on financial supervision at the EU level** might have some negative impacts for the protection of consumers and investors active in AF.

4. **Availability of the financial resources in the economic context**

If the economy is not in a good situation, the lack of funding and resources may affect the potential of AF and other alternative finance options. In this respect, an Austrian platform

stated that also “*the situation of the entire financial system (banking and policy) could be a problem*” for the development of the AF market in a specific country.

5. Size of the country - some of the countries are too small for AF platforms to scale-up.

For example, participants of the focus groups mentioned that Austrian platforms are expanding to Germany and Switzerland (German speaking markets) as the investments in Austria are not big enough to scale up.

6. Geographical context - AF is more likely to be used in a metropolitan area rather than in other parts of a country, where more traditional forms of finance are predominant

7. Internet penetration levels and popularity of online tools.

Interviewees stressed the importance of different penetration levels on the internet as a key factor in supporting or limiting the development of the entire AF market in some countries, together with the different orientation of consumers towards online banking tools and similar options.

AF platforms and market failure

Overall, **AF is perceived as a growing market in the EU and the majority of interviewees do not believe this sector could suffer from a market failure.** However, some interviewees identified a few market gaps at the EU level with specific regard to information asymmetries and the lack of homogeneity in access to finance in different MS. Amongst the interviewed stakeholders, platforms agreed that potential AF market deficiencies could be connected to cross-border operations rather than to national ones. According to these platforms – even if public aid should remain an exception - the EU could support SMEs that are engaging in alternative finance as well as companies that are active in R&I.

3.2.3 BARRIERS TO CROSS-BORDER OPERATIONS OF AF PLATFORMS

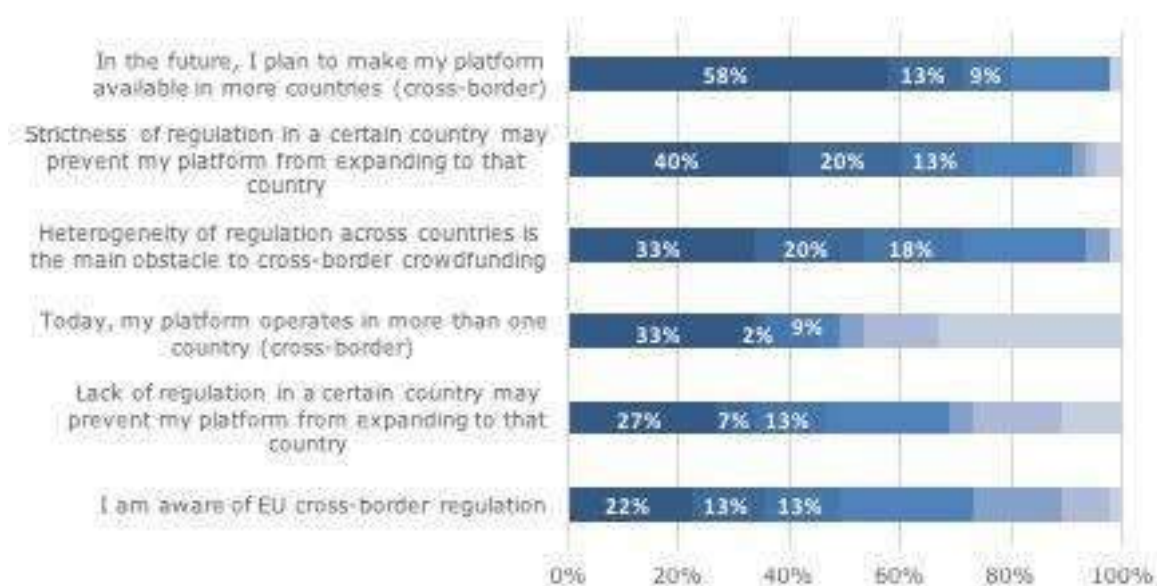
As outlined in section 2.1, most of the platforms during dedicated focus group claimed that they do not offer cross-border investments, due to different national regulations and high costs for implementing certain models. Investments remain quite local: an important share of the European platforms are still working in one language, and as highlighted by (Cambridge-KPMG, 2016) “*local crowdfunding prevails*” – 76% of platforms registered no cross-border fundraisers and 46% declared having only national investors in 2015 (Cambridge-KPMG, 2016). “*...Predominance of domestic AF is caused by a very low proportion of backers / funders that actively look for projects. Usually, the visibility and reach of campaigns come from the platform’s mailing and media coverage, that are domestic-oriented and in a specific language*”, as mentioned by a founder of an AF platform.

Accordingly, **70% of surveyed platforms declared that less than 20% of funding comes from outside of the country of origin of the platforms** (Figure 21). At the same time 44% of surveyed platforms stated that they operate to some extent in more than one country, and the majority of them (70%) plan to expand to more countries in the future. Thus, only 38% of surveyed platforms indicated that they are aware of a related EU cross-border regulation (out of 14 equity platforms, five were aware).

As regards to the cross-border operations of AF platforms in support of R&I, interviewees highlighted the existence of some critical impediments. The large majority of interviewed respondents identified **regulatory fragmentation at the EU level and the existence of different regulatory regimes** amongst different countries, as the main obstacles in cross-border operations. In addition, most stakeholders stressed that the lack of a comprehensive regulation on cross-border AF represents an obstacle for the development of AF platforms and projects funded via AF. “*Every country has its own protection and this makes it hard to go cross-border*” – debt-based platform.

According to some stakeholders, impediments depend on the type of AF model. As stated by the interviewed innovation eco-player, overall, “***impediments are small in donation and rewards-based AF models, whilst cross-borders operations in lending-based and equity-based CF are more complicated due to the different regulatory regimes in place at the national level***”.

Figure 21 Cross-border: drivers and barriers



Source: Survey of platforms. Does regulation impact the growth of crowdfunding? Please state to what extent (1=Totally disagree; 7= totally agree) do you see the following provisions as "barriers" or "drivers" to the spread of crowdfunding platforms (n=45)

On the one hand, donation and rewards-based funding models are frequently not regulated in Europe. On the other hand, the regulation for lending-based and equity-based models considerably differs from one country to another. As a result, in order to offer investment opportunities in other countries, a platform has to set up a subsidiary for each country. Setting up a subsidiary requires additional investments that smaller platforms cannot afford. Therefore, as a consequence, they cannot grow.

Until now, **only nine countries introduced their own bespoke AF regimes** (Austria, Spain, France, UK, Italy, Germany, Portugal and most recently Finland and Lithuania) (Alois JD, 2016). and Belgium and the Netherlands accommodated AF in their general regimes. A lack of legal framework for most of the countries implies that regulatory constraints mainly come from non-specific regulations (consumer, etc.), whilst the influence of legal provisions varies from one country to another. Key areas could be mentioned which are clearly interrelated with alternative finance as an access to finance instrument: statutory exemptions regarding licensing, payment service, consumer credit, trade, privacy, and prospectus requirements, are amongst the main ones.

Case study on a CF platform: KissKissBankBank speaks about the key challenge to AF market

KissKissBankBank (FR) is one of the world's leading rewards-based crowdfunding platforms dedicated to establishing an alternative space for creativity and innovation. The platform's goal is to give the public the possibility to choose the ideas and projects that will shape the future, and to do so beyond mainstream trends.

When asked about the lessons learned from crowdfunding, the platform highlighted that "crowdfunding is very precious for our economy, and it is a very valuable tool also in comparison to other alternative finance methods." However, the platform leader stressed that in order to enhance the AF market "the regulation around it has to evolve in the future. We are not yet acting as a European actor in this field and this of course does not make us very competitive for example with the American AF market, which is definitely much more developed".

Due to important legal restrictions, AF platforms throughout Europe use a wide variety of business models and transaction designs. Equity and lending models are often heavily reliant on national exemptions or national interpretations of harmonised rules. Therefore, cross-border AF campaigns are usually problematic and rarely sustainable. Depending upon how AF is regulated locally, platforms might face different legal issues and operate compliance at very high legal costs.

Transaction-engineered platforms might, in addition, be required to obtain an authorisation for accepting reclaimable funds under the Capital Requirements Directive IV (CRD IV), they may qualify as an alternative investment fund (AIF) under the Alternative Investment Fund Managers Directive (AIFMD), or may be deemed subject to an authorisation as an investment service/task under the Markets in Financial Instruments Directive (MiFID).

Other barriers to cross-border operations mentioned by stakeholders include:

- linguistic barriers,
- cultural differences,
- differences in the tax models.

Increased investment risks, the reliability of platforms, and the need for more support to cross-border operations at national level are also considered as some of the main issues related to cross-border operations.

3.2.3.1 National regulators and AF for R&I

All regulators interviewed stated that, besides some form of national regulation for the AF market, **no particular actions have been taken so far as regards the regulation of AF and other forms of alternative finance specifically targeted at R&I.** Indeed, most of them agreed on the fact that since the AF sector is not mature enough, some countries are working to improve their national policy at a general and horizontal level, whilst the vertical regulation of AF for specific sectors will follow in the future.

In particular, some national regulators stressed that the main issue of not having a uniform regulation is that investors are not protected from activities on platforms in countries where AF is not regulated: *"we cannot control any AF platform in other countries"*, commented an Austrian regulator, adding *"there is a concrete risk for a platform promising a high return on investment on a project and then the day after, the platform's page is gone"*.

Notwithstanding this, the majority of regulators explained that AF has a good potential as a source to fund R&I projects, some adding that national and government support measures, including tax benefits and grants scheme, are still necessary for the development of R&I projects.

3.2.4 MIFID 'S ROLE IN ASSISTING AF PLATFORMS TO OPERATE CROSS-BORDER

Surveyed platforms indicated mainly the limitation deriving from national laws as barriers. Investable amount per project per investor was identified as a barrier by 62% of surveyed platforms, followed by existing national company law (51%). Only 37% of platforms perceive the provisions under MiFID as a barrier.

Introduction of the Markets in Financial Instruments Directive has partially regulated and harmonised equity crowdfunding in Europe,²³ yet the biggest part of the alternative finance market, P2P lending model, remains without harmonised regulation, or it is regulated at a local level. The majority of stakeholders agreed that the **MiFID is useful in assisting AF platforms to operate cross-border.** In particular, an EU regulator declared that *"the benefit of being within the scope of MiFID for a platform is that it has a passport to carry out the services/activities for which it is authorised, throughout the EU without any additional authorisation being required, in accordance with a single set of rules. This is at the 'cost' of complying with capital and other requirements."* However, neither many platforms are aware of existence of MiFID, nor they can afford the process of obtaining the passport to operate cross-border.

Moreover, interviewed platforms reported that **obtaining a MiFID authorisation is too costly** (costs of compliance such as internal audits) and, as a result, they **are structuring business models so as to fall outside the scope of MiFID requirements.** So far, only a few platforms, such as Invesdor (FL) or Wised (FR), obtained the MiFID passport that allows cross-border investments in Europe. As one of the regulators observed *"there is a concerning inclination to operate outside MiFID, as platforms think this regulation is too burdensome. As the MiFID is only applicable in the case of transferable securities, those who wish to fall outside the MiFID are offering non-transferable securities, which are riskier for the investors making it harder to liquidate their investments."*

²³ MiFID only covers MiFID services (reception and transmission of orders, investment advice etc.) in MiFID financial instruments (notably transferable securities). This does not cover all types of equity crowdfunding.

Concerning prospectus²⁴ requirements for equity investments, according to ESMA, as offers below a certain size are expressly outside the scope of the Directive, MS have chosen different thresholds under national law for the minimum size of an offer to which the obligation to produce a prospectus applies. In this case, the strong incentives for project sizes to be kept below the relevant offer size threshold imposed under national regimes, pose challenges to the viability of the CF platform business model and reduce the use of platforms for cross-border offers with a total consideration of between EUR 100,000 - 5 million. This is particularly relevant for R&I projects, which tend to have larger than average AF funding and hence are at particular disadvantage in cases where a lower threshold is identified for prospectus.²⁵

Policy reports on the barriers to cross-border activity also point at the regulatory differences between MS. For instance, some Member States consider that platforms must be authorised under their national regime to operate, whether they hold a MiFID passport or not. Other Member States consider that a MiFID passport is sufficient to carry out investment activities in other MS (European Commission, 2016).

²⁴ A legally required document that describes offered financial security investment for the potential buyers

²⁵ The European Commission has proposed changes to the the current prospectus rules, that are currently being negotiated by co-legislators. Thus, the prospectus rules will change soon and this will have a positive impact on crowdfunding platforms as the exemption thresholds are very likely to change (the final thresholds are still to be determined).

4. FUNDRAISERS

This section describes main findings related to the demand side. Firstly, it discusses the data on the level of uptake by different types of fundraisers; then it analyses the drivers and bottlenecks behind different levels of participation in order to identify possible policy-relevant challenges.

The underlying goal is to understand whether AF is a useful instrument for individual amateurs or also for entrepreneurs and researchers; and to explore what are the main barriers that are preventing greater uptake by different types of users.

Key findings of the section:

- Individual innovators and entrepreneurs, along with SMEs, are the main beneficiaries of AF for R&I. Uptake by universities and large companies is limited.
- The overall impression of stakeholders is that the topic of AF is still not mature enough to attract larger institutions, such as universities.
- Drivers of AF usage by fundraisers: easier access to finance, validation of the product's potential, possibility to use AF platforms as marketing tools / communication channels, personal motivation, raising awareness of the project's cause, creating a network of contacts and partnerships.
- Key success factors of the AF campaign:
 - 1) Communication-related factors: strong communication strategy, depth of project description, frequency of project updates, provision of attractive video material and graphical visuals.
 - 2) Project-related factors: size of the pledging goal, duration of funding period.
 - 3) Platform related factors: choice of the relevant AF funding model for R&I, mentorship/guidance from the platform, reputation and experience of the platform in terms of project success rate, and the size of platforms' community.
- For research projects – the credibility of researchers behind the project is crucial.
- Key barriers for fundraisers:
 - 1) Fundraiser-related: lack of specific skills, such as creation of business plan, and the development of appealing communication; lack of awareness of AF and know-how on AF models; lack of resources.
 - 2) Platform-related: credibility of AF, transparency of platform operations.
 - 3) Project-related barriers: complexity of acquiring funding through the AF platform as compared to other financing options, disclosure / IPR issues.
 - 4) Ecosystem-related: lack of sufficient integration of AF into financing pipeline.

4.1 Overview

4.1.1 MOTIVATIONS BEHIND LAUNCHING AF CAMPAIGN

The motivations of entrepreneurs willing to raise funds through AF platforms are not only related to material considerations. The benefits of AF funding for R&I as highlighted by fundraisers include:

- Easier access to finance - giving life to a project that otherwise might have never found the adequate financial resources to do so,
- Validation of product's potential,
- Possibility to use AF platforms as marketing tools/ communication channels,
- Personal motivations and raising awareness of the project specific cause (environmental, social)
- Opportunity to create a network of contacts and form partnerships.

According to eco-system players during dedicated FGs, it appears that **AF is effective in attracting new players that are typically not reached through public funding, and niche themes that are overlooked by traditional funding.** In the (Startup Europe, 2016) study the

most important driver mentioned for using AF by web entrepreneurs was an easy way to access funds. Moreover, more than half of them confirmed that the difficulty of obtaining money from traditional financial institutions drove them to CF and other alternative finance options. According to the (Cambridge-KPMG, 2016) report, in the UK an estimated 20,000 SMEs received funding through AF, and 9,400 in the rest of Europe (ex. UK). This indicates that around 30,000 SMEs benefited from AF in 2015.

Furthermore, more than a half of web entrepreneurs in (Startup Europe, 2016) highlighted **the importance of AF as a marketing tool** for the projects and the opportunity to promote the project through an innovative channel. *"Individuals are usually driven by emotions and they are more attracted to communicative issues in AF"* – platform specialised in science. During focus groups, fundraisers confirmed the importance of CF campaigns as a marketing instrument for the project as 1) they raise funds, 2) build a community and 3) receive early feedback and ideas from the "crowd".

Case study on an innovation project: FOODSniffer – drivers of participation and benefits deriving from a AF campaign

FOODsniffer (LT) is the world's first mobile device that determines quality and freshness of food, specifically meat, poultry and fish. This device is fitted with gas, temperature and humidity sensors that take a sample of the air around the food, scan it and send it to a phone or tablet app via Bluetooth, indicating whether the food is safe to eat, or if it is better to throw it away.

The FOODsniffer AF campaign was launched in April 2014 on Kickstarter, raising a total of USD 77,500, exceeding the initial goal of USD 50,000. The money was raised from approximately 1,000 people mainly coming from the US, UK and Germany.

The three main internal drivers that triggered the engagement of the CF campaign coordinators were:

- Need to test market potential of the product,
- Opportunity to create new partnerships,
- Willingness to raise awareness on a health and social issue.

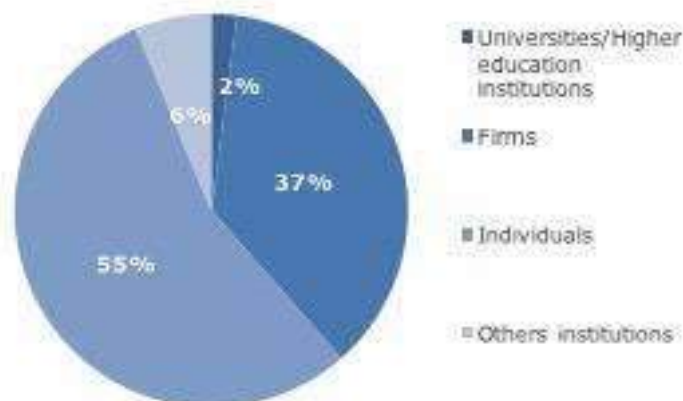
4.1.2 TYPES OF AF FOR R&I BENEFICIARIES

CF and other alternative finance for R&I are used by several actors to a different extent, with individuals and SMEs recurring more to such methods than universities and large companies. Though the ratios may slightly vary between different methods, all in all, **individual innovators and entrepreneurs, along with SMEs and start-ups, are the categories who use and benefit from AF for R&I the most**, as compared to other actors, such as large companies, universities and centres of research.

According to the platform data analysis of EU projects, in 81% of the cases the main beneficiary of CF²⁶ projects of R&I are individuals (or teams of individuals), whilst firms account for only the 13% of the cases. When removing Kickstarter projects, individuals remain the main beneficiary of the R&I CF projects (55%), however, the ratio of companies increases to 37% (Figure 22). The participation of universities and research institutions is limited, amounting for 6% of all R&I projects.

²⁶ Reward, donation and equity based crowdfunding.

Figure 22 Type of main Beneficiary of R&I CF projects – EU projects (ex. Kickstarter)



Source: Platform data analysis

More balanced participation by individuals and SMEs, and a much smaller role of universities, is confirmed by surveyed platforms and interviewed stakeholders. According to the survey of platforms, on average, 58% of all R&I projects were launched by SMEs and midcaps. Furthermore, on average, 43% of the total R&I projects were launched by individual innovators or scientists, and only 17% by university centres. Projects launched by large companies amounted to only 6% of all projects. Similarly, interviewed stakeholders argued that individuals, SMEs and midcaps have similar participation rates.

As the survey of users shows, **universities and other research institutions are not the main beneficiaries of AF projects of R&I in Europe.** The overall impression of stakeholders is that the topic of AF is still not mature enough to attract larger institutions such as universities. Platforms focused on science declare that they would welcome cooperation with research councils or universities to facilitate funding for projects which have not been successful in acquiring other research grants. However, according to the results of focus groups with eco-system players, universities and research centres are not very keen on using alternative finance:

1. They receive funding from other sources - are already supported by public funds and/or by the state.
2. They are struggling to understand how to deal with AF in combination with public grants.
3. They lack of awareness and education with regard to alternative financing methods.

These findings might imply, in general, that European organisations are less informed about the potential of AF for financing R&I projects. In turn, this lack of information may relate to the fact that AF has been around for a shorter period of time in Europe in comparison to the United States. A few examples of the universities that use the potential of alternative finance in Europe include the University of Groningen in the Netherlands and University College London.

With regard to large companies, interviewees agreed that this category is using AF the least. Large companies tend to be in a position to guarantee sufficient securities and access traditional finance. They also require higher funding levels than those offered by AF. Notwithstanding this, some interviewees noted that one reason for which large companies could use AF would be to use it as a valid instrument to make a direct and immediate evaluation of the service/product they wish to launch, based on the reaction of the market. A UK platform, specialised in science, also highlighted that this category would have more chances of being successful in a AF campaign, as they have a larger network vis-à-vis small companies and individuals.

4.1.3 ENTERPRISE CROWDFUNDING

‘Enterprise crowdfunding’ is defined as “employees allocating money for employee-initiated proposals on the Intranet site” (Muller et al, 2013). In other words, companies invite employees to propose and support ideas on an alternative finance platform inside the enterprise. Currently, there are not many examples of companies experimenting with internal crowdfunding for research and innovation, and their impact is unknown. The best-known example is the IBM experiment performed in 2013 (Bynghall, 2014 & Frick, 2013). The results were positive, but the concept proved more as an alternative way to test ideas inside the company and enhance inter-departmental collaboration rather than real R&I financing.

The potential of “enterprise crowdfunding” has not been widely recognised by all stakeholders. Overall, the views and insights of the interviewees on the role of ‘enterprise crowdfunding’ to foster internal research and innovation are discordant. Some stakeholders stressed that this financing method has a huge potential for companies and businesses. In this regard, a platform specialised in equity and rewards CF explained: “many of our clients use the funding to develop new products and also to have new shareholders bringing new ideas to the company”, and platforms and innovation experts think that it is a good way to test the innovation before putting it on the market.

4.2 Bottlenecks

4.2.1 KEY SUCCESS FACTORS OF AN AF CAMPAIGN

According to the majority of stakeholders, what determines the success of a AF project is mostly related to **how well the project is communicated** including: a strong communication strategy, depth of project description, frequency of project updates, provision of attractive video material and graphical visuals.

This is followed, closely by project-related factors: **size of the pledging goal, duration of funding period**, and platform related factors: **choice of the relevant AF funding model**, mentorship provided by the platform, **reputation and experience of the platform** in terms of project success rate, and the size of **platforms' community**.

With regard to the factors related to the project team, **the experience of the team behind the project** and a **strong network** for communication and crowdfunding support, are of major importance.

Case study on an innovation project: Peerby Campaign and Key Lessons Learned

Peerby is the world's leading platform in the field of sharing. Peerby was born in the Netherlands as a result of the start-up's founder, Daan Weddepohl, experiencing a loss of all his belongings due to a fire: the only possibility he was left with was to rely on the people around him. For the last three years, Peerby has been making an effort to contribute to a transition from a throwaway economy to a circular economy in order to consume less and, thus, positively contribute to the climate challenge the world is currently facing. By using the Peerby app, everyone gains instant access to the things in their neighbourhoods.

In 2016, with 1,052 investors, Peerby was able to exceed its target goal of EUR 300,000 in only four days of the campaign launched on OnePlanetCrowd, proving an outstanding turnout. The start-up raised a total amount of over EUR 2 million, exceeding expectations.

Key lessons learned shared by Peerby is to make sure that sufficient amount of research is carried out before the launch of an AF campaign and that the "crowd" is properly addressed:

- *"Once the project is online everything has to be ready and the market potential has to be clear to the team, along with the risks and opportunities*
- *(...) a solid business plan is therefore the turning point in this phase.*
- *Give the "crowd" a clear message and make them feel as engaged as you can.*
- *Pledge your goal realistically to your needs and be open and honest with your intentions."*

For R&I projects, some factors are of particular importance: ability to translate complex issues into easily understood communication, the credibility of the team behind the project, the choice of the right funding model and right AF platform.

For **innovation**, stakeholders mention that a clear success criterion is to **address emotions** and/or to focus on a **specific community** and target related AF platforms that create trust through market knowledge. In addition, innovative start-ups and SMEs from case studies, stressed the success factor related to the **originality** of the project launched. Similarly, research projects interviewed for case studies, highlighted the importance of presenting a **controversial topic** in order to attract more attention and appeal to the "crowd".

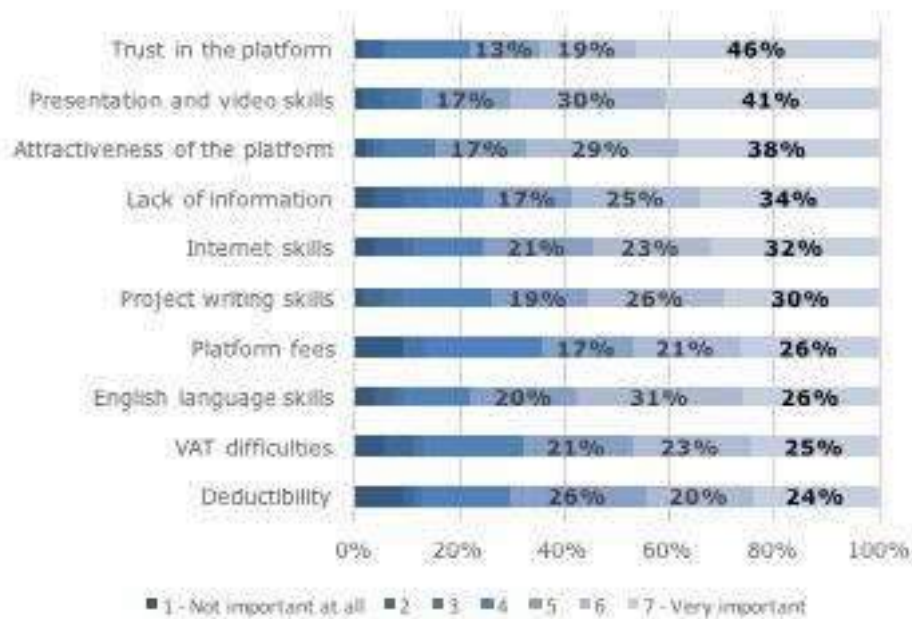
With regard to **research projects**, a factor of a major importance is the **credibility of the researchers** behind the project. During the FGs, platforms stated that projects that are backed by professors are more likely to receive funding than projects run by students. Similarly, research projects that are backed by higher education or governmental institutions are a primary choice for platforms. Furthermore, in order to create trust, a research history or publications are necessary. Similar to innovation projects, the research projects interviewed for case studies highlighted the importance of presenting a **controversial topic** in order to attract more attention and appeal to the "crowd".

Communication-related factors

The cross-analysis of eight projects depicted in case studies reveals that all project categories have three success factors in common: (1) effective use of communication channels, such as social media, (2) having strong communication strategy made of catchy messages and visuals, (3) taking AF seriously and foreseeing the potential risks.

In detail, most stakeholders defined the **depth of project description** and the **availability of project updates** as “very important” for the success of an AF campaign. A large majority of surveyed fundraisers (80% of answers 5-7) agreed that the availability of project updates is important, and an equally high percentage confirmed the importance of the depth of the project description (76% of answers 5-7).²⁷

Figure 23 Factors determining the success of an AF campaign



Source: Survey of users. In your opinion, how important are the following “drivers” for projects to list on crowdfunding platforms? (n=55)

The first was critical to investors, who commented that in order to invest in a project, they have to receive as many updates and detailed information as possible. “The more you explain well what you do, the more people would be confident in lending you money”- funding expert.

Existing research shows that thorough preparation and extensive communication (also through social media) is a key prerequisite of a successful AF campaign. Thorough and professional preparation are not only important to convince funders, but they also show the professionalism of the proponents (Mollick, 2014). The importance of communication and presentation related aspects of the project is further highlighted by the results from the survey of users.

Current and potential fundraisers name the **provision of video material and graphic elements as one of the most important drivers of an AF campaign for R&I**. Nearly half of the surveyed fundraisers (current and potential) rated the inclusion of video material in their campaign as “very important” (73% of answers 5-7), whereas 38% rated graphical accompaniment as ‘very important’ (84% of answers 5-7). Visual material was also considered as highly important by interviewees, who commented that videos could help the project to be visually more appealing, hence determining a broader success of the campaign

²⁷ According to (Xu et al., 2014), projects with continuous updates have 58.7% success rate, against 32.6% for those with no updates.

Case study: The Ocean Clean-up Campaign - communication and network as key success factors

The Ocean Cleanup project aims at developing world's first feasible method to rid the oceans of plastic. Over the funding period (100 days) the team raised over EUR 2.1 million out of the initially requested EUR 2 million in order to build up a more structured and professional organisation and to achieve the necessary skills to move towards the pilot testing phase of the project.

Key success factors:

- the broad scope of the advertising and marketing campaign,
- the capacity to engage a wide community of people genuinely interested in supporting the project.

In order to raise awareness on the issue at stake and make the campaign successful, the AF campaign team committed to translate technical aspects of the study into concrete examples and impacts, further engaging the public into "the Ocean Cleanup" mission. The project wasn't seen as just chance to crowdfund a project, but was aimed at raising awareness on a pressing social issue: the pollution of the oceans. The campaign, thus, strived to achieve both social and monetary goals.

Partnerships were established with key players including financial institutes, media and social media channels and pages known for viral content. The scope and value of the project was of natural interest to many donors and the feasibility of the project was ensured prior to promoting it.

Project-related factors

From the factors related to the project itself, the **size of the pledging goal** and the **time duration of the funding period**, are seen by fundraisers as equally important elements for the success of an AF campaign. Particularly, a Norwegian fundraiser pointed out that: *"usually, fundraisers set the pledging goal relatively low so that when it is reached it looks better for the project. However, if it is too low it can be a problem because one might not be able to deliver to its backers once the campaign is over. A Fundraiser must be realistic."*

Finally, some stakeholders interviewed identified **the geographical proximity to the project** as very important for its success in AF: *"the closer the investors are to the project, the bigger the interest in investing into the project"*. Moreover, due to heterogeneous national legislations, equity and lending based AF platforms are preferred by fundraisers and backers. National platforms are also considered more suitable for involving local stakeholders.

Funder-specific factors

A number of investors stressed the importance of having **a winning team** as well as a **strong network** when developing a successful AF campaign for **innovative projects**. Personal networks are important factors in explaining the success of crowdfunding efforts. As (Mollick, 2014) puts it, "a founder with ten Facebook friends would have a 9% chance of succeeding, one with 100 friends would have a 20% chance of success, and one with 1,000 friends would have a 40% chance of success".

Interviewees also considered the field of the project as quite relevant to determine the success of an AF campaign, meaning that fundraisers should concentrate their activities and projects in a field that is coherent with their organisation, or business area.

Previous experience in AF was considered as the least important success factor by surveyed users. Only 8% rated the funder's previous experience as an investor as "very important". However, as the V3PO cases study shows, previous AF experience or hiring an AF expert can be the "break it or make it" factor.

Platform-related factors

A significant factor that came across during focus groups is the strategic aspect behind the **selection of a certain AF model for research and innovation projects** (as described in section 2.2). Depending on the intention, the funding goal and the development stage of a company, different AF models might have different impacts. For example, projects with a very low Technology Readiness Level (TRL) might be more suitable for donations, while projects with a high TRL could be promising for lending or equity-based crowdfunding.

This is connected to another aspect mentioned by fundraisers during the FGs: the **reputation of the platform** in terms of project success rate and **the size of platforms' community** constitutes and important factor in the project's success.

Moreover, several interviewees pointed out that the success of AF for R&I is determined by a synergic effort of fundraisers and platforms: *"if the platform helps you very intensively in doing the campaign, the story-telling, the video and the graphics, you can concentrate on explaining your competences and your idea, and that is a winning combination."* A cross-analysis of case studies of projects funded by AF revealed that receiving some sort of **mentorship or guidance from the platform** is one of the key success factors, both for innovation and research projects. Also, mentoring through business angels was mentioned by stakeholders participating in the focus groups as a useful tool to improve communication and reduce risk by stakeholders. In this respect, a Finnish investor highlighted the importance of the support given to the campaign by other actors, e.g. universities, institutions or other companies.

Case study on a research project: V3PO – drivers of participation and key success factors

The V3PO project, short for Vegetative Vermehrung von Pflanzen im Orbit (Vegetative propagation of plants in orbit), is the outcome of the deep interest of three 12th grade High School in science and space. This interest, as students of the Agricultural Scientific School in Germany, has led them to ask one fundamental question: Is it possible to grow vegetables or fruits on a space station?

When asked why AF was chosen, the project manager pointed out that *"we first tried to finance our project via traditional finance methods, but we were not able to. I guess our project was just too innovative and abstract at the time. I have a lot of experience with American start ups and innovative projects thanks to my work and that's why I thought about CF, based on the U.S example and success in this field."*

The V3PO CF campaign was characterised by four main success factors:

- The topic of space was a good way to attract attention, and get the space and science community involved. Particularly, with the commitment of NASA, the project gained a much wider and important recognition.
- The CF campaign team was very proactive in finding contacts and sponsors before launching the project. When the campaign started, people were already informed about it, which made it easier to raise funds.
- The team had previous experience with AF that allowed them to gain more knowledge on how AF works.
- The platform helped the team a lot in preparing the campaign. This included aid with video material and advice on how to structure the overall AF strategy.
- Expert support of an engineer, Christian Bruderrek, a project manager in Life Science for Airbus in Germany, helped to build the credibility of the project that was further enhanced by NASA support.

4.2.2 BARRIERS FOR FUNDRAISERS

Further analysis of bottlenecks highlighted by stakeholders over the course of the study, reveals the following categories of barriers for fundraisers:

- Fundraiser – related barriers: lack of specific skills, such as the creation of a business plan, the development of appealing communication, lack of awareness on AF and of specific models, lack of resources;
- Platform – related barriers: credibility of platforms, transparency of platform operations;
- Project-related barriers: Complexity of acquiring AF in comparison to other financing options, disclosure / IPR issues;
- Ecosystem – related barriers: lack of sufficient integration of AF into financing pipeline.

Although the barriers mentioned are relevant both for research and innovation, there is a difference in the importance of the barriers for both kind of projects. For **research**, a lack of awareness on AF and knowledge about credible specialised platforms, the complexity of AF, and a problem of matching AF funds with public grants are highlighted by stakeholders as more pressing barriers to be overcome before building skills. Conversely, for **innovation**, a lack of skills, lack of

awareness, transparency vs. confidentiality, resource factors and IPR issues are considered to be more important.

Cross-analysis of case studies of R&I projects

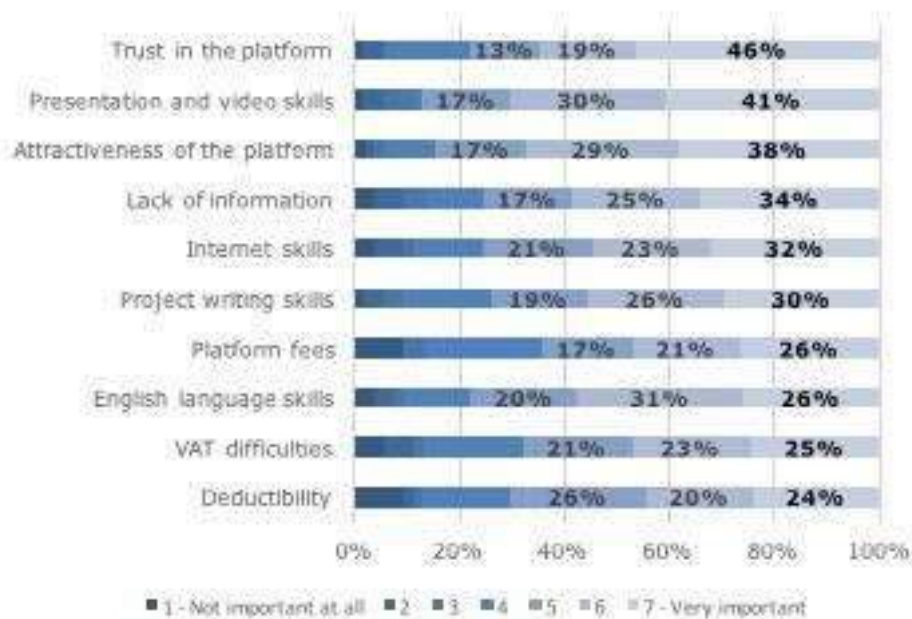
The cross-analysis of case studies highlighted three common bottlenecks for research and innovation projects whilst launching an AF campaign:

- No experience with AF and a lack of support can lead to wrong decisions when launching a campaign (choice of the initial pledge amount and duration of the campaign),
- Lack of cultural awareness on AF can reduce the impact of the campaign,
- Choice of an inappropriate or small (not trusted / not well established) AF platform can influence campaign reach.

Lack of specific skills

In terms of personal attributes, the **creation of a business plan** and the **development of presentations and videos** are important potential obstacles when listing a project on a platform according to interviewed stakeholders. Moreover, as depicted in Figure 24, not having adequate presentation and video skills is an entry barrier according to 41% of surveyed fundraisers (88% in 5-7 answers), followed by English language skills (77%), project writing skills (75%) and internet skills (73% of 5-7 answers).

Figure 24 Barriers of an AF campaign



Source: Survey of users. In your opinion, how important are the following "entry barriers" for projects to list on crowdfunding platforms? (n=55)

Lack of awareness

The Eco-system players and fundraisers interviewed indicated the **lack of specific know how and information** on how AF works, in general, as well as on different alternative finance models as one of the main entry barriers when listing on a AF platform. In this respect, respondents stressed that understanding how AF may apply to specific innovation and research projects is crucial for listing successfully on a platform. They added that a lack of knowledge or understanding of the economic mechanisms behind a platform can represent a limit/barrier for fundraisers - about one-third of respondents in the survey of users considers lack of information as an important barrier (76% of answers 5-7).

In connection with the latter, fundraisers highlighted a lack of neutral and user-oriented information adding that *there is too much general information, and available information is mostly related to a specific platform*.

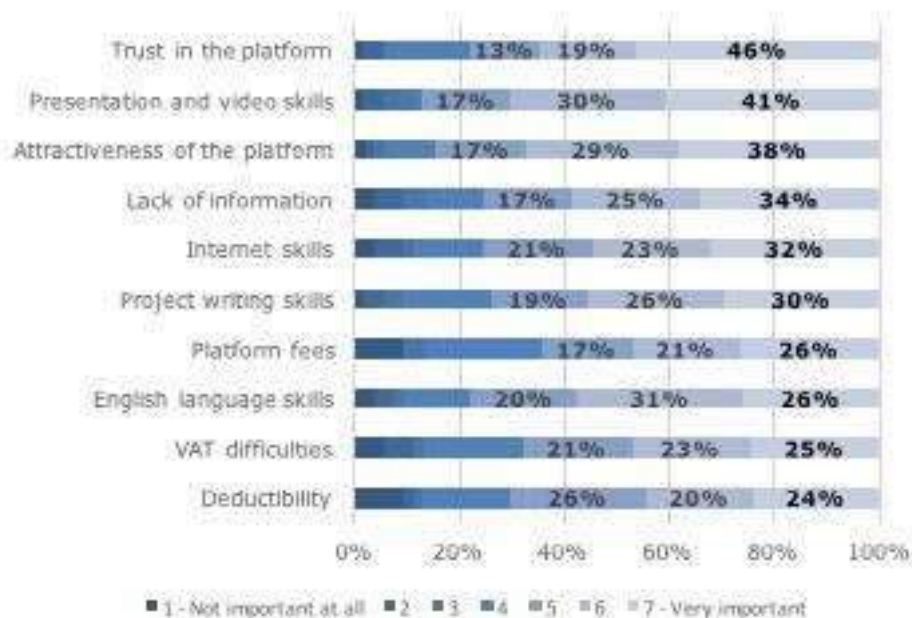
Credibility of the platform

After presentation and video skills, the **trust in the platform** was considered as one of the most important barriers by surveyed fundraisers. About 78% of respondents (answers 5-7) of the survey of users believed that a platform's trustworthiness is important. Especially, with regard to research-oriented AF platforms, stakeholders stressed the importance of guidance on which AF platforms are credible and suitable for R&I projects.

Transparency of AF platforms

The transparency, understood as transparency of the AF platform operations (information displayed about number of projects, success rates, fees, credit scoring etc.), was reported as a key issue in encouraging the use of AF, and AF for R&I. When asked about information and transparency, and the actions that platforms should take, **nearly two-thirds of fundraisers** (current and potential) agreed that to at least some extent (and about 29% totally agreed) **platforms should be more transparent**.

Figure 25 User perspectives on information and transparency



Source: Survey of users. Please state how much you agree with each of the statements (1 - Totally disagree to 7 Totally agree), n=55

From another perspective, the risk of fraud could strongly limit the transparency of platforms. More than 80% of surveyed fundraisers agreed that, at least to some extent (and 35% totally agreed), platforms should protect investors more against fraud. Furthermore, nearly two-thirds of fundraisers agreed that platforms should conduct some sort of risk assessment (23% totally agreed) or pre-screening (24% totally agreed) of projects.

Complexity of AF

During dedicated FGs, fundraisers mentioned that the **complexity of AF** in comparison to traditional financing, constitutes a major limitation, adding that finding the time to understand AF and to prepare and run a campaign is a challenge.

One of the interviewed stakeholders pointed out that *"entry barriers depend on the AF model adopted, meaning that risk-oriented AF models (e.g. equity based) that require a risk assessment by the project owner or by the platform before listing and launching a campaign, imply higher entry barriers"*.

Lack of resources

Moreover, some interviewed stakeholders highlighted the **economic factor** as a potential entry barrier for fundraisers, claiming that the preparation of the AF campaign (e.g. preparation of video material, launch of campaigns on social networks, hiring an AF expert) require significant time and economic resources. Surveyed fundraisers (current and potential) were less concerned with platform fees (see section 3.1.3.1) and considered them as one of the less important barriers.

Lack of sufficient integration of AF into financing pipeline

Finally, stakeholders participating in the FGs and European Policy Workshop highlighted that AF is still not integrated enough into local financing ecosystem. The sustainable redirecting and partnership links between different types of financial actors and intermediaries are still missing, and fundraisers do not have a clear view on when to use AF (at which stage of project growth), and what steps of financing to follow after and before AF.

4.2.2.1 Disclosure and IPR protection issues

The issue of the disclosure of a project idea is considered to be a barrier for potential fundraisers. **Protecting Intellectual Property Rights for R&I projects is important for both current and future fundraisers, though other groups of stakeholders tend to underestimate the importance of the issue.** Although over 56% of surveyed fundraisers agree that, at least to some extent, AF platforms should protect intellectual property rights more, and 41% claim that information sharing could be bad for their venture, other stakeholders stated during interviews that fundraisers are not very focused on the issue of IPR.

With regard to the potential problems in acquiring or protecting IPR for R&I projects funded via AF, the AF platforms interviewed mainly denied any specific issue. In case of a lack of legal protection, fundraisers can just avoid disclosing the information they want to protect: *"If fundraisers own a trademark then there is no problem; if they have any secret information they don't share it during the campaign"* stated a Finnish platform.

Nevertheless, there is anecdotal evidence of problems in IPR management, as in many cases of "open innovation" initiatives (Wells, 2013). For instance, the TikTok Lunatik watch kit successfully raised one million dollars on Kickstarter but was copied even before it went into production, and the market is flooded with fake Lunatik products. In another case, a student was successfully raising money for a 3D printer, but was then sued by a company for patent infringement. A previous study reported that "20% of project owners responding to the questionnaire signalled that the risks of insufficient intellectual property protection were too high" (European Commission, 2014).

Many investors considered that fundraisers should be in charge of the protection of their IPRs and that they should take care of this issue before listing on the platforms. For platforms, it seems to be difficult to regulate this aspect due to the diversity of the projects listed. Nevertheless, *"the platform has the responsibility not to disclose too much and to use part of the confidential information just for the credit rating"*, stated an institutional investor.

With regard to equity funding for R&I projects, some platforms request SMEs to have a patent before starting the campaign. Some platforms introduce a layered information process to protect fundraisers: 1) teaser with limited information, which is public, 2) more detailed info available for people who are members, and 3) the maximum level of information provided to identified people doing deep due diligence, usually the deal leaders.

5. INVESTORS

This section aims to analyse the level of participation by investors, and the drivers and barriers for it. The underlying goal is to understand whether AF is attracting new investors or rather providing new opportunities for existing investors; and to understand whether there are issues to be addressed in order to increase funding from both existing and new investors.

Key findings of the section:

- Innovation projects tend to have a smaller number of backers with a higher average amount invested, whereas research projects have a higher average number of backers with a lower average amount invested.
- The role of institutional investors remains limited when it comes to AF for R&I.
- Professional investors use AF platforms to test market potential of projects before placing higher investments outside AF platforms.
- Factors that drive investors to use AF: expected higher financial returns, disappointment and mistrust of traditional finance options, diversification of portfolio, risk sharing and due diligence, project validation by the market, personal motivations.
- Criteria to invest in an AF project: R&I project-related factors (size and scope of project, R&I stage of project), team composition and platform's effectiveness, personal motivations and interest in the project.
- Barriers for investors:
 - 1) Ecosystem-related risks (reliability of the form of investment and lack of regulation),
 - 2) Project-related risks (financial aspects of projects, lack of collaterals, general liquidity of the market),
 - 3) Fundraiser-related risks (lack of expertise and management skills),
 - 4) Investor-related risk (no real understanding of the potential of the product raising money),
 - 5) Platform-related risk (asymmetry of information, manipulation of credit scoring, and inappropriate due diligence checks),
 - 6) Exogenous factors (e.g. new market players and actors in the competition, the negative conditions of the economy, regulatory changes).
- For equity and lending AF, investors prefer investments on local AF platforms as different alternative finance regimes make investing cross-border riskier in terms of market knowledge, legal costs and complexity of the liability proceedings.
- Transparency of platform operations is considered as a priority area for improvement.

5.1 Overview

The growth of the alternative finance market is attributed to the growing number of investors that invest through alternative finance instruments. According to (Oxera, 2015) both, lending and equity platforms, reported the growing number of investors. However, the total number of investors, as well as investors in R&I, is impossible to estimate since platforms are far more protective about data on investors than they are about fundraisers.

According to the survey of platforms, the average number of investors, by interviewed platforms with R&I scope (generic and R&I-oriented), is 42,938 (n=39). The median platform has 1,300 investors. Surveyed platforms indicated the minimal number of investors as 30.

According to platform data analysis, on average, innovation projects tend to have smaller number of backers (26) with a higher average amount invested (EUR 185), whereas research projects have a higher average number of backers (around 34) with an average amount backed of around EUR 155. This is confirmed by other studies ((Startup Europe, 2014) and (Cambridge-KPMG, 2016)),

though the average amounts backed by equity crowdfunding seem to be considerably higher than those resulting from our platform data analysis.²⁸

5.1.1 INVESTORS' MOTIVATION TO USE AF

Diversification, due diligence, validation from consumers and risk sharing are the main factors driving the decision by investors to use AF platforms (Gajda & Mason, 2013). Investors can benefit from market signals, diminish the risk associated with single big investments by being able to place small investments and use a rationalised online system for decisions (in case of P2P lending platforms).

Moreover, **expected higher financial returns** and **disappointment/mistrust in traditional finance** are considered to be important drivers behind investing through AF (Oxera, 2015). Indeed, the participants of the focus group confirmed that a main driver for larger investments in innovative AF projects is return of investment.

Finally, **personal motivations** and interest in the project are important for investors. There are, however, differences between the motivations of investors of different AF models. The need to carry out a of charitable deed is more related to the rewards and donation funding models, thus more related to funding research. Whilst being interested in the project and a company is one of the main motivators for equity crowdfunding, and therefore innovation (Oxera, 2015), it is not the main driver for P2P lending (where all the factors are equally important). In this regard, a Belgian investor clearly differentiated between the motivations behind charitable donations and investments: *"If I am an investor, I will look into the sector and see if it is growing and whether I can see a market opportunity in it. If I am an individual who believes in your project, then I am giving you some money because I care about your idea, your cause, and because it is important to me."*

5.1.2 INSTITUTIONAL INVESTORS AND AF

Institutional investors (pension funds, mutual funds, asset management firms and banks) are entering into peer-to-peer lending and equity crowdfunding in Europe. Moreover, venture capitalists and business angels have started to invest on equity-based platforms²⁹ and further institutionalisation is expected. Some predict that in the next 10 years, most of the venture capital will include alternative finance in their portfolio (European Commission, 2015). However, not much data relates to AF for R&I.

Yet, the role of institutional investors remains limited when it comes to AF for R&I. Institutions were responsible for only 24% of investments in peer-to-peer consumer lending and 24% of peer-to-peer business lending investments came from institutional investors. In contrast, only 8% of the investment in equity-based crowdfunding (that is associated more with investing in R&I) was funded by institutional investors (Cambridge-KPMG, 2016). The low level of participation from institutional investors in AF for R&I is confirmed by the results of the survey of platforms. Surveyed platforms declared that, on average, 5% of investors on their platforms were institutional investors (n=35) and more than half of platforms reported not having institutional investors registered.

Highly specialised and capital intensive sectors such as nanotechnologies, advanced manufacturing or space might be more suitable for institutional investors due to the fact that the projects in these sectors are too complex to be easily understandable by the "crowd", as noted by those stakeholders interviewed. During dedicated FGs, investors claimed that complex science projects lasting between 15-20 years, are not of their interest, as they invest in undertakings with the possibility of a return on investment (exit) within first 8 years of investment.

Furthermore, professional investors use AF platforms to test the market potential of projects before placing higher investments. In that case, alternative finance is perceived as "proof of concept" funding. Often, investors first place smaller investments to test the emotions, feedback and development, and higher investments follow if the campaign reveals to be successful.

²⁸ According to (Cambridge-KPMG, 2016) equity based crowdfunding campaign had on average around 144 backers with an average investment of over EUR 3,200; for web entrepreneurs (Startup Europe, 2014) reported average amount of EUR 2,150 invested in equity crowdfunding projects by 52 investors on average.

²⁹ For example, angel investor Gil Penchina, a former eBay executive turned angel investor, recently put together a pool of investors to make equity investments in companies raising money through Indiegogo; Article from Quartz <http://qz.com/389001/once-idealistic-crowdfunding-is-now-an-unholy-hybrid-of-retail-investment-and-risk/>

5.1.3 AF INVESTMENT CRITERIA

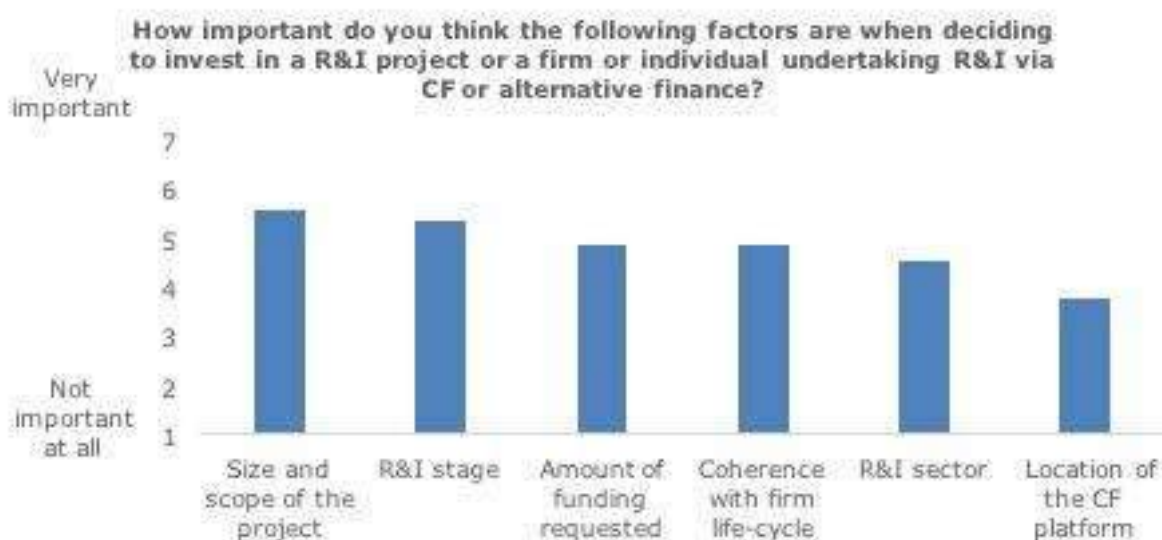
Investments in AF are mainly driven by a return on investment, philanthropic / personal motivations and R&I project-related factors (size and scope of project, and its R&I stage).

"...it depends on the phase. At the beginning, the motivation is to help the fundraisers to start that project. There is more idealism and interest in having that research being conducted or having that product of innovation being developed. When the phases are progressing the motivations of backers are different and are more market-oriented, but of course it depends also on the AF model involved" - a Dutch expert explained.

Project-related factors

The majority of interviewees identified the **size and scope of projects** along with the **R&I stage of project** as the most important factors assessed when deciding to invest in project via AF. Beside these two aspects, investors usually assess the **project's coherence with the firm's lifecycle** and the **amount of funding requested** (Figure 26). The latter is seen as important because the estimation of funding requested provides investors with key information on the concrete credibility and feasibility of the project.

Figure 26 Factors influencing investors backing a R&I project via AF



Source: Interviews (38 respondents including 14 investors, 10 platforms, 14 innovation eco-system players)

Other criteria used by investors include:

- **Credibility of the project:** "...currently when someone hears the word "crowdfunding" they immediately think about a "crazy" project but, of course, when you talk about a project in Research and Innovation, you are talking about a "serious" project, so there is a problem of credibility," observed a lawyer specialised in supporting AF platforms.
- **Application domain of the project** - some application domains are more suitable for AF than others, because of the amount of money needed for their launch or implementation.
- **The existence of the legal entity** behind the project - an investor is more likely to support a campaign of a company than of an individual person not having an established legal entity.

Different types of backers have different motivations. Interviewees agreed that there is a discrepancy related to the AF model used: an investor would be motivated by the return of the investment, the payback period and the understanding of the project, whilst a donor would be motivated by philanthropic and social factors.

Fundraiser-related factors

Investors look at the **team composition**, whether they are experienced and credible, and the **existence of a network** and a partner in the project (e.g. universities, individual researchers with a strong specialisation in the field).

Platform-related factors

According to investors participating in the focus group, they are more likely to place investments in **successful platforms**, and convincing quality indicators are the overall project success rate and the overall funding success of a platform. Moreover, the quality of the AF platform is also an important factor for making cross-border investments, as knowledge about national regulation is crucial.

Furthermore, stakeholders also mentioned the location of the platform as a factor that has an impact on the decision to invest, due to heterogeneity and complexity of national regimes. Finally, investors look at the involvement of other investors (including the lead investor).

5.2 Bottlenecks

Though the list of barriers and risks is long, the investors that were interviewed were concerned predominantly with the following risks of AF for R&I:

- Ecosystem-related risks: reliability of AF investment in general, fragmentation of the market and lack of AF regulation, underdeveloped links with institutional investors.
- Project-related risks related to financial aspects of the project (risk of collateral and underdeveloped liquidity of the market).
- Investor-related risk: not enough early market knowledge, lack of understanding of AF in general, and a lack of understanding of the project and its risks.
- Fundraiser-related risks: team behind the project, their skills and credibility, type of the company and its sector of operations.
- Platform-related risks: asymmetry of information, credit scoring and due diligence issues, transparency of platform operations (lack of clarity about selection process).

Ecosystem-related risks

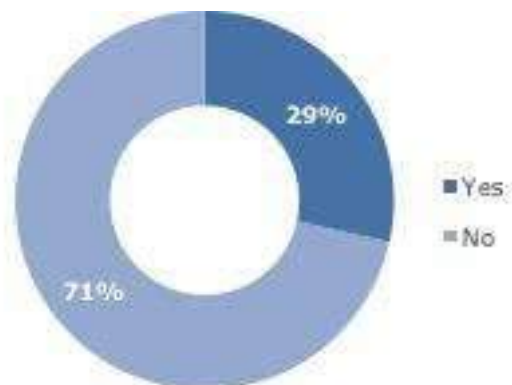
According to the literature (Oxera, 2015), investors in AF are mainly concerned with the reliability of this form of investment. This, together with the lack of platform regulation is the main reason for not investing in AF.

Project-related risks

Project risks resulting in **losing money or late payments** are at the centre of investor considerations. In particular, interviews stressed that the chance that a project in a prototype phase launched on a platform will never be commercialised – and that hence will not gain money from sales – should be always taken into account when it comes to R&I projects. This is connected to another risk factor- lack of sufficient information on the project.

To address the risk of lenders, some of the platforms insure lenders against the risk of default by borrowers. According to the survey of platforms, only 29% AF platforms claimed that they insure lenders against risk of default.

Figure 27 Platforms insuring lenders against default risk



Source: Survey of platforms. Does your platform insure lenders against the risk of default by borrowers? (n=14)

Insurance companies are entering the market of insuring alternative finance lenders. AIG insurance company introduced equity crowdfunding insurance for investors in 2016 (Hurst, 2016). Platforms can address the risk in other ways, for example, by securing loans with collateral, or by setting up a 'contingency' fund (Oxera, 2015).

With regard to the **financial aspects of projects**, according to investors, the main risks relate to the **lack of collateral, the general illiquidity of the market** and to the fact that start-ups are characterised by uncertainty regarding return of investment. Up until now, there have been only a few exits on the AF market, e.g. E-car Club (UK), Cups and some sugar (DE), ReWalk Robotics (IL)³⁰, Foodist (DE)³¹. Thus, there is no clarity as to the process and the size of the return, and the infancy stage of the secondary market development adds to the ambiguity. With regard to innovative start-ups, however, one institutional investor stressed that the risks related to these companies present a strong pay-off: these companies indeed can be very successful due to the disruptiveness of their ideas or simply due to the fact that they fill in some gaps in the market of products and services. Investors of the German platform, Companisto, made a 45% return on their money when the 'Cups and some sugar' project offered to buy back the shares.³² OurCrowd (IL) investors received over five times the value of their original investments when ReWalk Robotics was listed on the American stock exchange.³³

Fundraiser-related risks

In relation to the team behind the project, investors and platforms interviewed, agreed that risks could be related to the **lack of expertise and management skills** by fundraisers. For **research projects**, risks are related to the fact that most of the time, the researchers lack "entrepreneurial spirit" and are not strongly oriented towards the generation of revenues. For **innovation projects**, a VC also stressed that risks are related to "*the type of company and sector of operations*", adding that "*a service company could be riskier than a product company, where people can see the sales numbers*".

Investor-related risk

The possibility that investors do not really understand the potential of the product raising money is another risk of AF projects, according to the interviews. In addition, not enough early market knowledge, especially for highly complex R&I projects, was highlighted as the major issue by investors participating in the FG.

Platform-related risk

There is a big concern with the **asymmetry of information**, with professional investors having access to better deals than unsophisticated investors. Moreover, in case of a co-investment model (with VC fund participation), platforms might use their superior information to generate better investment opportunities than the investors participating through its platform. Some platforms have implemented a rule to prevent this, but generally do not hinder additional deals being made outside of the platforms (Oxera, 2015).

Credit-scoring and due diligence is considered as another risk factor. Investors base their lending decisions relying on the appropriate credit scoring information provided by platforms. However, credit scoring information might be manipulated by the platform itself or platforms might perform due diligence checks inappropriately. In addition, the intention of some platforms to conduct the **risk assessment autonomously**, may lead to a partial understanding of all the risks related to the project.

In line with the opinions of fundraisers (section 4.2.2), investors are concerned with the transparency of platform operations. Transparency in their operations and the level of user support were aspects highlighted by stakeholders as areas for improvement for AF platforms. Interviewed investors and innovation eco-system players stated mainly that **AF platforms should be more transparent in their operations** in order to encourage people to invest their money. They also agreed that AF platforms should provide more guidance to the ventures.

Exogenous factors

On top of these risks, an institutional investor recalled the existence of **exogenous factors** (e.g. new market players and actors in the competition, the negative conditions of the economy, regulatory changes) that can be influential and affect both the AF campaign and the returns on investments.

Other risks identified through literature review include:

³⁰ (Weeks, 2015)

³¹ (Companisto, 2016)

³² (Companisto, 2016)

³³ (Weeks, 2015)

- Lack of control over share management – equity investors might face the problem of having no influence over the company share decision, thus facing share dilution or unfair share pricing.³⁴
- Fraudulent project behavior resulting in the loss of funds. Thus, the risk seems to be small in proportion to the number of AF campaigns. Most of the cases happen to appear in rewards-based crowdfunding, where platforms do not guarantee the background check of the fundraisers. For example, in 2014 a company WeTag (US) crowdfunded for a new technology consisting of a Bluetooth item locator that required no battery. Though the project pledged for USD 25,000, it had gathered over USD 500,000 before the campaign was stopped. After realizing that the technology does not exist, Kickstarter managed to stop the project and return money to the backers. In the case of another fraudulent project, a fantasy board game, most of the backers did not receive their money back (Gaffey, 2015).
- Raising insufficient funds – in a “Keep-it-all” kind of AF campaign, investors risk losing invested funds if the goal of the campaign is not reached. The funds collected (minus fees) are given to the fundraiser and it is up to him to refund the investors, if he has insufficient funds to meet the project goals.
- Risk of platform failure after investing in the project.
- Money flow and control- AF platforms usually "control" the process of the monetary commitment of investors in the timeframe between an investor's commitment and the actual completion of the campaign. Depending on the applicable regulation, platforms choose to handle money from investors in a different way. Some platforms do not themselves manage investor money. They instead collect funds via third parties for further transmission; some establish client accounts in which funds are held. The question about investor money safety arises – which solutions are safe enough for investors and how their money is protected by platforms.
- Deal flow & investor management- the remuneration model in most of the business models of the AF platforms have evolved over time and increase the risk of conflicts of interests. Most platforms are remunerated based upon successful AF campaigns. These "success fees" are independent of the eventual success of the business venture. In the short-term, platforms might have the incentive to offer a high number of unprofitable ventures to the market.
- Data collection: for instance, Italy, Spain and the UK require equity AF platforms to collect information regarding the wealth and financial knowledge of individual investors, which in the case of European level transactions hits the barriers of national data protection laws.

Many of the risks listed in this section are already addressed by EU-level regulation or national regulations, whilst for other risks, it is for platforms themselves to ensure that they are mitigated. For instance, to obtain the MiFID authorisation, and under the most bespoke national regimes, platforms have to assess the investor's experience and knowledge. Some platforms require investors to pass a test before investing in a company, to demonstrate skills and risk awareness. In addition, platforms try to mitigate those risks by bringing sophisticated investors on board, pre-screening projects, being transparent in disclosing information on the credit scoring of lenders, publishing past performance data and raising transparency and awareness about how platforms work (Oxera, 2015).

5.2.1 BARRIERS TO CROSS-BORDER INVESTMENTS FOR INVESTORS

Overall, during the FG, **investors expressed the opinion that they prefer investments in combination with a platform in the same country**, as different alternative finance regimes make investing cross-border riskier in terms of market knowledge, legal costs and the complexity of the liability proceedings.

Investors did remark, however, that between rewards and donation-based crowdfunding, and equity and lending AF there is a difference. For the latter, different regulations and legal uncertainties, hinder cross-border investments.

³⁴ An interesting case is the ‘News Monkey’ project successfully funded by investors of Belgian platform MyMicroInvest (BE). After two years the company decided to go private, offering investors the EUR 11 per share price that was lower than EUR 20 per share capital increase that was carried out. After deducting platform fees, the investors were left at a loss (<http://www.demorgen.be/tvmedia/crowdfunders-newsmonkey-dreigen-met-rechtzaak-dit-kan-einde-betekenen-voor-crowdfunding-in-belgie-b3b8c02c/>)

Due to different legal regimes of countries, investors are faced with liability risks associated with cross-border operations. According to (CrowdfundingHub, 2016) the regulatory framework is mostly distinguished from the civil law framework. Yet, the investors should get familiar with both of the frameworks of the country in which they intend to invest. In addition, when faced with liability proceedings, investors can face the issue of disputing which civil law regime applies. As a result, uncertainty about the applicable liability regime might appear. Although, the EU has designed the system helping individuals and business in cross-border disputes, the possible cost and length of legal proceedings makes investing cross-border riskier.

6. ECOSYSTEM

Whilst it is important to recognise and consider the different perspectives of the stakeholders involved in a two-sided market such as AF, it is equally important to acknowledge the systemic nature of innovation. There is wide consensus that ecosystem dynamics are at the heart of a successful innovation policy. In this section therefore, we analyse the integrated ecosystem as a whole, analysing the existence and strength of links between the different players.

The underlying goal is to understand not only the role of AF in isolation, but if and how it is integrated with other support services to innovation and with other financial instruments.

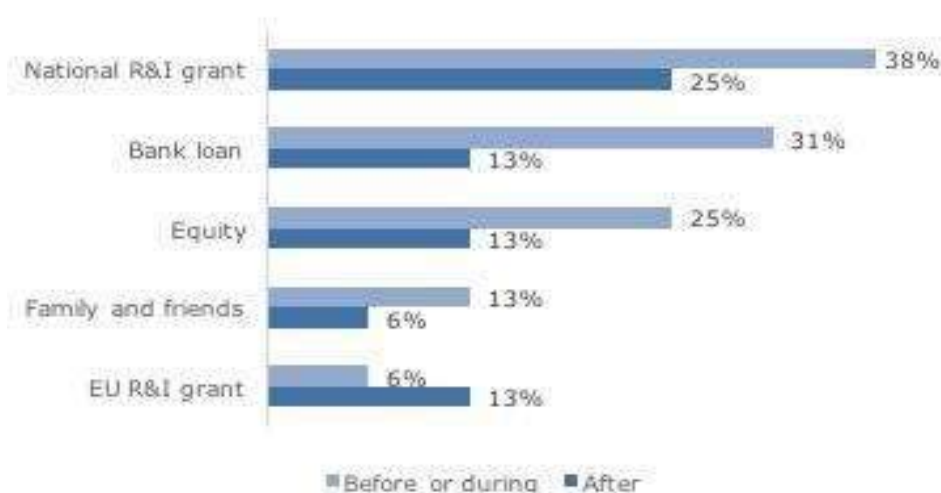
Key findings of the section:

- AF is a supplementary rather than an alternative option to other sources of financing for R&I, yet having some leverage effect (about 63% of fundraisers tried to get funding from other sources before or during AF; 50% did so after AF)
- AF is considered as a way to bridge the equity gap, something that can be observed at the seed stage, but is also seen by some as a way to promote further development, commercialisation and the growth of innovation-oriented projects.
- Incumbent players, such as banks, venture capitalist and business angels channel their investments through AF platforms, by building collaborations with existing platforms in order to make use of potential synergies, or setting up / acquiring their own platforms.
- AF platforms for R&I collaborate mainly with accelerators and incubators (48% of surveyed platforms), business angels (30%) and banks (29%).
- There is a growing consolidation and institutionalisation of the AF sector – 48% of P2P consumer lending platforms, 22% of P2P business lending and equity crowdfunding indicated at least some level of institutional ownership (Cambridge-KPMG, 2016).
- Fintech is going to positively affect the growth of AF, including AF for R&I – the growing popularity of Fintech solutions, moving towards analytics-oriented AF platforms and block-chain technology to improve the transparency of platform operations.

6.1 AF and financial pipeline for R&I

AF is perceived as supplementary rather than an alternative source to other ways of financing for R&I. About **63% of fundraisers tried to get funding from other sources before (or during) AF; less (50%) did so after AF** (Figure 28 below). A national research grant was the most common source of funding both before (38%) and after (25%) AF, followed by bank loan (31% before, 13% after). The EU R&I grant (standing here for programmes such as: FP6, FP7 and Horizon 2020) was obtained only by 6% of the surveyed fundraisers and 13% of them received an EU level grant after AF.

Figure 28 Other sources of finance before and after AF



Source: Survey of users. Before or during the campaign, have you tried to get funding from other sources? After the campaign, have you tried to get funding from other sources? (n=16)

A recent survey performed by EASME³⁵ amongst the SME Instrument Phase 2 beneficiary companies revealed that AF was one of the least popular sources of funding for funded SMEs, thus AF was used as a supplementary, rather than complementary, option to other sources of financing.

Figure 29 Indicated financial resources for further project development (several replies possible)



Source: EASME internal statistics, 2016

Moreover, AF is considered as a way to bridge the equity gap, something that can be observed at the seed stage, but that is also seen by some as a way to promote further development, commercialisation and growth of innovation-oriented projects. In this respect, some interviewed eco-system players perceive **business angels** and **VC** along with **other institutional subsidies and government measures** as a valid **alternative to AF for financing innovative firms and SMEs**. AF solutions offer the biggest choice of alternative finance platforms in the start-up and growth phase, hence they provide additional funding to the companies looking for ways to scale-up and grow internationally.

Investors and platforms mention a leverage effect of AF. Notably, **obtaining initial funding through AF platform attracts further investments from professional investors, business angels and institutions that follow the "crowd"**. As discussed before, success of the AF campaign has a signalling effect for investors in the potential of a project. Moreover, during the focus groups, stakeholders confirmed that a successful AF campaign is very useful in getting a bank loan later on. Although the size of the leverage effect would need to be further explored, the mechanisms are likely to be similar as to the one functioning whilst attracting business angel investment.³⁶

³⁵ Executive Agency for Small and Medium-Size Enterprises

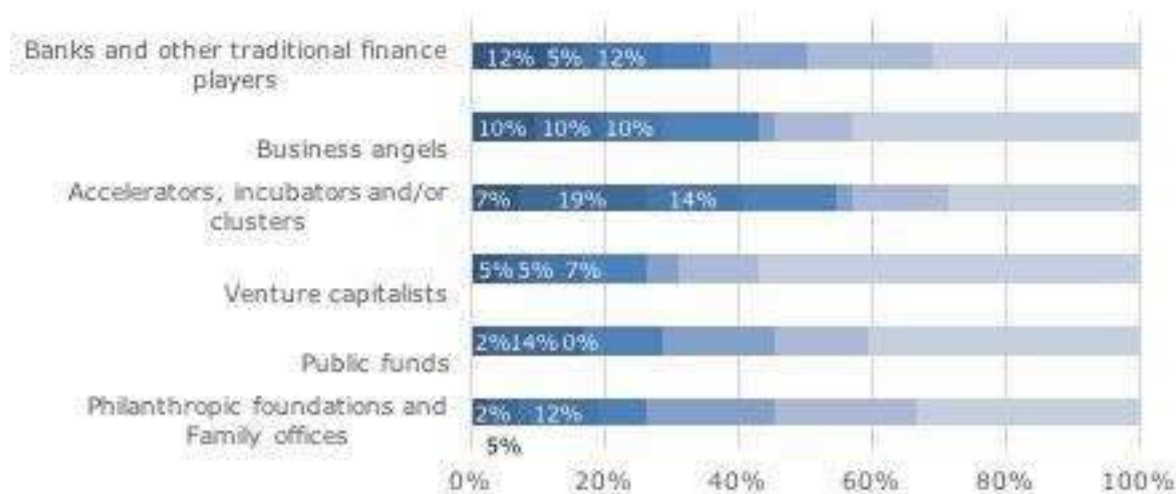
³⁶ According to the Business Angels Europe, attracting business angel investment has five times the leverage effect on further financing (BAE presentation during SME Assembly 2016, Bratislava)

6.2 AF and financing ecosystem

Incumbent players, such as banks, venture capitalist and business angels channel their investments through AF platforms, either by 1) building collaborations with existing platforms in order to make use of potential synergies, or 2) setting up / acquiring their own platforms.

As far as collaboration is concerned, surveyed platforms indicated to be collaborating to a very large extent mainly with banks (12%) and business angels (10%). **When considering collaboration to a medium-large extent, accelerators and business angels become more important. The collaboration between platforms and venture capital is still small (18% in 5-7 answers) according to platforms in connection with R&I.**

Figure 30 Eco-system players



Source: Survey of users. To what extent is your platform collaborating with...? (1=to no extent; 7=to a very large extent); n=42

Banks

Banks form strategic partnerships with AF platforms as well as set up their own lending platforms. ABN Amro has launched the Dutch AF platform Seeds. A mobile bank, Hello Bank! launched an AF platform Hello crowd! in cooperation with Ulule (FR) crowdfunding platform. Robobank (NL) is in the trial period of building an online platform (Rabo & Co) that brings together businesses and its private Banking customers. Rabobank itself will provide at least 50% of every loan (Rabobank, 2016). The bank is also discussing with Oneplanetcrowd (NL) and Collin Crowdfund (NL) the possibility of referring the bank customers to the crowdfunding platform. The cooperation covers only loans.

The French public investment bank, Bpifrance, set up the TousNosProjets.fr, an online platform creating a French alternative finance marketplace. This platform brings together all of the projects currently raising funds and is sponsored by French operators authorised by Bpifrance. The bank supports AF by publishing details of 1,380 projects from 33 donation, loan and investment platforms (Business France, 2015).

Belgian bank Belfius has recently partnered with Angel.me, a new Belgian platform. The bank will organise events with Angel.me and will also direct entrepreneurs to the platform. In Belgium, MyMicroinvest has established a strategic partnership with the bank that refers the ideas that are not successful in receiving the loan to the AF platforms. An additional intention behind this is to assess the feasibility of risky projects through the "crowd".

In 2014, Funding Circle and Santander announce a partnership to support UK businesses. It is a pioneering collaboration between a UK bank and an online alternative finance provider to give thousands of small British businesses greater access to finance. They launched a USD 100 million venture capital fund for financial technology firms to provide them with start-up finance and to ensure their customers benefit from the latest know-how and innovations in this sector (Santander, 2014).

Business Angels and Venture Capital

Crowdfunding covers a number of advantages for business angels and venture capitalists, who can benefit from market signals as consumers express their preferences through their online contributions (ECN, 2014). According to the eco-system players participating in the FG, for research and innovation projects business, angels start entering when the basic funding amount is reached. Crowdfunding can be seen as a step before BA investments. Attracting business angel investment means that visible crowd-investing moves into a non-visible business angel market. According to European Business Angel Network, visible funds raised by business angels and informal investors in early-stage investments constituted only 10% of the total funds raised in 2013 (CSES, 2015). As discussed in section 0, investors use alternative finance to invest smaller amounts and test the potential of the projects, and later follow up with the bigger investment outside of the AF platforms (also to avoid the fees charged by the platforms).

From a platform perspective, there are currently two developments with regard to cooperation with BA: 1) companies on the AF platform ask for a further business angel investment, 2) BA sets up a company, and uses an AF campaign to test market potential. If the campaign is successful, i.e. there is market proof, the investors invest further money.

There are several examples of alternative finance platforms that enable the "crowd" to invest in projects backed up by professional investors. Through the UK platform VentureFounders, experienced investors can join VCs and angels to invest in early-stage, fast-growth UK businesses, which have been vetted and backed by professionals.³⁷ The German crowdfunding platform, Deutsche Mikroinvest, offers investment opportunities solely for professional investors. UK platform, Investing Zone, enables investors to invest alongside corporate finance. SyndicateRoom, a UK crowdfunding platform, collaborated with Gust (the largest angel investment platform in the world) and Wayra (a leading accelerator) to enable individual investors to invest alongside BAs.³⁸ Similarly, AngelDen is a UK 'angel-led' crowdfunding platform, where the "crowd" invests alongside business angels.

Accelerators and incubators

Though platforms named accelerators and incubators as the major collaborators, eco-system players participating in the dedicated FG expressed the opinion that the links between them are still too small, and need to be further developed. Moreover, there is growing competition amongst AF platforms to set up sustainable co-operations with the best accelerators and incubators. The success of an AF platform depends on the quality of projects attracted by it, and there are not enough innovative projects with a large potential to satisfy the demand of the platforms. As stakeholders participating in the European Policy Workshop stated: "for research there is not enough money but enough projects, for innovation there is enough money but not enough projects".

The examples of collaboration between accelerators and alternative finance platforms include the previously mentioned SyndicateRoom and Seedrs. The UK Collider advertising and marketing tech accelerator started a collaboration with the Seedrs platform in 2014. The investors had to invest at least GBP 100 in ten Collider's start-ups (Baker, 2014).

Accelerators also provide training for start-ups on how to raise money from alternative finance. Westminster Impact Hub, for example, set up Raise Impact³⁹, a crowdfunding accelerator that trains entrepreneurs in raising money through alternative finance, providing a GBP 5,000 kick-start prize to one equity investment crowdfunding campaign.

Philanthropic Foundations

With regard to basic research, interviewed stakeholders stressed the importance of philanthropic funds (e.g. from foundations) as a channel to be explored for financing science. Foundations launch their own platforms or project crowdfunding sites, or work in collaboration with already existing platforms. Thus, it is worth noted, that alternative finance is treated as a supplementary way of funding for pure research projects, along with public grants and philanthropic donations (Osimo et al, 2015). During interviews, stakeholders stressed too that "*diversification of the portfolio, including other types of alternative finance, is essential for financing projects in R&I*".

In science, the hybrid of public-private crowdfunding is emerging. In the UK, MyProjects⁴⁰ which enables crowdfunding for research projects was set up by Cancer Research UK. In Germany, the ScienceStarter crowdfunding platform was launched by Wissenschaft in Dialog, an initiative from the German scientific community.

³⁷ Link to the platform: <https://www.venturefounders.co.uk/>

³⁸ Link to the platform: <https://www.syndicatoroom.com/about-us/about-syndicatoroom>

³⁹ Link : <http://westminster.impacthub.net/raise-impact/>

⁴⁰ Link: <http://myprojects.cancerresearchuk.org/>

Matching AF with public funds

Crowdfunding platforms can also help public bodies to identify projects with financing needs and assess which project should be funded. Platforms raising funds for R&I are increasing links with public funding and other actors in financial ecosystem. There are examples of alternative finance platforms being used as a selection point to choose those projects to be funded by regional public authorities in the form of matching funds.

The concept of public co-investment (matching funds) is often combined with the requirement of the social impact for the local ecosystem. For instance, the City of Manchester #MakeMCR launched a crowdfunding initiative for Manchester, supporting ideas and projects from people that want to make better places and spaces in Manchester.⁴¹ Another example of a matching fund crowdfunding is Creative England campaign with Crowdfunder⁴² providing GBP 3,000 to successfully crowdfunded projects by female game-developers. On top of that, Crowdfunder has a dedicated section to matching funding projects.⁴³

Crowdfunding platforms can serve also as a way of distributing funds through a trusted provider that takes care of the pre-selection process. For example, Funding Circle, as a pioneer in cooperation with the European institutions, introduced GBP 100 million investment in loans to UK small businesses with the European Central Bank (EIB, 2016).

⁴¹ Link: http://www.manchester.gov.uk/info/827/growing_a_business/6285/crowd_funding_-_raising_funds_for_your_ideas

⁴² Link: http://www.crowdfunder.co.uk/competitions/how_it_works

⁴³ Link: <http://www.crowdfunder.co.uk/fundraising/match-funding>

6.3 AF and Fintech trends

Alternative finance can be considered as part of "Fintech" or financial technology, the industry using ICT technologies to make financial services more efficient, which is today one of the fastest evolving domains in technology and the one attracting investment. New trends such as big data analytics, alternative currencies and mobile payments are expected to drive innovation in the future and to deeply influence the alternative finance sector. Eco-system players stressed that Fintech is a rapidly evolving field that is going to have impacts on AF platforms and operations, including crowdfunding for R&I. **Growing consolidation and institutionalisation** of AF, moving towards more analytics-oriented platforms and an increase in the adoption of block-chain technology, are some of the observed trends.

"With people using more and more Fintech products, CF and alternative finance investments are going to grow, because it will become one of those financial products proposed by Fintech companies" observed a Belgian funding expert.

Whereas alternative finance projects were more focused on B2C in the past, there is a growing shift towards B2B investments. The alternative lenders are becoming partners of larger traditional lenders, and banks are investing heavily, and creating their own Fintech accelerators. Following the growing trend of increasing collaborations between Fintech start-ups and incumbent players, the institutional investors are entering into peer-to-peer lending and equity crowdfunding in Europe as well.

Looking at the overall European AF market (ex. UK), with the exception of donation-based crowdfunding, invoice trading and rewards-based crowdfunding, crowdfunding platforms indicated a higher level of institutional ownership, with the highest levels in P2P consumer lending - 48% of platforms indicated at least some level of institutional ownership. Furthermore, 13% of platforms declared that traditional finance institutions (such as a bank) had a majority share and 10% indicated a venture capitalist or angel investor as the majority shareholder (Cambridge-KPMG, 2016). With regard to P2P business lending and equity crowdfunding, 22% of the platforms declared some form of institutional ownership (Cambridge-KPMG, 2016).

Secondly, with the advances made in technology and the rise of big data, there is a **move towards more analytics-oriented AF platforms**, where investors are provided with automated investment analytics for better investment decisions. The automation and algorithm-driven investments, as well as robo-advisors, will enter the alternative finance realm (Baldwin, 2016). Currently, 75% of bidders in P2P consumer lending and invoice-trading in Europe (ex. UK) use an auto-bid and auto-selection option (Cambridge-KPMG, 2016).

Thirdly, the **blockchain technology** is expected to have a significant impact on the entire financial industry, and financial institutions are exploring blockchain technology to work to the advantage of AF in Europe. According to an Estonian innovation expert, such technology - created to approve all transactions done with the virtual coin 'bitcoin', is going to lead to an improvement in terms of the transparency of financial operations, including those conducted on AF platforms. Blockchain technology allows for the creation of a public ledger that is always possible to consult and where every transaction ever done is registered. *"A more trustworthy system means, above all, to make small investments more viable and reliable, increasing the number of people keen on investing their money, even in innovative projects"* observed the expert.

In this respect, in 2016, several developments were announced in France. BNP Paribas Securities Services and SmartAngels (FR), an AF platform for start-ups and growing SMEs, have signed a strategic partnership centered around blockchain technology (BNP Paribas, 2016). In addition, BNP Paribas Securities Services partnered with renewable energy AF platforms Lendosphere (FR), Enerfip (FR), and Lumo (FR) in September 2016, announcing the further expansion of its blockchain platform for private stocks in order to allow private companies to issue mini-bonds through AF platforms (Hurst, 2016). Furthermore, Bolero Crowdfunding platform has launched the first European blockchain application game that enables the creation of a secondary market for AF investments (Mark, 2016).

7. POLICY RECOMMENDATIONS

This section builds on the challenges presented in the previous sections to develop specific policy recommendations relevant for each of the four dimensions (platform, fundraisers, investors, ecosystem). The starting point for the analysis was a list of possible policy actions in support of AF for R&I, produced by the European Commission. This list has been enriched and fine-tuned during the course of the study, based on the evidence gathered, the feedback from stakeholders through interviews and focus groups, and further validated during the final European Policy Workshop.

This section is structured in the following way:

- Firstly, the general problem for each dimension is described, and the underlying causes highlighted.
- Secondly, the policy options for each dimension are assessed, based on the feedback from stakeholders.
- Thirdly, the recommendations prioritised by stakeholders over the course of the study are summarised.
- The final recommendation of policy actions is based on cross-matching and inter-relating input from the four dimensions, and enriched with insightful policy examples from the country fiches.

It is important to note that in many cases the issues and recommendations are not R&I specific, but generic, as for instance the issue of AF cross-border investments and heterogeneity of national regulations. Whilst not being the main focus of the study, the study also includes such issues due to the relevance attributed by stakeholders: in these cases, the emphasis is on the peculiarity of the R&I perspective in addressing the overall problem.

Moreover, during the study, it has become apparent that there is a difference between the challenges of AF for research and for innovation. Therefore, the policy measures have been attributed to research or innovation, where relevant.

Finally, the study results reveal that many challenges for platforms, fundraisers and investors are closely interconnected and interrelated. As a result, the possible policy recommendations discussed for different dimensions may refer to the same solutions, though from a different angle. They are brought together in the final section.

7.1 Investors

7.1.1 THE PROBLEM OF UPTAKE OF AF FOR R&I BY INVESTORS

Whilst AF already offers an important contribution to R&I investment, Europe is lagging behind its world competitors in terms of total investment in AF, and the gap is growing rather than narrowing, as illustrated in section 2. This limited uptake of AF is particularly worrying since it appears to enhance, rather than mitigate, the existing gap in R&I financing. Europe lags behind in terms of total private R&D spending, in terms of overall risk capital financing, and especially in terms of private risk capital. Professional and institutional investors are starting to use AF platforms to test the market potential of their investments; yet the majority of investments come from individual, non-professional investors that are increasingly taking part in the market – albeit to a lesser degree than in other world regions.

At the same time, we should not forget the risks related to the increasing participation of non-professional investors. Therefore, the policy objective should not be purely focused on increasing the investment, but also on ensuring that it is carried out with adequate knowledge. Furthermore, because the focus of this study is R&I, the goal should specifically be to incentivise the investment into riskier projects.

The drivers that convince investors are different for different types of AF. Donation and rewards funding are mainly led by personal motivations related to life conditions, whilst investors in equity and lending are mainly driven by the financial return. Equally, research investment is driven by personal motivation, whilst investment in ventures closer to the market reflects the goal of financial return. In general terms, stakeholders agree that the innovation/equity/lending type of AF is less problematic than the innovation/equity/lending type.

There are many barriers to the limited uptake of AF by investors. During the course of the study, stakeholders highlighted following options as the most important:

- Platform's risk assessment of a project - is regarded as a priority aspect by investors and innovation eco-system players that can contribute to the increased number of investors in AF, and in particular in AF for R&I. It therefore represents the biggest challenge. AF is perceived as a risky way to invest money and consequently interviewees highlighted the need to assess the risk related to the projects listed on platforms.
- Lack of information on the AF market and on project-specific risks, in case of unexperienced investors.
- Lack of adequate information on the due diligence of the risks of the project, related to specific sectors and technology performance.
- **Lack of transparency of the platform operations**, in terms of methods to select the projects, ways to report success rates and returns on investments are big issues for investors.
- **Information asymmetry** - small investors fear that they do not receive the same level of information and access to the same deals as professional investors. Indeed, it has been confirmed by business angels that the big deals are closed outside of the AF market.
- The latter is correlated with the issue of **platform's overall reliability** - how to objectively assess which platforms are good and which not? Which ones have sufficient expertise in the area?

Moreover, for research, additional barriers have been identified:

- Lack of uptake of AF for research by investors and backers for science-related projects due to the complexity of the subject.
- The issue of a proper risk assessment of scientific ventures and skills of the team – not enough info on projects and the pre-selection process.
- Platform's scientific reliability – investors are missing info on which scientific platforms are reliable. In contrast to innovation, there is a lack of market signalling of AF science platforms.

7.1.2 DISCUSSION OF POLICY OPTIONS

In the section below, the possible policy actions address the majority of the barriers identified. Many of the considerations are equally important for AF and AF for R&I, though for the purpose of this study, the R&I perspective is stressed where valid.

EU guarantee and co-investment as a way to leverage project and platform-related risks for investors

Amongst the concepts that were welcomed by most of the stakeholders were **EU guarantee** and **EU co-investments** supporting investments as measures to increase the trust in projects by investors and to stimulate the uptake of the crowdfunding for research and innovation. In particular, platforms are very open to collaboration with the European Commission. *"EU guarantee and co-funding could be useful because institutional partners investing in AF with other investors are able to inject the confidence into the system and, as a consequence, this fact contributes to attracting and catalysing investment toward the AF."* In that sense, EU guarantee and co-investment stand for a sort of proof of quality for projects and platforms. To sum up, the concept brings benefits to platforms, investors and fundraisers.

- Whilst being backed by the EU, platforms benefit from increased reliability and trust as well as from increased attractiveness of their range of service offering for fundraisers and investors.
- Investors benefit from spreading their risk (guarantee) as well as from the project and platform quality signalling effect (by choosing specific platforms and projects, the EC signals the reliability of both).
- Fundraisers benefit from higher probability of attracting investments.
- Finally, the EC benefit from 1) attracting more funding to otherwise riskier projects 2) leverage effect of EU funding to generate more investments in innovation and science 3) market signalling effect – through platform / crowd pre-selection mechanism, the EC would be able to approach the distribution of EU funds from another perspective.

As far as lending platforms are concerned, a guarantee is highlighted as a more suitable option to reduce investor uncertainty in participating in innovative ventures. Co-financing by the EU was seen to be more interesting for equity-based investments as the way to leverage funding for early stage innovations.

Moreover, stakeholders agreed that at regional level, a guarantee scheme could be suitable, whilst at local level, co-investments would create more impact.

In both cases, the choice of platforms for collaboration should rely on a structured process (quality labelling) as discussed further below.

Increased transparency of platform operations

The need for increased transparency in the operations of AF platforms is mentioned as the key measure to increase the amount of funding raised via AF by stakeholders. Interviewees argued that the transparency of connections between donors and fundraisers is necessary to enhance and achieve higher levels of reliability and confidence within the entire operational setting. Transparency also seems to have a positive effect on the perception of the feasibility of investment, according to investors.

In that respect, most of the investors confirmed that a standard reporting method to inform about platform operations (in the form of a set of Key Performance Indicators (KPIs)) would be very useful because it *would* imply higher levels of transparency and allow for comparison between different platforms and transactions: *"This industry needs to be data driven to work, so the more data we have, the more people can analyse it. And the more we have data in a standard format, the easier it is to analyse it"* observed an US expert and investor, adding that the adoption of a standardised reporting method could enhance, and trigger the integration of the EU and US AF markets. *"Thanks to standardised reporting, one of the biggest problems in AF, that is transparency and potential conflict of interest, could be eventually resolved"* – regulator. Moreover, it would also enable the proper tracking of the alternative finance market. However, stakeholders agree that this development should mostly be left to market dynamics, since platforms have a great interest in providing as much information as possible to their investors. For example: The European Crowdfunding Network has developed a Code of Conduct for its members. Another example is the Code of Practice developed by the UK Crowdfunding Association.

There is also great consensus on the need for platforms to be transparent about the criteria they use to select projects. For instance, in Spain, based on the new regulation, platforms have to display clear information on the criteria they use to select and prioritise the projects.

EU excellence / quality signalling as a way to enhance the reliability of the platforms

The choice of AF platforms and projects by the EU for the distribution of funds to projects would signal their quality. This is particularly important for investors whilst investing on research-oriented platforms and/or in science-related projects, where specific expertise is needed to assess the reliability of platforms and the potential of projects.

Similarly, AF platforms receiving R&I projects redirected from the Horizon 2020 selection process would benefit from the EU proof of quality. That would help them out with the selection process of projects, and therefore, enhance the number and quality of R&I projects pledging on AF platforms. In return, better quality science projects would increase their uptake by investors.

As mentioned before, there is a need for a pre-selection of platforms to take place, according to the set of specific pre-set criteria, e.g. size of the platform (based on annual number of projects), experience in a specific branch of science / innovation, commitment to standardised reporting, credibility of the founders of the platform, professional background in a specific branch of science, existence of scientific/expert board of a certain level or whether or not the platform follows the AF industry specific Code of Conduct.

Pooling of R&I projects for risk mitigation

An interesting idea suggested by stakeholders was the creation of project funds for project pooling, where people could invest in a group of projects, also over different AF platforms. Investing in early stage companies is risky, but diversification can mitigate risk.

In this case, the EC could propose projects for funding, or support a fund for EC funded projects. For example, the UK Platform Crowdcube created the Crowdcube Venture Fund in 2014 (Crowdcube, 2014). Available only to Crowdcube registered investors, the fund allows investors to easily participate in a diversified portfolio of crowdfunded companies.

Platform pooling for quality signalling

The platform pooling for AF for R&I by the EC could also take a form similar to: TousNosProjets⁴⁴, a French marketplace for AF created by BPI France, where projects from 38 AF platforms are presented in one place. The platform provides guidance on how to use participatory finance and enables a comparison of different platforms and projects. The concept could be applied to AF for R&I, focusing on the choice of platforms according to pre-set criteria. The R&I-related platforms could be displayed on the European AF marketplace – redirecting investors and fundraisers to a platform of choice.

Financial education for raising the awareness of investors

There is a widespread agreement on the need for greater financial education and awareness amongst investors in AF, and AF for R&I. There is still too little knowledge about different investment opportunities, and the risk they entail. Market-driven measures have shown limited effects: some platforms have taken the matter into their own hands, delivering training and awareness videos for investors which admittedly have obtained limited impact.

For R&I, there is a need for clear guidance and explanation on which models are relevant for specific sectors / branches of science, and which risks they entail, e.g. investing in a wind-park might be a less risky infrastructure investment than investing in an ICT start-up.

Moreover, crowdfunding stakeholders mention that for equity crowdfunding *"...the best practices need to be developed as risk analysis cannot be performed on existing financial performance (unlike with debt) and risk is often linked to sectors and technology performance. Therefore, due diligence becomes a key aspect"*, suggesting that specific guidelines on the AF funding process should be developed to allow investors to make an educated investment decision. Many crowd investors still invest in something, and whilst signing a contract, they do not understand what they have invested in. Even though risk warnings are included, the risk is not always clear for the investors.

Tax exemptions at national level for investments in AF

Tax deductibility at MS level, aimed at increasing the general uptake by investors, was indicated as the preferred measure by the majority of investors, platforms and innovation eco-system players.

Member States are also looking into favourable tax regimes for AF, though they are scope of bigger tax packages. The UK tax schemes serves as the best practice example of a how tax deductibility increased the level of investment in AF.

In the UK, two types of tax incentives are associated with crowdfunding: the Enterprise Investment Scheme (EIS) (GOV.UK, 2013), which helps small, unlisted, high-risk companies to raise capital, and the Seed Enterprise Investment Scheme (SEIS)⁴⁵. The SEIS was created to provide tax relief to private investors who invest in early stage companies. It allows tax relief up to 50% of the cost of the shares and capital gains tax relief opportunities, including reinvesting gains from a taxable event into SEIS shares.

However, stakeholders during focus groups drew attention to the fact that the existence of tax exemptions only in some markets distorts the development of the rest of the crowdfunding markets. Thus, the question arises whether tax incentives might limit cross-border investments. There is a crucial role for the EC on the one hand to encourage and support the adoption of similar measures, and on the other to ensure that it does not evolve into additional barriers to cross-border investment.

⁴⁴ Link: <http://tousnosprojets.bpifrance.fr/>

⁴⁵ Link: <http://www.seis.co.uk/>

7.2 Platforms

7.2.1 THE ISSUE OF SUSTAINABILITY OF BUSINESS MODELS

There is no lack of AF platforms in Europe – the study mapped over 230 platforms relevant for R&I, either generic or R&I-oriented. However, most of them are concentrated in six Western European countries (with the UK representing over 75% of the market) and two thirds of them are generic platforms. With a few exceptions, most of the platforms are in the start-up phase with a turnover not exceeding EUR 500 thousand, and their business model relies on fees charged to fundraisers and investors. Platforms are striving to find a profitable business model and, therefore, the more general in scope they are, the biggest number of projects and investors they can attract, thus the more success fees they can earn. This is also the reason for a growing number of platforms with hybrid (mixed) funding model - as they are trying to accommodate projects with different needs for maximum effectiveness and efficiency.

Moreover, platforms strive to expand cross-border in the search of a profitable business model, especially those from smaller countries or countries with little awareness on alternative finance. However, whereas the barriers for expanding cross-border are limited for donation and rewards-based platforms, they are large for equity and lending platforms, due to fragmented national regimes.

Thus, the EC policy measures in this section should not focus on facilitating the business model of platforms, but rather on a broader perspective of 1) how to facilitate the creation of sustainable AF platforms, and AF for R&I in particular; and 2) how they can become an EU strong alternative for US counterparts (Kickstarter and Indiegogo).

The following challenges were highlighted by stakeholders as the most crucial for AF:

- Expanding cross-border - due to the problem of fragmentation in regulatory regimes, and the lack of skills amongst platforms on how to approach cross-border AF operations.
- Managing crowd liquidity – managing a sufficient amount of projects and available investors in a timely manner, as well as providing liquidity for existing investments (secondary markets).
- Assessment of the profiles of investors for correct project matching, and the issue of attracting lead investors.
- Cultural context of the country - cultural awareness of AF in the country, influencing attractiveness of the AF market for investors/funders, and the existence of the context open to innovation.

In addition, specifically for research platforms:

- Issue of a profitable business model for science platforms - donation and rewards-based science-related platforms are struggling to find a profitable business model and to cover costs of their operations, scientific-board costs in particular.

7.2.2 DISCUSSION OF POLICY OPTIONS

The section below includes policy options discussed with stakeholders during the course of the study.

Providing conditions for cross-border operations

Most interviewees commented that the regulatory fragmentation hinders AF cross-border operations because it does not reassure investors about the level of protection guaranteed to their investment, and about the types of operations allowed in another country. Particularly, a Belgian investor stressed the fact that: *"...the EU should provide the conditions for a pan-European platform to succeed in the market and to enable platforms to be established."*

Stakeholders mention that without EU action, national fragmentation will continue as each country is currently developing own AF frameworks, some more progressive, some more restrictive. It is likely that more and more platforms, mainly the bigger ones that can afford the extremely high legal consultation costs, will find individual ways to carry out cross-border investments, by setting up subsidiaries, or through MiFID etc. In this respect, some of the respondents interviewed were in favour of the harmonisation of the regulatory framework at EU level through the introduction of legislation on AF within the EU Capital Market Union.

However, during the focus groups, stakeholders suggested more soft measures in support of cross-border operations, such as the simplification and clarification of different national regulations with regards to AF.

Though, the MiFID Directive is perceived as positive development, the EU institutions should consider whether there is a case for an action at EU level to reduce the incentive to structure business models so as to fall outside the MiFID regulation. With this regard, where AF platforms are operating within the MiFID scope, the current EU-regime is considered to provide a reasonable degree of risk mitigation, but not where such platforms are operating outside the MiFID. In this case, the impact of the gap in terms of investor protection could be mitigated by measures at national level, but such measures would not provide an EU AF passport and would not address the lack of scalability.

One of the important aspects mentioned is the need for an EU-wide clarification of the role of the AF platform. In some countries, AF platforms are considered as a marketplace from a legal perspective, whereas in other countries they are defined as intermediaries/consultancies for financial services. In the R&I context, this is particularly important in view of the increasing connection between innovation support services (e.g. accelerators) and AF platforms.

The Platforms suggested that there is a need for European alternative finance guidelines on cross-border investments for platforms, and platforms for R&I, to enhance the understanding of different regulatory regimes and to raise awareness and skills. Currently, most platforms are overwhelmed when it comes to scaling up their market to a new country.

Finally, some stakeholders highlighted the need to implement a set of measures in order to make people aware of the risks stemming from AF cross-border operations, focusing for instance on sharing and updating information related to investment.

Creation of an EU-level platform

As far as the concept of the creation of an EU platform is concerned, there was limited support as the idea scored the lowest amongst the ideas discussed with the stakeholders. However, platforms argued in favour *"because such a mechanism could enhance AF at the supranational level and build connections amongst national platforms"*. According to a national regulator, thanks to such tools *"gaps and risks in cross border transactions could be avoided or mitigated, but it is doubtful that this idea could be feasible"*.

In particular, platforms expressed an interest in international collaboration and cooperation, e.g. they would be interested in building domain specific (e.g. energy sector) networks of international partners and platforms to share projects and communities. By doing this, existing communities could be better exploited and cross-border activities enhanced. Again, the EU platform could take a form of a modified version of the TousNosProjet.fr. project, endorsing certain R&I-oriented platforms as being valid for cross-border operations.

EU support to science-oriented platforms for sustainable business models

Research-oriented platforms state that they should operate on the market basis. Thus, the direct funding for the EC would destabilise the market. However, scientific platforms would appreciate help in managing the costs of the scientific boards, e.g. in the form of grants for the creation of scientific boards. This, however, does not have to be done through direct funding only. The EC could redirect projects from the Horizon 2020 evaluation process to science platforms solving the issue of their own pre-selection process. The idea was welcomed by platforms specialised in science-related projects.

Nevertheless, stakeholders were sceptical that the "signal" of reaching the threshold could have a real impact in convincing investors about the validity of the project, since there is limited knowledge about the evaluators of the EU projects.

Sharing the Horizon 2020 expert database

The indirect support could also take the form of the EC opening the database of Horizon 2020 experts to R&I-oriented AF platforms, allowing them to use their potential.

7.3 Fundraisers

7.3.1 THE ISSUE OF AWARENESS, LACK OF SKILLS AND LACK OF TRUST

According to the study, the estimated potential of AF for R&I was around EUR 755.1 million in 2015. It's big and it's small - although it's 11% of the Horizon 2020 annual budget, it is still only around 1/8 of the total AF market in Europe. The success of AF, and AF for R&I, depends on the success of its projects. The higher the number of projects attracted, and the better their ability to attract investors, the bigger the success of the AF platforms. In return, the successful projects create further hype and attract more fundraisers and investors. Yet, many fundraisers still do not trust this sort of funding options. Some are also not aware of them or are discouraged by the complexity of AF. This is notoriously the case for researchers and universities. This study reveals that only around 20% of successful projects on AF platforms deal with basic research. Indeed, the participants of the European Policy Workshop confirmed that with regard to fundraisers, the challenges are different for research and innovation as the stage of awareness of AF for start-ups vs. universities and researchers is much higher. The policy options in this section should, therefore, take into consideration different challenges that AF for research vs. AF for innovation faces.

Stakeholders prioritised the following barriers for AF for R&I from the challenges identified in the study:

- Lack of awareness of the opportunities of the alternative finance, and AF for R&I in particular: what it is, the types of AF appropriate for innovation vs. research.
- Lack of specific skills of fundraisers: communication and PR skills, video and presentation skills, business plan development skills, and lack of recommended list of providers for such services.
- Issue of trust in platforms – which platforms are suitable for which projects, and which platforms are credible for R&I.
- Leveraging the need of transparency of platform operations vs. confidentiality and IPR protection issues – funders are afraid to disclose their business idea.
- Complexity of AF in comparison to other financing options.
- Resource barriers – lack of initial resources (time and financial) for campaign preparation or hiring PR consultants.
- Lack of a clear understanding of how AF fits into the financing pipeline and lack of existence of the latter.

The lack of awareness of AF funding models and lack of skills, together with the need to build trust in AF platforms and in their operations in order to increase number of successful fundraisers, are the top issues mentioned by stakeholders for AF for R&I. However, stakeholders stressed the greater importance of awareness building for research, whereas sales and communication related skills were named as more pressing issues for innovation. Furthermore, for research, the complexity of AF in comparison to other financing options, an issue of matching AF with public funding, and the credibility of the specialised platforms were ranked as priority challenges. Conversely, for innovation, the issue of transparency vs. disclosure of information and economic factors were highlighted as being more important.

7.3.2 DISCUSSION OF POLICY OPTIONS

Education on AF for R&I that goes beyond informing

The stakeholders that were interviewed stressed that there is still a lack of awareness about AF and other methods of alternative finance, and that sharing knowledge and experience concerning the topic would be useful in order to get new people involved. Currently, the alternative finance market is not transparent and there is still a lot of work to be done in explaining the different models to fundraisers.

Guidelines for AF for R&I

Stakeholders agree that target specific guidelines for fundraisers and investors, highlighting the difference between donations and investment based AF models, as well as models suitable for R&I,

are necessary. Though, the EC has developed AF guidelines⁴⁶, not many people are aware of them. No guidelines for AF for R&I have been developed so far.

Training for fundraisers on AF and AF for R&I

Overall, platforms agreed that there is a lack of AF training possibilities, suggesting that there should be small and comprehensive training courses on making alternative finance more tangible for innovation projects, for researchers and for universities. They should also cover training on how AF fits into the public and private financing pipeline.

Based on the experience⁴⁷ from the Startup Europe Roadshow, stakeholders suggested that a similar concept of an AF R&I Roadshow can be applied to the dissemination of information on AF for R&I amongst research institutions and researchers.

AF Service Package for Research Institutions

Science platforms see a great potential in the cooperation with research and scientific-oriented institutions. Through public engagement, science can be promoted and the knowledge transfer to create innovation can be enhanced. Universities and research centres could step up behind some campaigns and communicate research results and prototypes to a wider public. This way, research results could reach a wide audience of interested people willing to build on such results and enhance innovation. To leverage crowd investments in research and science, AF could be used as a tool for science communication in order to impress the "crowd" with what scientists do. Thus, flagship science projects funded by public resources could receive further funding and enhance their impact. Similarly, the national research institutions could redirect science projects that were promising but were refused funding, to the specialised AF platforms, just the way the banks are cooperating with AF platforms by redirecting SMEs to them.

However, universities and research institutions are reluctant to use alternative finance for funding science, not knowing how to fit it into the public grant financing pipeline. Thus, stakeholders stress the need for EU action to enhance the uptake of AF through national research centres, universities and universities of applied sciences. The EU could provide **Alternative Finance Service Packages for Research Institutions** (national bodies / centres / universities) on how to use the potential of alternative finance. It should include explanations of suitable alternative financing schemes for basic research, applied research and innovation. More importantly, it should promote best practices from different countries and a selection of platforms for proven cases.

The EC could train universities on how to use the potential of alternative finance to increase the reach of a grant, on the internal distribution of funds (use one grant to support 20 partially crowdfunded projects, rather than just one science project), and on how to engage alumni networks as investors.

Pilot projects for research and science-oriented institutions

Stakeholders suggested that the EU should support the uptake of AF by universities and research centres by showing real-life examples, e.g. start with a piloting phase of 2-4 universities/country and use them as advocates of change/best practice-examples for the future.

EU support for campaign preparation - microgrants

The importance of micro-grants at national or European levels to support campaign preparation was stressed by eco-system players during the dedicated FG. The grants from EUR 3,000 – 5,000 would address two of the major barriers for fundraisers: insufficient communication skills and lack of resources for the preparation of a campaign. These micro-grants, however, can be broader in scope, and include the costs of consulting services for the creation of a successful campaign (advisory services from an AF consultant, PR services, video and graphic communication, business plan development).

One stop shop for AF for R&I

The idea of EU one-stop shop in order to provide support services for AF for R&I was strongly supported by stakeholders. It should not only play an informative role, guiding fundraisers on AF for R&I, AF specific platforms and AF support services providers, but also should distribute the aforementioned grants and facilitate further funding for fundraisers. It should also facilitate the mentoring of fundraisers by other fundraisers, AF consultants and ecosystem players. At national level, the one stop shop for AF for R&I could be taken over by National Contact Points and national financial intermediaries for EU financing.

⁴⁶ Link: https://ec.europa.eu/growth/tools-databases/crowdfunding-guide_en

⁴⁷ Link; <https://ec.europa.eu/digital-single-market/en/startup-europe>

Increasing transparency of platform operations

As dealt with before in section 4.2.2, fundraisers would benefit from clarity on platform operations, on their success rates and on methodologies for credit scoring and the screening of investors. The aforementioned Code of Conduct should also ensure the clarity of information on the platform's fees structure and the services that are provided for fundraisers. Moreover, examples of best practices in that respect should be further promoted by the EU.

EU quality endorsement of platforms for increased trust

Similar to investors, fundraisers are missing information on which platforms are reliable and worth pledging on. Particularly researchers and universities would make good use of some guidance on which AF platforms are suitable for which science projects, and would benefit from the review of existing platforms. The topic is further explored in the supply dimension.

7.4 Ecosystem

7.4.1 THE ISSUE OF THE FINANCING PIPELINE AND BUILDING AN AF FOR R&I ECOSYSTEM

Although the total number of platforms is growing, the number of newly funded AF platforms is decreasing. This is due to the growing market maturity, where it is harder for new platforms to attract new investors and projects and to build successful links with the ecosystem. There is also growing concentration and institutionalisation of the AF platforms - banks, VCs and business angels are setting up their own AF platforms or forming partnerships with existing ones. However, the policy options should leverage the need of facilitating links between platforms and financial ecosystem with the need of risk mitigation, as referring by banks riskier projects to AF platforms could lead to a concentration of high risk transactions on platforms the latter.

Although AF is perceived as a supplementary source of funding to other sources of financing, it has a leverage effect, attracting further investments from other sources of financing. Overall, the AF and AF for R&I, is still not clearly incorporated into the financing pipeline. Although platforms continue to build connections with accelerators, incubators, banks, VCs and business angels, there is a lack of established links where all ecosystem players cooperate together to maximise the effectiveness of the use of alternative finance.

7.4.2 DISCUSSION ON POLICY OPTIONS

European information and advisory hub for AF

The eco-system players agreed that the EU should support the creation (guidelines, recommendations) of local and regional ecosystems at national level, e.g. through chambers of commerce, start-up centres, etc. The role of providing coordinated information, training and advisory services can be fulfilled by the European information and advisory hub.

There is potential for EU action in the area of strengthening local and regional ecosystems at national level. This could be achieved through enforcing the creation of local/regional AF hubs which could provide advice on AF models and regulations.

Moreover, the EC could facilitate awareness building at national level by using existing EU information points and intermediaries, e.g. educating National Contact Points⁴⁸ to spread knowledge further.

Another option suggested by stakeholders is the development of standard agreements between public funding instruments (e.g. SME instruments) and AF platforms, in order to create simplified pre-selection processes for companies funded by EU or national grants.

Similar standard agreements could be developed for cooperation between research institutions and platforms, or between platforms and banks.

⁴⁸ Link: <https://erc.europa.eu/national-contact-points>

7.5 Final policy recommendations

The analysis of different dimensions helps to understand the problem and design policy options, but ultimately there needs to be an integrated, systemic architecture of options that brings together the different perspectives. Policy actions have implications for several stakeholders, as in the case of “measures to increase transparency of platform operations”, many of the policy measures are inter-related. For example, the EU proof of excellence is connected to the possible selection of projects for co-funding. The table below brings together all of the policy measures indicated as a being a priority by stakeholders.

Furthermore, whilst most of the policy measures are equally relevant for research and innovation, AF for research would benefit more from additional tailor-made support due to the extensive barriers and underdevelopment of the AF market in that respect.

Table 8 Prioritised EU policy measures in support of AF for R&I

Dimension	Recommendation	Details	Focus
SUPPLY (Investors)	Financial education	Greater EU level provision of awareness and educational campaigns; Coordination and exchange of good practices between MS and between platforms. Existing financial education strategies should include AF.	Overall for R&I
	Guarantees	Guarantee mechanisms for lending, managed by the platform, promoting higher risk-taking investment while minimising drawbacks.	Innovation specific
	EU match funding	The potential for cross-matching with AF is seen positively, in terms of additional funding attributed by EC funds to projects that have succeeded in leveraging funds from the crowd.	Innovation specific
	Code of conduct and standardised reporting	EU-level guidelines on standardised reporting on the methods and criteria used by the platform to assess projects.	Overall for R&I
	Tax exemptions for AF	Exemptions for the investments in AF can stimulate development of the AF market and AF for R&I.	Overall for R&I
	EU quality signalling for R&I specialised platforms	Platform pooling - the choice of AF platforms by the EU for the distribution of EU funds to projects would signal the quality of the platforms and projects. The choice of platforms should be based on the established pre-quality criteria.	Overall for R&I
PLATFORMS	Providing conditions for cross-border operations of R&I platforms	EU-wide AF Directive or EU wide clarification on the role of the AF platform; Simplification and clarification of different national regulations with regard to AF. European guidelines for platforms on cross-border operations and the endorsement of platforms.	Overall for R&I
	EU support for science platforms for a sustainable business model	EU support for the creation of scientific boards - pre-selection of projects by the EC funding mechanisms.	Research specific
DEMAND (Fundraisers)	One stop shop for AF for R&I	Providing support services for AF for R&I at EU level, guiding fundraisers on AF for R&I and AF specific platforms, facilitating further funding for fundraisers, providing mentoring. List of AF specific experts to be used by fundraisers	Overall for R&I

	Support for campaign preparation – microgrants	Micro-grants of up to EUR 5,000 at national or European level to support campaign preparation or consulting services for the creation of a successful campaign.	Overall for R&I
	Education of research institutions on AF for R&I	Alternative Finance Service Package for Research Institutions on how to use the potential of alternative finance. Pilot projects for research and science-oriented institutions.	Research specific
	Quality endorsement of science platforms	Providing information on which platforms are reliable and worth pledging on to increase the trust in platforms, and therefore increase the participation of researchers.	Research specific
ECOSYSTEM	EU information and advisory hub (one-stop shop)	Strengthening ecosystem links and cooperation, providing information services for fundraisers, investors and platforms, organising trainings and events on crowdfunding / alternative finance for R&I.	Overall for R&I

With an estimated amount of over EUR 755 million, AF for research and innovation has a substantial contribution to financing R&I. Thus, it can be argued that AF has developed dynamically in the absence of any EU action so far, and that platforms have found the ways to overcome challenges: for instance, platforms found their way around the issue of cross-border barriers by setting up a subsidiaries or merging with other platforms. Similarly, AF platforms have also found the way to enhance their transparency by promoting a self-regulatory code of conduct. Nevertheless, Europe’s total investment in AF is much smaller than in the US or Asia, and the gap is growing as Europe’s growth is slowing down. No action from the EU to favour the development of AF for R&I and to mitigate its risks, is likely to lead to an increase of the existing gap in R&I financing.

Moreover, AF is converging with other Fintech trends. Alternative finance is here to stay, but failing to provide support measures for AF for R&I can significantly hamper its development. More specifically, if the conditions are not created for a bigger uptake of AF for R&I by investors and fundraisers, R&I-oriented platforms will face the issue of their sustainability. In return, Europe will fail to create platforms big enough to be able to thrive and compete with US counterparts.

7.5.1 RECOMMENDATIONS IN SUPPORT OF OVERALL AF

Platform-related issues that are relevant for overall alternative finance in Europe, if not addressed, will affect also AF for R&I. In that respect, the EU institutions should focus on facilitating the clarity of cross-border operations and the transparency of platform operations.

EU should facilitate the clarity of cross-border operations for AF platforms

Without EU action, national fragmentation will continue as each country is currently developing its own AF frameworks, some more progressive, some more restrictive. An EU regulation on equity-based AF could harmonise the rules regarding the requirement to issue a prospectus, requirements to obtain a license from national authorities, and could define the limits for how much a company may raise from the general public per year and how much an individual investor may invest per year. However, it is also possible that such issues could be sufficiently addressed by amendments to existing directives. The issue needs to be further explored.

Whereas the EU level directive was a recurring issue during the course of the study, there is a potential for soft EU actions in the form of guidelines / recommendations on AF legislation for all Member States. Many countries do not have enough experience, or have had bad experiences. The EU should come up with minimum standards to be included (e.g. pragmatic investor protection) and aspects to be avoided (such as prospectus requirement for smaller projects).

Moreover, there is a need for European alternative finance guidelines on cross border investments for platforms, and platforms for R&I, to enhance the understanding of the different regulatory and legislative regimes in Europe.

EU should promote the standard for transparency of AF operations

The lack of transparency of platform operations is the second biggest impediment to the uptake of AF by investors and fundraisers. In this respect, stakeholders strongly agree that EU should promote and facilitate creation of a Code of Conduct for AF platforms. The EU facilitated system of self-regulation could strengthen trust between the stakeholders of the ecosystem. Such a system will provide transparency on the crowdfunding process and promote set of good business practices. The Code of Conduct should also standardise the way in which the results of AF campaigns are reported (key performance indicators) as well as minimum standard criteria for the selection of projects by AF platforms.

This could be supported by the creation of an EU level hub with a strong alliance between industry, universities, entrepreneurs and governments.

EU level AF information and advisory hub

The need for common guidelines, recommendations and training for all groups of stakeholders: investors, platforms, fundraisers and national regulators has been an overarching issue. The role of providing coordinated information, training and advisory services could be fulfilled by the European information and advisory hub, a one-stop shop for AF, and AF for R&I. Such an EU facilitated hub could:

- Provide training and guidance on alternative finance to the existing innovation hubs, regulators, investors, fundraisers and platforms,
- Provide information services on specific AF models for fundraisers and investors and their suitability for specific projects and sectors,
- Organise trainings and events on crowdfunding / alternative finance,
- Provide consulting services for fundraisers, connecting stakeholders: marketing consultants, platforms and fundraisers,
- Provide a list of AF-specialised experts / service providers: consultants, experts
- Share best practice examples with regard to AF, and AF sectors or issues e.g. AF for R&I, best practices of EU funded IPR & Patents,
- Promote standard contract agreements between platforms and fundraisers,
- Support fundraisers in obtaining and using existing grants and facilitate the search for further funding for fundraisers, including the distribution of micro-grants,
- Promote a Code of Conduct, standardised reporting for platforms and educate them on cross-border operations,
- Promote harmonisation of national AF regulations.

The European information and advisory hub could also play the role of the missing link – connecting different stakeholders at national and regional level, but also establishing AF's role in the financing pipeline for researchers and innovative companies and promoting cooperation within the ecosystem.

Germany: KITcrowd initiative

Karlsruhe Institute of Technology (KIT) combines three core tasks of conducting research, providing higher education, and promoting innovation. With about 9,300 employees and 25,000 students, KIT is one of the largest research and higher education institutions in Europe focussing on natural sciences and engineering.

The initiative KITcrowd: KITcrowd is a crowdfunding portal, that hosts selected crowdfunding and crowd investing projects from students or researchers at KIT, or interesting projects from its network. KITcrowd aggregates projects running on different crowdfunding platforms and thus allows providing an overview of open and closed KIT crowdfunding projects.

Furthermore, KITcrowd helps to leverage funds for selected internal KIT Projects via the so-called „KIT-Lever“. These projects receive, in addition to the funds collected via crowd, co-financing through the KIT-Innovation-Fund, a KIT-internal funding programme for technology

transfer projects in scientific institutes. The aim is the product-oriented development of market-relevant potential up to commercialisation together with an industry partner.⁴⁹

Financial education

Many national government and regulators have implemented financial education strategies, typically managed by the regulatory authority. However, AF is seldom included in these strategies, and mostly in countries that have implemented a bespoke regime (e.g. Finland). Some countries, such as Spain, have introduced a form of "risk labelling" for financial instruments that help non-professional investors be immediately aware of the risks.

In other words, whilst education on alternative finance could be seen as a soft intervention alternative to hard regulation, in reality, it is taking place mostly in countries that have implemented a regulatory provision. There is scope for a European intervention in this case, to develop MOOC-like courses on AF, to facilitate exchanges of good practices between countries but also between platforms on how to raise awareness and education on AF.

Spanish Financial Education Plan

The Plan de Educación Financiera is led by CNMV and the Banco de España. It was initially designed for the period 2008-2012 and it has been renewed for 2013-2017. The two major milestones of the Financial Education Plan 2008-2012 have led the introduction of financial education in schools. In addition, a website focused on financial education (www.finanzasparatodos.es) has been launched.

The Financial Education Plan 2013-2017 aims to continue an education on financial issues, taking into account new issues such as diversity and accessibility. The plan targets both students and adults through training, workshops and publications.

Tax exemptions at national level for investments in AF

The UK tax exemption scheme that included exemptions for investments into crowdfunding, stimulated the development of the UK AF market to a major extent. Thus, the tax deductibility of investments in AF at national level is considered to be the most effective way of increasing the general uptake by investors. On the one hand, particularly the donation-based platforms would appreciate tax deductibility from funding. On the other hand, taxes could incentivise investments in innovation projects from lending end equity platforms e.g. taxation in UK.

UK tax exemption schemes and how they support crowdfunding

Enterprise Investment Scheme (EIS) and Seed Enterprise Investment Scheme (SEIS) are two different tax benefits offered in the UK that are associated with crowdfunding. The EIS:

- Is for investors in smaller, higher-risk trading companies,
- Offers 30% income tax relief on a maximum investment up to GBP 1 million.

Additionally, the SEIS programme was created to provide tax relief to private investors who invest in early stage companies. The SEIS:

- Is for very early stage companies,
- Has an annual limit of GBP 150,000 raised, but this may be used in conjunction with EIS.

The company:

- May not have more than GBP 200,000 in assets when shares are issued,
- Must have fewer than 25 employees,
- Must not be listed,
- Cannot have existed for more than 2 years,
- Must not have received investment from a Venture Capital Trust.

The tax benefits are designed to incentivise investors to support early stage companies working on innovative projects, including an incentive to invest in equity crowdfunding. Indeed, many UK Equity Crowdfunding websites are promoting these tax incentives in order to attract more

⁴⁹ Link: <http://www.kit.edu/kit/english/index.php>

investors. For instance, Seedrs (UK) drives investors and entrepreneurs through the SEIS and EIS process. Moreover, all the equity crowdfunding sites in the country provide information on which tax incentive programmes are available.

Similarly, the tax exemptions for crowdfunding might also be focused on investments into research and innovation projects only. The tax exemptions could follow the example of Spanish solution, where taxpayers can deduct part of the investments in R&D and that include investments through crowdfunding, or the Italian solution, where a personal and corporate income tax reduction is applied to investors in innovative start-ups.

Spain - Tax exemptions for R&D

In Spain, tax exemptions are applied to investors that invest through crowdfunding platforms. Tax exemptions are also applied to the personal income tax (IRPF) as well as to the Corporate income Tax:

- 35% reduction relative to the amount of the invested capital, with a maximum of EUR 200 thousand per year, and a cumulative maximum amount of EUR 200 thousand invested in the same company over four years.
- 50% reduction on the dividends and collected interests starting from the fourth year, up to the eighth year of functioning of the new company.

Moreover, in case of losses, it will be possible to deduct them entirely, except for the reductions that were already applied.

In this case, assistance in raising the awareness of tax exemptions covering crowdfunding for R&I would be needed. There is a crucial role for the EC on the one hand to encourage and support the adoption of similar measures at national level, and on the other, to ensure that it does not evolve into additional barriers to cross-border investment.

Italy - Tax exemptions for investments in innovative start-ups

In Italy, a Personal and Corporate income tax reduction is applied to investors in innovative start-ups:

- Individuals (e.g. business angels) investing in innovative start-ups are awarded a personal income tax reduction (IRPEF) up to 19% of the invested amount, with a maximum investment up to EUR 500 thousand.
- Legal entities (e.g. VC funds) are awarded a corporate income tax (IRES) reduction of 20% of the invested amount, with a maximum investment up to EUR 1.8 million.

7.5.2 RECOMMENDATIONS IN SUPPORT OF AF FOR RESEARCH AND INNOVATION

Quality endorsement of R&I platforms

There is a need for the quality endorsement of R&I platforms by the EU. The EU action in this area should focus on creating an open repository of science-related platforms based on to the set of specific pre-set criteria, e.g. the platform should be active and have active projects, it should commit to Code of Conduct and standardised reporting procedures. The platform pooling for AF for R&I by the EC, could also take a form similar to the French crowdfunding marketplace: TousNosProjet, displaying all science-related platforms in one online space. The R&I-related platforms could be displayed on the European AF marketplace – redirecting investors and fundraisers to a platform of their choice.

Such an online space can be created within the EU AF information and advisory hub or as a separate online marketplace. In case of the latter, such a marketplace could take over the role of one-stop shop for R&I.

Support for AF campaign preparation – micro- grants

The most efficient and quick solution to the limitations in the communication skills of fundraisers are European micro-grants to finance preparatory costs of an AF campaign. The sort of costs

covered could include the consulting services for the creation of a successful campaign (advisory of AF consultant, PR services, video and graphic communication, business plan development).

The EU could either: 1) choose a provider that would give out grants or 2) create the intermediary for grants. As has been previously discussed, the EU AF hub could take over this role.

Moreover, there is a possibility of using the Horizon 2020 SME Instrument (phase 1)⁵⁰ for financing the preparatory costs of the AF campaign.

7.5.3 RECOMMENDATIONS IN SUPPORT OF AF FOR INNOVATION

EU Guarantee

Guarantee mechanisms for lending, managed by the platform, are considered a good way for promoting higher risk-taking investments while minimising drawbacks. However, as signalled by the Spanish science platform, the guarantees are aimed at existing investors. Thus, they increase the amount of money invested, rather than the number of investors alone. The guarantee at European level could follow the example of the Danish Market Development Fund.

Danish Market Development Fund guarantee

The Danish Market Development Fund offers a guarantee of the product to ensure the innovative character of the product and, therefore, mitigate the uncertainty of the buyer about investing in new technology. In this case, the risk is split between the manufacturer (20%), the Market Development Fund (60%) and the buyer (20%), i.e. if the product deviates substantially from the initial promise, the customer will get back up to 80% of the price. With a successful application of the programme, a total guarantee framework of DKK 3 – 12 million can be granted for the guarantee of new and innovative products.⁵¹

In order to help small companies to obtain loans from banks, the European Commission created financial instruments that are aimed at helping to compensate for a lack of collateral/creditworthiness by reducing the risks that the banks face. There is a potential to incorporate a crowdfunding element into the InnovFin SME guarantee scheme⁵², where approved financial intermediaries provide securitised loans via chosen crowdfunding platforms in a format similar to those recently launched by the European Investment Fund (EIF) pilot with Funding Circle (Alois, 2016 (b)). The intermediaries could also be instructed to redirect SMEs to crowdfunding platforms if the latter were refused loans by financial intermediaries. In other words, intermediaries could be requested to perform an additional information hub role.

UK - Funding Circle, European guarantees and securitised loans

Funding Circle is the world's leading peer-to-peer lending platform marketplace exclusively focused on small and medium sized businesses. Funding Circle has facilitated more than GBP 2 billion of loans to 16,000 businesses in the UK so far. The AF platform cooperates with national governments and international bodies in the provision of innovative AF solutions.

In 2016, the European Investment Bank agreed to provide GBP 100 million investment in loans to UK small businesses through Funding Circle, alongside GBP 25 million from the Funding Circle SME Income Fund (EIB, 2016).

Moreover, the European Investment Fund, part of the European Investment Bank Group, and KfW Group (DE), leading commercial bank, provided the securitisation of Funding Circle loans, in support of small businesses in UK the same year. The transaction "...represents an alternative and complementary financial instrument that can be used to increase lending to small businesses in the real economy and reduces their dependency on bank lending" (EIF, 2016).

⁵⁰ Link : <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/sme-instrument>

⁵¹ Link : <http://www.techfunding.eu/market-development-fund-markedsmodningsfonden>

⁵² Link : <http://www.eib.org/products/blending/innovfin/products/index.htm>

EU matching funds / co-investment

The potential for cross-matching AF with EU is seen positively suggesting that the EC could use the market expertise of crowdfunding platforms and wisdom of the "crowd" as a risk minimisation tool for investing in R&I.

EC could use the matching fund mechanism on AF platforms – platforms specialised in the field would pre-select projects which, after reaching a specific level of funding from the crowd / professional investors, would receive the remaining part from EU funds.

City of Milan and London and matching fund initiatives

In Italy the mayor of Milan launched collaboration with reward crowdfunding platform Eppela (IT) in order to distribute EUR 400,000 to support innovative business projects with high social impact. Projects that received initial level of funding from crowdfunding platform (50%) would receive further funding from the City of Milan.⁵³

Similarly, mayor of the City of London launched a 'Major's Civic Crowdfunding Programme' with Spicethive (UK) AF platform pledging up to GBP 20,000 of additional support towards campaign's target of innovative projects that contribute to community spaces.⁵⁴

In practice, that would mean that the EU would commit to contributing a certain percentage of the pledged amount (platforms mention 30% of a total sum pledged) or a certain sum from the start, up to a specific agreed level. Only after reaching specific level, the EC would contribute. By doing this, a two-direction signalling effect would come into effect. Investors would benefit from the EC quality signalling, in return, the EC would benefit from market validation of the idea.

In terms of EU instruments, European Angels Fund (EAF)⁵⁵, InnovFin Business Angels ICT pilot⁵⁶ and the SME Instrument were mentioned as possible instruments.

Crowdcube and the Mayor of London co-investment fund

The Mayor of London has launched the London Co-Investment Fund (LCIF) with the aim of providing low cost finance to small and medium sized businesses.

Target:

- Small businesses with expertise in the science, technology and digital arenas,
- Based in London,
- Who are looking for co-investment in seed rounds between GBP 250,000 and GBP 1 million,
- Able to demonstrate that they have the potential to create new jobs.

The London Co-Investment Fund is supported by:

- GBP 25 million from the Mayor of London
- GBP 60 million from six private partners. Amongst others there is Crowdcube, which is the first and the largest CF platform in the UK.

The LCIF invests exclusively in funding rounds led by competitively selected co-investment partners and all investment related decisions are made by the partners. For every GBP 1 that the fund invests, the partners are obligated to directly invest GBP 2.9 or secure the same from their investors. By doing this, start-ups are provided with additional resources that will boost their growth.

Whereas, the easiest solution is still a tendering process where the platform receives funds through a tender and distributes them further. The question still remains whether chosen AF platforms can become financial intermediaries for R&I in the case of equity crowdfunding for R&I.

⁵³ Link : <http://www.milanosmartcity.org/joomla/7-notizie/45-crowdfundig-civico-al-via-la-sperimentazione-con-un-stanziamiento-di-oltre-400-mila-euro>

⁵⁴ Link : <https://www.spacehive.com/Initiatives/mayoroflondon?Tid=hive-88-24ef8a33>

⁵⁵ Link: http://www.eif.org/what_we_do/equity/eaf/

⁵⁶ Link: <https://ec.europa.eu/digital-single-market/en/news/launch-innovfin-business-angels-ict-pilot>

7.5.4 RECOMMENDATIONS IN SUPPORT OF AF FOR RESEARCH

EU support to science platforms for sustainable business model

The need for EU support for the creation of scientific-boards was stressed by platforms specialised in science-related projects as they are struggling to reach profitable business models.

Platforms could take the advantage of EC research / scientific expertise (database of experts) to assess projects and this way solve the problem of the challenges of setting up a scientific board. In return, the EU could use a pre-selection process using the "crowd" for the validation of projects. Currently, EC grants are based on expert decisions. However, stakeholders suggested that more innovations come out of research projects if a community already rates the project idea as relevant at the beginning, e.g. the EC could suggest ten pre-evaluated projects and the "crowd" would decide which one will be funded. The EC could explicitly demand the involvement of AF in certain calls in order to support the business models of platforms.

Education of research institutions on AF for R&I

In order to overcome the lack of awareness on AF amongst researchers and the relatively small participation of universities and researchers in AF, the EU education of institutions on AF should go beyond merely providing information.

The EU should provide a comprehensive Alternative Finance Service Package for Research Institutions on how to use the potential of alternative finance. It should include an explanation of suitable alternative financing models for basic research, applied research and innovation; include info on existing R&I platforms, as well as training materials for the successful preparation of AF campaigns. The EC could train universities on how to use the potential of alternative finance to increase the reach of a grant, on the internal distribution of funds (use one grant to support 20 partially crowdfunded projects, rather than just one science project), and on how to engage alumni networks as investors.

The EU should also facilitate cooperation between national research institutions and AF platforms, starting by training National Contact Points to become further advocates of change.

However, more importantly, it should promote best practices from the countries and a selection of proven cases from the platforms. The EU institutions should support the uptake of AF by universities and research centres by showing real-life examples, e.g. start with a pilot phase with a couple of research institutions and later use these institutions for further AF for R&I promotion.

8. CONCLUDING REMARKS

The study has shown that AF plays an important role in funding R&I. In quantitative terms, it provides a sizeable contribution to funding R&I, although not living up to the hype embodied by the headlines about “AF overtaking Venture Capital”. It can’t be considered as a solution to the current R&I funding gap in Europe, also because its growth in Europe appears to be lagging behind other regions of the world.

Yet, AF plays an even more important role from a qualitative point of view. There is no such thing as “AF for R&I”: different instruments can provide a different contribution to different phases of the innovation cycle. Hence, there is no space for a “one size fits all” policy intervention. The role of AF extends far beyond the pure provision of funding, especially in the domain of R&I. It helps researchers raise awareness about science and create support networks that add value to the research. It helps entrepreneurs test the project potential at an early stage and market their innovations. It helps investors diversify their risks and enter new markets. Moreover, platforms themselves are not pure neutral matchmaking players: they assess and filter projects, provide financial education, and help bring the ecosystem together. Even looking at policies only, the introduction of bespoke regimes has not just been substantial to incentivise investment, but also to generate wider awareness and trust in AF.

Looking ahead, one challenging area appears to be related to understanding the wider role of AF in terms of signal creation, usage, and propagation within the financial ecosystem. This is particularly true in a context such as R&I, characterised by high information asymmetry as the main barrier to investment.

How do different signals interact, and how can they be optimised? Platforms can use third party funding decisions to select projects; professional investors can use AF to orient their investment decisions; non-professional investors can follow professional investors; other funding instruments (public and private) can use AF to orient their funding decisions (or even outsourcing this function by providing match-funding). The opportunities, but also the risks, generated by the interaction between signals are not yet fully understood, especially when considering the emergence of automatic, data-driven investment decisions.

The general policy lesson to be learnt is that in the future, innovation policy will have to include the information layer: how data is managed and shared by the different players. Here, governments will play a double role.

As a funder, they can ensure the provision of high-quality signals to the market by implementing high-quality evaluation processes, and ensuring the underlying evidence is shared as public as possible. High quality investment decisions by governments could become high quality signals for the market and could help reducing information asymmetries – but only if they are trusted. Current evidence shows that as of today, stakeholders do not consider government assessment (for instance when looking at H2020 project evaluation reports) as an effective signal to attract investment.

As policy-makers, they can remove bottlenecks to data flows between all actors in the AF ecosystem in order to increase confidence, reduce information asymmetry and encourage investment towards high risk, disruptive innovation, whilst at the same time they should recognise that information asymmetries and proprietary data are not a pathological but a physiological aspect of financial markets.

Whilst there is no strong evidence of market failure justifying hard policy intervention, it is clear that there is lots of room for beneficial soft policy intervention. But to be effective, this intervention will require careful design and extensive collaboration with stakeholders: AF will require smart, data driven and collaborative policies.

BIBLIOGRAPHY

- Aerospace Defence Security Space, SUPPORTING SMES & MID-CAPS - Helping SMEs & Mid-caps invest in growth., pp.1–14.
- AFME, 2015. Bridging the growth gap. Afme.
- Agrawal, A., Catalini, C. & Goldfarb, A., 2011. The Geography of Crowdfunding. SSRN Electronic Journal, pp.1–57.
- Agrawal, A., Catalini, C. & Goldfarb, A., 2013. Some simple economics of crowdfunding. NBER Working Paper No. 19133, pp.1–47.
- AK WIEN, 2014. An analysis of 18 platforms in Germany, Switzerland, pp.1–10.
- Allen & Overy, 2015. Funding European business: Harnessing alternatives.
- Amann, S. & Lange, B., 2013. Thematic Programme Capitalisation: Analysis report on Innovation Capacity of SMEs.
- Angel.me, 2015. The battle for entrepreneurial growth.
- Antonenko P.D., Lee B.R., K.A.J., 2014. To Crowdfund Research, Scientists Must Build an Audience for Their Work. PeerJ, (May), pp.1–17.
- Bachmann, A., 2015. Online Peer-to-Peer Lending-A Literature Journal of Internet Banking and Commerce.
- Bain & Company, RESTORING FINANCING AND GROWTH TO EUROPE' S SMEs: Four sets of impediments and how to overcome them,
- Banhatti, R.D., 2016. Crowdfunding of a Social Enterprise: The GloW Project as a Case Study, pp.1–251.
- BBVA Research, 2013. Economic Outlook - United States,
- BBVA Research, 2015. Crowdfunding in 360°: alternative financing for the digital era. , pp.1–26.
- Beaulieu, T.Y., Sarker, S. & Sarker, S., 2015. A conceptual framework for understanding crowdfunding. Communications of the Association for Information Systems, 37, pp.1–31.
- Belleflamme, P., Lambert, T. & Schwienbacher, A., 2013. Individual crowdfunding practices. Venture Capital, 15(4), pp.313–333.
- Belleflamme, P., Lambert, T. & Schwienbacher, A., 2014. Crowdfunding: Tapping the right crowd. Journal of Business Venturing, 29(5), pp.585–609.
- Belleflamme, P., Omrani, N. & Peitz, M., 2015. The economics of crowdfunding platforms. Information Economics and Policy, 33, pp.11–28.
- Berger, S.C. & Gleisner, F., 2009. Emergence of Financial Intermediaries in Electronic Markets: The Case of Online P2P Lending. BuR - Business Research, 2(1), pp.39–65.
- Bethlendi, A. & Végh, R., Crowdfunding – could it become a viable option for Hungarian small businesses?, pp.100–124.
- BIOCOM AG, 2015. Analysis of Crowd- based Financing in European Life Sciences.
- Branker, K. & Pearce, J.M., Accelerating the Growth of Solar Photovoltaic Deployment with Peer to Peer Financing.
- Brenan, J., 2014. Science by the Masses: Is crowdfunding the future for biotech start-ups? IEEE Pulse, 5(1), pp.59–62.
- Bretschneider, U., Knaub, K. & Wieck, E., 2014. Motivations for crowdfunding: What drives the crowd to invest in start-ups? In ECIS 2014 Proceedings - 22nd European Conference on Information Systems. Association for Information Systems.
- British Business Bank, 2014. Equity Crowdfunding in the UK: Evidence from the Equity Tracker.
- Brüntje Dennis, G.O., 2016. Crowdfunding in Europe - State of the Art in Theory and Practice.
- Bruton, G. et al., 2015. New Financial Alternatives in Seeding Entrepreneurship: Microfinance, Crowdfunding, and Peer-to-Peer Innovations. Entrepreneurship: Theory and Practice, pp.9–26.
- Burtch, G., Ghose, A. & Wattal, S., 2014a. An experiment in crowdfunding: Assessing the role and impact of transaction-level information controls. In 35th International Conference on Information Systems "Building a Better World Through Information Systems", ICIS 2014. Association for Information Systems.

- Burtch, G., Ghose, A. & Wattal, S., 2014b. The Hidden Cost of Accommodating Crowdfunder Privacy Preferences: A Randomized Field Experiment. *Management Science*, 61(5), pp.949–962.
- Business France, 2015. Startup funding: A national priority.
- Calders, T., & Verwer, S., 2010. Three naive Bayes approaches for discrimination-free classification. *Data Mining and Knowledge Discovery*, 21(2), 277-292.
- Cambridge Centre for Alternative Finance & University of Cambridge, 2015. Opportunities Within the Diversity of European Crowdfunding.
- Cambridge-KPMG 2016, The 2nd European Alternative Finance Industry Report, Sustaining Momentum, Cambridge Centre for Alternative Finance & University of Cambridge.
- Canada Media Fund, 2012. Crowdfunding in a Canadian Context -Exploring the Potential of Crowdfunding in the Creative Content Industries.
- Carlton Mansfield, 2015. Research on Crowdfunding in China 2015.
- Chen, D., Lai, F. & Lin, Z., 2014. A trust model for online peer-to-peer lending: a lender's perspective. *Information Technology and Management*, 15(4), pp.239–254.
- Chuene, D. & Mtsweni, J., 2015. The adoption of crowdsourcing platforms in South Africa. 2015 IST-Africa Conference, IST-Africa 2015, pp.1–9.
- Colombo, M.G., Franzoni, C. & Rossi-Lamastra, C., 2015a. Internal social capital and the attraction of early contributions in crowdfunding. *Entrepreneurship: Theory and Practice*, pp.75–100.
- Colombo, M.G., Franzoni, C. & Rossi-Lamastra, C., 2015b. Cash from the crowd. *Science (New York, NY)*, 348(6240), p.1201.
- Cordova, A., Dolci, J. & Gianfrate, G., 2015. The Determinants of Crowdfunding Success: Evidence from Technology Projects. *Procedia - Social and Behavioral Sciences*, 181, pp.115–124.
- CrowdfundingHub, 2016. Crowdfunding Crossing Borders. An Overview of Liability Risks Associated with Cross Border Crowdfunding Investments
- CrowdfundingHub, 2016a. The Current State of Crowdfunding in Europe.
- Crowdsourcing.org, 2012. Crowdfunding industry report - market trends, composition and
- Crowdsurfer-EY, 2015, Crowdfunding: Mapping EU markets and events study, European Commission
- crowdfunding platforms. Research report. pp.1–30.
- Crucial Crowdfunding Capital, 2016. CROWDFUNDING FOR ENTERPRISE (an examination of the crowdfunding landscape in Europe).
- CSES, 2015. Assessing the Potential for EU Investment in Venture Capital and Other Risk Capital Fund of Funds.
- Cullina, E., Morgan, D.L. & Conboy, D.K., 2014. The Development of a Public / Private Model for the Crowd- funding and Crowdsourcing of Scientific Research Projects Motivation for Research.
- Cumming, D.J., Leboeuf, G. and Schwiendbacher, A., 2014. Crowdfunding Models: Keep-it-All vs. All-or-Nothing. Paris December 2014 Finance Meeting EUROFIDAI-AFFI Paper.
- Danmayr, F., Archetypes of Crowdfunding Platforms: A Multidimensional Comparison.
- Desai, R.M. & Kharas, H., 2013. The wisdom of crowd-funders what motivates cross-border private development aid?
- Dietrich, A. & Amrein, S., 2015. Crowdfunding Monitoring Switzerland 2015., pp.1–24.
- Dragojlovic, N. & Lynd, L.D., 2014. Crowdfunding drug development: The state of play in oncology and rare diseases. *Drug Discovery Today*, 19(11), pp.1775–1780.
- Duda, R. O., & Hart, P. E., 1973. Pattern classification and scene analysis (Vol. 3). New York: Wiley.
- Dufour, Y. & Steane, P., 2006. Competitive paradigms on strategic change: mapping the field and further research development. *Strategic Change*, 15(3), p.129.
- Dushnitsky, G., Guerini, M., Piva, E., & Rossi-Lamastra, C., 2016. Crowdfunding in Europe. *California Management Review*, 58(2), 44-71.
- EBAN, 2014. Statistics Compendium, The European Trade Association for Business Angels, Seed Funds, and Other Early Stage Market Players.
- E. K. Byrnes, J. et al., 2014. To crowdfund research, scientists must build an audience for their work.

Elkuch, A., Brunner, C. & Marxt, C., 2013. Reciprocal crowdfunding as means to enable student and graduate entrepreneurship in Africa - a case study of Rwanda. *International Journal of Entrepreneurship and Small Business*, 19(4), p.498.

Emekter, R. et al., 2015. Evaluating credit risk and loan performance in online Peer-to-Peer (P2P) lending. *Applied Economics*, 47(1), pp.54–70.

ESMA European Securities and Markets, 2014. Opinion Investment-based crowdfunding,

European Commission, 2013. Dynamic financial constraints and innovation: Evidence from the UK Innovation Surveys.

Eurofi, 2014. Providing appropriate financing tools for EU SMEs and midcaps., pp.2012–2014.

EuroFinuse Position, 2013. EuroFinUse Response to the European Commission Consultation "Crowdfunding in the EU – Exploring the added value of potential EU action."

European Banking Authority, 2013. EBA response to the European Commission's Consultation Paper on Crowdfunding.

European Banking Authority, 2015. Opinion of the European Banking Authority on lending-based crowdfunding., 1(1093), pp.1–40.

European Commission, 2000. DIRECTIVE 2004/39/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 April 2004 on markets in financial instruments amending Council Directives 85/611/EEC and 93/6/EEC and Directive 2000/12/EC of the European Parliament and of the Council and repealing

European Commission, 2001. Consultation document - Crowdfunding in the EU - Exploring the added value of potential EU action.

European Commission, 2010. Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2010) 546 final.

European Commission, 2010a. Turning Europe into a true Innovation Union, MEMO/10/473 06/10/2010, http://europa.eu/rapid/press-release_MEMO-10-473_en.htm?locale=en

European Commission, 2011. Action plan to improve access to finance for SMEs, COM(2011) 870 final.

European Commission, 2012. A framework for European Crowdfunding.

European Commission, 2013a. ENTREPRENEURSHIP 2020 ACTION PLAN Reigniting the entrepreneurial spirit in Europe, COM(2012) 795 final.

European Commission, 2013b. Financial instrument facilities supporting access to risk finance for research and innovation in Horizon 2020.

European Commission, 2013c. Innovation Union A pocket guide on a Europe 2020 initiative.

European Commission, 2014a. COM(2014) 172 final, Unleashing the potential of Crowdfunding in the European Union, COM(2014) 172 final.

European Commission, 2014b. GREEN PAPER LONG-TERM FINANCING OF THE EUROPEAN ECONOMY {COM(2013) 150 final}.

European Commission, 2014c. Crowdfunding and the Role of Managers in Ensuring the Sustainability of Crowdfunding Platforms.

European Commission, 2014d. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU, EURATOM) No 966/2012 on the financial rules applicable to the general budget of the Union EN.

European Commission, 2014e. Crowdfunding innovative ventures in Europe - The financial ecosystem and regulatory landscape.

European Commission, 2014f. REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU, EURATOM) No 966/2012 on the financial rules applicable to the general budget of the Union, COM(2014) 358 final.

European Commission, 2015. Funding Research, Innovation and Culture in a New Digital Age: Opportunities and Challenges for European Crowdfunding Champions European, workshop held in Brussels on 9 July 2015.

European Commission, 2015a. Crowdfunding: Mapping EU markets and events study Executive Summary.

European Commission, 2015b. Crowdfunding in Europe - state of play and next steps.

European Commission, 2015c. Green Paper - Building a Capital Market Union.

European Commission, 2015d. GREEN PAPER Building a Capital Markets Union, COM(2015) 63 final.

European Commission, 2015e. HORIZON 2020 WORK PROGRAMME 2014 – 2015 6. Access to Risk Finance Revised.

European Commission, 2015f. INVESTMENT AND COMPANY REPORTING Economic analysis and evaluation Head of unit, p.22991111.

European Commission, 2015g. Understanding Crowdfunding and its Regulations How can Crowdfunding help ICT Innovation?

European Commission, 2015h. Access to finance: still a barrier for EU companies' growth, published on: 12/11/2014, last update: 19/06/2015; http://ec.europa.eu/enterprise/newsroom/AF/itemdetail.AFm?item_id=7893

European Commission, 2016. Commission staff working document - Report on Crowdfunding in the EU Capital Markets Union.

European Crowdfunding Network, 2013. Review of Crowdfunding Regulation - Interpretations of existing regulation concerning crowdfunding in Europe, North America and Israel

European Foundation Centre & Transnational Giving Europe, Netherlands, 38, pp.1–7.

European Investment Bank, 2013. Supporting access to finance for SMEs and midcaps.

Falch, M. & Henten, A., 2008. Investment dimensions in a universal service perspective: next generation networks, alternative funding mechanisms and public-private partnerships. *Info*, 10(5/6), pp.33–45.

Fang, Z., Zhang, J. & Zhiyuan, F., 2014. Study on P2P E-finance platform system: A case in China. Proceedings - 11th IEEE International Conference on E-Business Engineering, ICEBE 2014 - Including 10th Workshop on Service-Oriented Applications, Integration and Collaboration, SOAIC 2014 and 1st Workshop on E-Commerce Engineering, ECE 2014, pp.331–337.

Fatoki, O., 2014. The Financing Options for New Small and Medium Enterprises in South Africa. *Mediterranean Journal of Social Sciences*, 5(20), pp.748–755.

Feldmann, N. et al., 2014. Idea assessment via enterprise crowdfunding: An empirical analysis of decision-making styles. In *ECIS 2014 Proceedings - 22nd European Conference on Information Systems*. Association for Information Systems.

Fillippov S., Hofheinz P., 2016. From Startup to Scale-Up: Growing Europe's Digital Economy.

Financement Participatif France, 2014. Baromètre de l'année 2014 - Crowdfunding France.

Financial Conduct Authority, 2013. The FCA's regulatory approach to crowdfunding (and similar activities).

Financial Conduct Authority, 2015. A review of the regulatory regime for crowdfunding and the promotion of non-readily realisable securities by other media. Financial Conduct Authority.

For, O. & In, I., 2011. How can we improve access to risk finance in Europe? *Innovation*, pp.1–5.

Friedman, P.J., 2002. The impact of conflict of interest on trust in science. *Science and engineering ethics*, 8(3), pp.413–420.

Friedman, S & Jin, Z.G., 2014. The Information Value of Online Social Networks: Lessons from Peer-to-Peer Lending, NBER Working Paper No. 19820

Fumagalli, D.C. & Gouw, A.M., 2015. Crowdfunding for Personalized Medicine., 88, pp.413–414.

Funk, A.S., 2016. Institutions Influencing the Evolution of Crowdfunding in China: A Review of the World Bank Report on Crowdfunding's Potential for the Developing World. , pp.1–251.

G., G., 2016. Equity crowdfunding of an entrepreneurial activity., 32, pp.415–425.

Gajda, O. & Mason, N., 2013. Crowdfunding for impact in Europe and the USA.

Gerber, E.M. & Hui, J., 2013. Crowdfunding: Motivations and Deterrents for Participation. *ACM Transactions on Computer-Human Interaction*, 20(6), p.32.

Gierczak, M.M. et al., 2016. Crowdfunding: Outlining the New Era of Fundraising., pp.1–251.

Gierczak, M.M., Bretschneider, U. & Leimeister, J.M., 2014. Is all that Glitters Gold? Exploring The Effects of Perceived Risk on Backing Behavior in Reward-based Crowdfunding. *International Conference on Information Systems (ICIS)*, (2014), pp.1–13.

Giudici, G. et al., 2012. Crowdfunding: The New Frontier for Financing Entrepreneurship?, pp.1–13.

Gleasure, R., 2015. Resistance to crowdfunding among entrepreneurs: An impression management perspective. *Journal of Strategic Information Systems*, 24(4), pp.219–233.

Global Solution Network, 2015. CROWDFUNDING A Roadmap for Global Solution Networks.

- Goldfarb, A.A. & C.C. & A., 2015. Crowdfunding: Geography, Social Networks, and the Timing of Investment Decisions. , 24(2), pp.253–274.
- Gossel, B.M., Bruntje, D. & Will, A., 2016. Crowd and Society: Outlining a Research Programme on the Societal Relevance and the Potential of Crowdfunding. , pp.1–251.
- Grüner, H.P. & Siemroth, C., 2015. Cutting out the Middleman: Crowdinvesting, Efficiency, and Inequality, pp.3–5.
- Guerzoni, M. et al., 2016. The Emerging Crowdfunding Market in Italy: Are “the Crowd” Friends of Mine?, pp.1–251.
- Guo, Y. et al., 2016. Instance-based credit risk assessment for investment decisions in P2P lending. *European Journal of Operational Research*, 249(2), pp.417–426.
- Haas, P., Blohm, I. & Leimeister, J.M., 2014. An Empirical Taxonomy of Crowdfunding Intermediaries. *International Conference on Information Systems (ICIS)*, pp.1–18.
- Hagedorn, A. & Pinkwart, A., 2016. The Financing Process of Equity-Based Crowdfunding: An Empirical Analysis., pp.1–251.
- Hardy, W., 2013. How to perfectly discriminate in a crowd? A theoretical model of crowdfunding. *University of Warsaw Faculty of Economic Sciences Working Papers*, 16(101), pp.1–28.
- Hemer, J., 2011. A snapshot on crowdfunding. *Enconstor*, p.39.
- Hornuf, L. & Schwienbacher, A., 2015. Funding Dynamics in Crowdinvesting,
- Hornuf, Lars & Schwienbacher, A., 2014. The Emergence of Crowdinvesting in Europe.
- Huffman, W.E. & Just, R.E., 1999. Agricultural Research: Benefits and Beneficiaries of Alternative Funding Mechanisms. *Review of Agricultural Economics*, 21(1), pp.2–18.
- Ingram, C. & Teigland, R., 2013. Crowdfunding Among IT Entrepreneurs in Sweden: A Qualitative Study of the Funding Ecosystem and ICT Entrepreneurs’ Adoption of Crowdfunding,
- Ingram, C. & Teigland, R., Is crowdfunding doomed in sweden? When institutional logics and affordances collide, (Re-)design matters. , pp.1–12.
- Ingram, C., Teigland, R. & Vaast, E., 2014. Solving the puzzle of crowdfunding: Where technology affordances and institutional entrepreneurship collide. *Proceedings of the Annual Hawaii International Conference on System Sciences*, pp.4556–4567.
- Instruments, F., 2014. Horizon 2020 Kick off meeting - SMEs: the New tools / opportunities for access to finance introduced by Horizon 2020 (i.e. Horizon 2020 Financial Instruments).
- IPA Institute of Public Accounts, 2015. Crowd Funding, A policy response submission on crowd funding.
- Iyer, R., 2009. Screening in New Credit Markets: Can Individual Lenders Infer Borrower Creditworthiness in Peer-to-Peer Lending? *Harvard Kennedy School Faculty Research Working Papers Series*,
- Iyer, R. et al., 2014. Screening peers softly: inferring the quality of small borrowers. *National Bureau of Economic Research Working Paper Series*, (15242), pp.1–65.
- Janke Dittmer, J.A.M. and E.P.M.V., 2014. The Balance between Exploration and Exploitation in the “New” Venture Capital Cycle: Opportunities and Challenges. In *Exploration and Exploitation in Early Stage Ventures and SMEs*, pp.15–37.
- Jegelevičiūtė, S. & Valančienė, L., 2015. Comparative Analysis of the Ways Crowdfunding is Promoted. *Procedia - Social and Behavioral Sciences*, 213, pp.268–274.
- Johannsson, M. et al., 2015. Space and Open Innovation: Potential, limitations and conditions of success. *Acta Astronautica*, 115, pp.173–184.
- K., S., 2014. Wisdom of Crowds. *Inside Reference Data*, 9(4), pp.10–11.
- Kadra Branker, Emily Shackles, and J.M.P., 2013. Peer-to-peer financing mechanisms to accelerate renewable energy deployment. *Journal of Chemical Information and Modeling*, 53(9), pp.1689–1699.
- Kim, J. et al., 2015. An Empirical Analysis of a Crowdfunding Platform. , Working paper, p.27.
- Kirby, A.E. & Worner, S., 2014. Crowd-funding: An Infant Industry Growing Fast., pp.1–62.
- Kirilova, P.K., 2016. Impact of Debt Crowdfunding for Civic Projects on the Optimal Portfolio of a Socially Responsible Investor. , pp.1–251.
- Koeck, D.F. & A.J.B. & T.K. & B., 2014. Exploring entrepreneurial legitimacy in reward-based crowdfunding. *Venture Capital*, 16(3), pp.247–269.

- Kraus, D., 2007. Does borrowers' impatience disclose their hidden information about default risk?
- Kshetri, N., 2015. Success of Crowd-based Online Technology in Fundraising: An Institutional Perspective. *Journal of International Management*, 21(2), pp.100–116.
- Kuo, D.C.L. et al., 2014. Investigating the effects of project scales on the patterns and performance of successfully funded, technology-oriented innovative crowdfunding projects. *Industrial Engineering and Engineering Management (IEEM)*, 2014 IEEE International Conference on, 184(188), pp.9–12.
- Kuti, M. & Madarász, G., 2014. Crowdfunding. , pp.355–366.
- Langley, P., Iba, W., & Thompson, K. , 1992. An analysis of Bayesian classifiers. In *Aaai* (Vol. 90, pp. 223-228).
- Lam, P.T.I. & Law, A.O.K., 2016. Crowdfunding for renewable and sustainable energy projects: An exploratory case study approach. *Renewable and Sustainable Energy Reviews*, 60, pp.11–20.
- Larrimore, L. et al., 2011. Peer to Peer Lending: The Relationship Between Language Features, Trustworthiness, and Persuasion Success. *Journal of Applied Communication Research*, 39(1), pp.19–37.
- Lasrado, L.A. & Lugmayr, A., 2013. Crowdfunding in Finland – A New Alternative Disruptive Funding Instrument for Businesses. *AcademicMindTrek '13*, pp.194–201.
- Ledford, H., 2012. Alternative funding: Sponsor my science. *Nature*, 481, pp.254–5.
- Lee, C.H., Zhao, J.L. & Hassna, G., 2016. Government-incentivized crowdfunding for one-belt, one-road enterprises: design and research issues. *Financial Innovation*, 2(1), p.2.
- Lee, N., Sameen, H. & Cowling, M., 2014. Access to finance for innovative SMEs since the financial crisis. *Conference Paper - DRUID Society Conference 2014*, CBS, Copenhagen.
- Lehner, O.M., 2013. Crowdfunding social ventures: a model and research agenda. *Venture Capital*, 15(4), pp.289–311.
- Lehner, O.M., Grabmann, E. & Ennsgraber, C., 2015. Entrepreneurial implications of Crowdfunding as alternative funding source for innovations. *Venture Capital*, 1066, pp.1–19.
- Leonard, I.P.O.D., 2015. Crowdfunding for Hardware Things to consider before launching that Kickstarter campaign. , pp.22–23.
- Li, F.-W. & Pryer, K.M., 2014. Crowdfunding the Azolla fern genome project: a grassroots approach. *GigaScience*, 3(1), p.16.
- Li, Z. & Duan, J.A., 2014. Dynamic strategies for successful online crowdfunding. *24th Workshop on Information Technology and Systems*.
- Liao, C., Zhu, Y. & Liao, X., 2015. The role of internal and external social capital in crowdfunding: Evidence from China. *Revista de Cercetare si Interventie Sociala*, 49(JUNE), pp.187–204.
- Lin, M., Prabhala, N.R. & Viswanathan, S., 2009. Judging borrowers by the company they keep: social networks and adverse selection in online peer-to-peer lending.
- Loi, R. et al., 2015. Can microfinance crowdfunding reduce financial exclusion? Regulatory issues. *Journal of Managerial Psychology*, Vol. 30 No, pp.pp. 645–658.
- Lucia, P.M., 2015. Crowdfunding: among Suitability and Appropriateness Rules and its Applicability to Capital Increase Operations. , pp.287–332.
- Marelli, A. & Ordanini, A., 2016. What Makes Crowdfunding Projects Successful "Before" and "During" the Campaign?, pp.1–251.
- Marlett, D., 2015. Crowdfunding Art, Science and Technology A Quick Survey of the Burgeoning New Landscape. *Leonardo*, 48(1), pp.104–105.
- Marshall, J., 2013. Kickstart your research. *Proceedings of the National Academy of Sciences*, 110(13), pp.4857–4859.
- Mäschle, O., 2012. Rationing of excessive demand on crowdfunding-platforms.
- Mäschle, O., 2012. Which information should entrepreneurs on German crowdfunding-platforms disclose? *Thünen-Series of Applied Economic Theory*, (127), p.30.
- Massolution, 2015AF The Crowdfunding Industry Report.
- Mazzucato, M., 2013. Financing innovation: Creative destruction vs. destructive creation. *Industrial and Corporate Change*, 22(4), pp.851–867.
- Meyskens, M. & Bird, L., 2015. Crowdfunding and Value Creation. *Entrepreneurship Research Journal*, 5(2), pp.155–166.

- Milne, A. & Parboteeah, P., 2016. The Business Models and Economics of Peer-to-Peer Lending.
- Mina, A., Lahr, H. & Hughesy, A., 2013. The demand and supply of external finance for innovative firms. *Industrial and Corporate Change*, 22(4), pp.869–901.
- Mollick, E., 2014. The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing*, 29(1), pp.1–16. Available at: <http://dx.doi.org/10.1016/j.jbusvent.2013.06.005>.
- Mollick, E., & Nanda, R., 2015. Wisdom or madness? Comparing crowds with expert evaluation in funding the arts. *Management Science*.
- Moncada, J., 2015. Crowdfunding - Crowdfunding for social impact.
- Moritz, A. et al., 2014. Investor Communication in Crowdfunding: A Qualitative-Empirical Study. SSRN Working Paper No 2462282, pp.1–43.
- Moritz, A. & Block, J.H., 2016. Crowdfunding: A Literature Review and Research Directions., pp.1–251.
- Motylska-Kuzma, A., 2015. Cost of Crwodfunding as a Source of Capital for the Small Company. 18th International Academic Conference, pp.461–473.
- Muller, M. et al., 2013. Crowdfunding inside the enterprise. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI '13, p.503.
- MyMicroInvest, 2014. My MicroInvest - Invest alongside professionals in startups.
- Nabarro & altfiDATA, 2015. Where are they now? A report into the status of companies that have raised finance using Equity Crowdfunding in the UK.
- Naroditskiy, V. et al., 2014. Referral Incentives in Crowdfunding. IZA Discussion Paper Series, 7995(Hcomp), pp.1–18.
- Nasrabadi, A.G., 2016. Equity Crowdfunding: Beyond Financial Innovation. pp.1–251.
- Nesta, 2008. AN INTRODUCTION TO CROWDFUNDING.
- Nesta & University of Cambridge, 2014 (Cambridge-Nesta, 2014). Understanding Alternative Finance - The UK Alternative Finance Industry Report 2014.
- O'Toole, C.M., Lawless, M. & Lambert, D., 2015. Non-bank financing in Ireland: A comparative perspective. *Economic and Social Review*, 46(1), pp.133–161.
- Ossendorf, V. & Jekl, A., 2010. Regulation of Alternative Funds in the Czech Republic in the Context of the Debate on their Potential Regulation in the European, pp.120–129.
- Osimo, D., Pujol, L. & Porcu, F., 2015. Analysis of Alternative Funding Mechanisms for Scientific Research. In R. Vuorikari & Y. Punie, eds. *Analysis of Emerging Reputation and Funding Mechanisms in the Context of Open Science 2.0*. JRC IPTS.
- Otero, P., 2015. Crowdfunding. A new option for funding health projects. *Archivos argentinos de pediatría*, 113(2), pp.154–157.
- Ozdemir, V., Faris, J. & Srivastava, S., 2015. Crowdfunding 2.0: the next-generation philanthropy: A new approach for philanthropists and citizens to co-fund disruptive innovation in global health. *EMBO reports*, 16(3), pp.267–271.
- OECD, 2002. Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development, 6th edition, available at: <http://www.oecd.org/sti/inno/frascaticmanualproposedstandardpracticeforsurveysonresearchandexperimentaldevelopment6thedition.htm>
- OECD, 2005. Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition, available at: http://www.oecd-ilibrary.org/science-and-technology/oslo-manual_9789264013100-en
- Oxera, 2015. Crowdfunding from an investor perspective. Final report prepared for the European Commission Financial Services User Group, 17 July 2015.
- Parker, S.C., 2014. Crowdfunding, cascades and informed investors. *Economics Letters*, 125(3), pp.432–435.
- Partner, F. et al., 2015. Event Report. pp.1–5.
- Pazowski, P. & Czudec, W., 2014. Economic Prospects and Conditions of Crowdfunding. *Human Capital without Borders: Knowledge and Learning for Quality of Life*, pp.1079–1088.
- Pensco, 2015. 2015 PENSICO Crowdfunding Report.

- Pelizzon L., Riedel M., Tasca P., 2016. Classification of Crowdfunding in the Financial System, Banking Beyond Banks and Money. A Guide to Banking Services in the Twenty-First Century, Axel Springer.
- Perlstein, E.O., 2013. Anatomy of the Crowd4Discovery crowdfunding campaign. SpringerPlus, 2(1), pp.1–3.
- Pitschner, S. & Pitschner-Finn, S., 2014. Non-profit differentials in crowd-based financing: Evidence from 50,000 campaigns. Economics Letters, 123(3), pp.391–394.
- Posegga, O., Zylka, M.P. & Fischbach, K., 2015. Collective dynamics of crowdfunding networks. Proceedings of the Annual Hawaii International Conference on System Sciences, 2015-March, pp.3258–3267.
- Profatillov, D.A., Bykova, O.N. & Olkhovskaya, M.O., 2015. Crowdfunding: Online charity or a modern tool for innovative projects implementation? Asian Social Science, 11(3), pp.146–151.
- Pur, Sabine; Huesig, Stefan; Mann, Hans-Georg; Schmidhammer, C., 2014. How to analyze the disruptive potential of business model innovation in two-sided markets?: The case of peer to peer lending marketplaces in Germany. 2014 Portland International Center for Management of Engineering and Technology, PICMET 2014, pp.693–709.
- Rajput N.K., Singh V., B.A., 2015. Resources, challenges and way forward in rare mitochondrial diseases research. F1000Research, 4, p.70.
- Ramos, J., 2014. Crowdfunding and the Role of Managers in Ensuring the Sustainability of Crowdfunding Platforms.
- Ramos, J. & Gonza, B., 2016. Crowdfunding and Employment: An Analysis of the Employment Effects of Crowdfunding in Spain., pp.1–251.
- Rao, H. et al., 2014. Emerging dynamics in crowdfunding campaigns. Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 8393 LNCS, pp.333–340.
- Regner, P.C. & T., 2012. Crowdfunding: Determinants of success and funding dynamics.
- Ren, K., 2015. Peer-to-Peer Lending. pp.2–4.
- Riedl, J., 2013. Crowdfunding technology innovation. Computer, 46(3), pp.100–103.
- Risterucci, F., 2016. The Ten Commandments of Crowdfunding, pp.1–251.
- Robobank, 2015. Annual Report 2015.
- Roig Hernando, J. & Soriano Llobera, J., 2015. Crowdfunding de préstamos para PyMEs en España: Un análisis empírico. Estudios de economía aplicada, 33(1), pp.301–318.
- Roosevelt Institute, 2013. Will Crowdfunding Kickstart an Investment Revolution? Policy and Political Implications of Peer-to-Peer Financing. , pp.1–6.
- Rubinton, B.J., 2013. Crowdfunding: disintermediated investment banking, (47061).
- Rupeika-Apoga, R., 2014. Alternative Financing of SMEs in the Baltic States: Myth or Reality? Procedia - Social and Behavioral Sciences, 156(April), pp.513–517.
- Ryu, S. & Kim, Y.-G., 2016. A typology of crowdfunding sponsors: Birds of a feather flock together? Electronic Commerce Research and Applications, 16, pp.43–54.
- Safner, R., 2013. Essays on the Institutional Analysis of Copyright and Its Alternatives. Journal of Chemical Information and Modeling, 53(9), pp.1689–1699.
- Sahami, M., Dumais, S., Heckerman, D., & Horvitz, E., 2015. A Bayesian approach to filtering junk e-mail. In Learning for Text Categorization: Papers from the 1998 workshop (Vol. 62, pp. 98-105).
- Salomon, V., 2014. Emergent models of financial intermediation for innovative companies: from venture capital to crowdinvesting platforms in Switzerland.
- Sannajust, A., Roux, F. & Chaibi, A., 2014. Crowdfunding In France: A New Revolution?
- Santander, 2014. Corporate Social Responsibility Report.
- Schäfer S. M., Metag J., Feustle J. and Herzog L.; Selling science 2.0: What scientific projects receive crowdfunding online? Public Understanding of Science, 1–19, 2016.
- Scholz, N., 2015. The relevance of crowdfunding: The impact on the innovation process of small entrepreneurial firms. PhD Proposal, 1.
- Schwiebacher, A., 2010. Crowdfunding of Small Entrepreneurial Ventures.
- Schwiebacher, L.H. and A., 2014. Should Securities Regulation Promote Crowdinvesting?

- Sharma, A., Khan, J. & Devereaux, P.J., 2015. Is crowdfunding a viable source of clinical trial research funding? *The Lancet*, 386(9991), p.338.
- Sifferlin, B.Y.A., 2015. Paying to play. As U.S. spending on medical research lags, a new crowdfunding model emerges.
- Silanes L., McCahery F. J., Schoenmaker D., and Stanisic D., 2015. *The European Capital Markets Study: The Estimation of the Financing Gap of SMEs*, Duisenberg School of Finance, Amsterdam
- Singh H., Gopal R., L.X., Risk and Return of Investments in Online Peer-to-Peer Lending., pp.1–6.
- Siva, N., 2014. Crowdfunding for medical research picks up pace. *The Lancet*, 384(9948), pp.1085–1086.
- Smith, R.J. & Merchant, R.M., 2015. Harnessing the crowd to accelerate molecular medicine research. *Trends in Molecular Medicine*, 21(7), pp.403–405.
- Startup Europe Crowdfunding Network, 2014. Support services to foster the crowdfunding environment in Europe focused on web entrepreneurs.
- Strausz, R., 2015. Crowdfunding, demand uncertainty, and moral hazard - a mechanism design approach.
- Tech City News, 2008. *The Future of Crowdfunding*. , p.2008.
- Thaker, D. et al., 2015. A Conceptual Paper on Crowdfunding with Reference to Entrepreneurs and Investors in India. , 5(1041).
- The Crowd Data Centre, 2014. *Mapping - The State of The Crowdfunding Nation Documenting The Global Rise of eFinance & the eFunding Escalator*,
- The World Bank, 2013. *Crowdfunding's Potential for the Developing World*.
- Tobergte, D.R. & Curtis, S., 2013. SUMMARY RECORD OF THE 17TH MEETING OF THE EXPERT GROUP OF THE EUROPEAN SECURITIES COMMITTEE.
- Tomczak, A. & Brem, A., 2013. A conceptualized investment model of crowdfunding. *Venture Capital*, 15(January 2015), pp.1–25.
- Torjesen, I., 2015. Crowdfunding sought for study that will provide first images of human brain on LSD. *Bmj*, 350(mar05 4), pp.h1215–h1215.
- Torkanovskiy, E., 2016. Non-equity Crowdfunding as a National Phenomenon in a Global Industry: The Case of Russia. , pp.1–251.
- Turan, S.S., 2015a. Financial Innovation - Crowdfunding: Friend or Foe? *Procedia - Social and Behavioral Sciences*, 195, pp.353–362.
- Turan, S.S., 2015b. Stakeholders in equity-based crowdfunding: Respective risks over the equity crowdfunding lifecycle. *Journal of Financial Innovation*, 1(2), pp.141–151.
- Turner, A. et al., 2010. *The future of finance - The Socialisation of Finance. ... the Future of Finance*, p.294.
- Twintangibles, 2013. *Crowdfunding: The Scottish Perspective*.
- University of Cambridge; Ernst&Young, (Cambridge-EY, 2015), 2015. *Moving Mainstream - The European Alternative Finance Benchmarking Report*.
- Valančienė, L. & Jegelevičiūtė, S., 2014. Crowdfunding for Creating Value: Stakeholder Approach. *Procedia - Social and Behavioral Sciences*, 156(April), pp.599–604.
- Vasileiadou, E., Huijben, J.C.C.M. & Raven, R.P.J.M., 2014. Crowdfunding niches? Exploring the potential of crowdfunding for financing renewable energy niches in the Netherlands, pp.1–24.
- Views, D., 2014. *Crowdfunding for Sustainability at SMEs Crowdfunding for Sustainability at SMEs*.
- W. Joensen, D. & Mullerleile, T., 2016. *Limitless Crowdfunding? The Effect of Scarcity Management*, pp.1–251.
- Wang, H. et al., 2015. A process model on P2P lending. *Financial Innovation*, 1(1), p.3.
- Wang, P. et al., 2015. Exploring the critical factors influencing online lending intentions. *Financial Innovation*, 1(1), p.8.
- Wang, Hui; Greiner, Martina; Aronson, J.E., 2014. Peer-to-peer lending to small businesses. *Finance and Economics Discussion Series, Division of Research & Statistics and Monetary Affairs, Federal Reserve Board*, pp.1–26.
- Wardrop, R., 2015. *Crowdfunding: Opportunity & Challenges for Venture Capital*. EAFS, 25th March 2015, Brussels.

- Webb, C. O., Ackerly, D. D., & Kembel, S. W., 2008. Phylocom: software for the analysis of phylogenetic community structure and trait evolution. *Bioinformatics*, 24(18), 2098-2100.
- Weigmann, K., 2013. Tapping the crowds for research funding. *EMBO Reports*, 14(12), pp.1043–1046.
- Wells, N., 2013. The Risks of Crowdfunding. *Risk Management*, (March), pp.26–29.
- Wenzlaff, K. & Rohler, D., 2011. Crowdfunding schemes in europe. *European Expert Network on Culture*, pp.2–59.
- Wessel, M. et al., 2015. A Lie Never Lives to be Old: The Effects of Fake Social Information on Consumer Decision-Making in Crowdfunding. *European Conference on Information Systems*, pp.1–16.
- Wheat, R.E. et al., 2013. Raising money for scientific research through crowdfunding. *Trends in Ecology and Evolution*, 28(2), pp.71–72.
- Wieck, Enrico; Bretschneider, Ulrich; Leimeister, J.M., 2013. Funding From the Crowd: an Internet-Based Crowdfunding Platform To Support Business Set-Ups From Universities. *International Journal of Cooperative Information Systems*, 22(03), p.1340007.
- Willfort, R. & Weber, C., 2016. The Crowdpower 2.0 Concept: An Integrated Approach to Innovation That Goes Beyond Crowdfunding., pp.1–251.
- Wilson, K.E. & Testoni, M., 2014. Improving the role of equity crowdfunding in europe’s capital markets. *Breugel Policy Contribution*, (9), pp.1–14.
- Witt, T., 2015. Crowdfunding for science, research and science communication.
- Xu, Yejun; Enrique Ribeiro-Soriano, D.; Gonzalez-Garcia, J., 2015. Crowdsourcing, innovation and firm performance. *Journal of Managerial Psychology*, Vol. 30 No, pp.pp. 645–658.
- Xu, A. et al., 2014. Show Me the Money! An Analysis of Project Updates during Crowdfunding Campaigns. *Proceedings of the 32nd annual ACM conference on Human factors in computing systems*. ACM, 2014., pp.591–600.
- Yan, J., Yu, W. & Zhao, J.L., 2015. How signaling and search costs affect information asymmetry in P2P lending: the economics of big data. *Financial Innovation*, 2014(2015), pp.1–11.
- Yang, L. & Siu-king, V., 2012. Performance As a Signal To Information Asymmetry Problem in Online Peer-To-Peer.
- Zablit-schmitz, I. & Development, W.B., 2015. "Funding Research, Innovation and Culture in a New Digital Age: Challenges and Opportunities for European Crowdfunding Platforms".
- Zhang, B., & Srihari, S. N., 2004. Fast k-nearest neighbor classification using cluster-based trees. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 26(4), 525-528.
- Zhang, T. et al., 2014. Trust Building in Online Peer-to-Peer Lending. *Journal of Global Information Technology Management*, pp.250–266.
- Zhang, Z., 2014. Credit Risk Preference in E-finance: An Empirical Analysis of P2P Lending. *Association for Information Systems AIS Electronic Library (AISeL)*.
- Zheng, Haichao, Jui-Long, Hung Zihao Qi, B.X., 1999. The role of trust management in reward-based crowdfunding. *Int J Logistics Management*.
- Zilber S.N., Silveira F., de Carvalho L.F., I. a. G., Crowd funding as an alternative for new ventures funding in emerging countries.

How to obtain EU publications

Free publications:

- one copy:
via EU Bookshop (<http://bookshop.europa.eu>);
- more than one copy or posters/maps:
from the European Union's representations (http://ec.europa.eu/represent_en.htm);
from the delegations in non-EU countries (http://eeas.europa.eu/delegations/index_en.htm);
by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm) or
calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (<http://bookshop.europa.eu>).

The study assesses if alternative finance has the potential to help Europe address the problem of access to finance for innovative companies and bridge the gap in terms of access to risk capital, and if EU action is needed to support development of the sector. The study is structured around three main objectives 1) quantifying and qualifying the size of the alternative market for research and innovation; 2) analysing the challenges limiting development of the AF, and AF for research and innovation in particular; 3) providing final recommendation of EU actions to address those challenges and to exploit the opportunities of alternative finance for research and innovation.

Studies and reports

