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Is there a Market for Ideas in Portugal?

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Bio

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Abstract

Ideas are the roots of the innovation process and they can influence significantly final products. Markets for Ideas (MFI) are marketplaces where knowledge owners and knowledge seekers trade innovations.

Over the last years, scholars have studied this subject defining the main characteristics of the MFI. The extant literature has focused its attention mainly on the main concepts associated to MFI producing very few empirical evidences about their characteristics and performance.

In the recent past, Portuguese public authorities have put considerable efforts in the processes of idea generation and its commercialization, most notably through the implementation and funding of idea contests.

Using a remarkable example of longevity of a Portuguese idea contest, Poliemprende, developed by polytechnic academic organizations, the present dissertation evaluates whether Poliemprende can be considered a MFI.

The content analysis and the survey implemented involving 33 coordinators of Poliemprende, failed to gather enough strong evidence that this contest is a Market for Ideas, mainly due to external barriers, most notably bureaucracies and the lack of investors.

Keywords: Markets for Ideas, Knowledge Markets, Open Innovation, Innovation

JEL-Codes: O30; O31; O34

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1. Introduction

It is well known that innovation is important for the competitiveness of regions in the global economy (Gibson and Naquin, 2011). To be competitive, regions must develop mechanisms to effectively transfer the innovations from the laboratories to firms or markets (Gibson and Naquin, 2011). Thus, the importance of the innovation is not only at the macro-economic level but also at the micro-economic level.

Considering the innovation process, ideas are crucial for the quality and the efficiency of such a process (Kornish and Ulrich, 2014). Ideas can be defined as an opportunity to create value (Kornish and Ulrich, 2014). Thus, depending on their stage, an idea can be associated with an invention (e.g., when an inventor has an idea for a new product) or an innovation (e.g., when an inventor launches a new product into the market) (Natalicchio et al., 2014).

‘Markets for Ideas’ (MFIs) is a concept underlying with the open innovation paradigm (Natalicchio et al., 2014; Chatterji and Fabrizio, 2015). According to the literature, MFIs are (virtual) marketplaces where knowledge owners and knowledge seekers trade innovations (Gans and Stern, 2010; Dushnitsky and Klueter, 2011; Natalicchio et al., 2014). Knowledge owners are the agents who develop new knowledge and technologies and want to sell their innovations; knowledge seekers are the firms or investors who want to buy those innovations. The importance of MFIs lies at the fact that they influence strategic choices such as the timing and frequency of licensing (Gans et al., 2008; Chatterji and Fabrizio, 2015) and inventor commercialization decisions (Gans, Hsu, and Stern 2002; Chatterji and Fabrizio, 2015).

The literature available is mainly of theoretical nature, involving the discussion of the main characteristics (Gans and Stern, 2010; Natalicchio et al., 2014). The very scarce empirical literature has assessed how the characteristics of MFIs can influence the performance of such markets (e.g., Dushnitsky and Klueter, 2011; Garavelli et al., 2013). However, such empirical contributions focus their attention on technological frontier countries. Thus, the main contribution of the present dissertation is to develop an empirical study considering the context of a follower country, most notably Portugal, where the economic valorization of ideas faces several problems (Gibson and Naquin, 2011), including the low number of patents and the difficulties of business creation.

Since Portugal constitutes a follower country, the main interest of such case study is to evaluate if the characteristics discussed in the literature are present and what are the particularities of this case when comparing with a case of a technology frontier country, like the North American market. In first place we should highlight the fact that the Portuguese context is characterized by the low efforts in the innovation (e.g., low number of patents) and by evaluating if a MFI exists in Portugal we can have a better understanding about its impact in a follower country. Secondly, we should notice that the North American context is characterized by the tolerance to the risks of the business creation while the European context is not so tolerant to the risk. This work is an empirical contribution which provides some insights on the differences between these contexts.

In Portugal the process of idea generation and its transaction/commercialization has been subject of large interest by both science and political authorities (Gibson and Naquin, 2011), and substantial efforts and activities have been put in place to facilitate that type of transaction, namely through idea contests (e.g., Poliempreende, IUP25K, Ideias em Caixa). Thus, the aim of the present dissertation is to add to the empirical literature on MFIs gathering evidence on rather unexplored context (Portugal) by assessing whether idea contests might be classified as MFIs. Thus, based on the literature available and the theoretical insights developed around MFIs, the purpose of the present study is to assess whether the elements discussed in the literature to define MFIs play particular role in Portuguese idea contests using Poliempreende as a case study. The Poliempreende is an initiative that exists since 2003 which aims, through a contest of ideas and business plans, evaluate and reward projects developed and presented by students, graduates and teachers of the institutions involved (mainly polytechnic and non-integrated institutes). Given that Poliempreende involves ideas and the transaction of ideas and has been undertaken regularly (on a yearly basis) over more than 10 years, we considered it as a relevant case study.

The next section is dedicated to the literature review associated to MFIs where it is discussed the concept and the main characteristics of these markets. It is also discussed the main empirical research around MFIs. Section 3 regards to the methodological considerations and in Section 4 it is exposed and discussed the empirical results. Finally, Section 5 concludes the study by putting forward the main contributions of the study, limitations and paths for future research.

2. Literature review on Markets for Ideas (MFIs)

2.1 Definition

Markets for Ideas (MFIs) are defined as marketplaces where buyers and sellers trade ideas (Gans and Stern, 2010; Garavelli et al., 2013; Natalicchio et al., 2014). Such ideas can be in form of knowledge, business plans or technologies depending whether they are raw or market ready ideas (Natalicchio et al., 2014).

This is an emerging concept associated with the open innovation paradigm and its characteristics can be crucial for the competitiveness of the organizations (Chatterji and Fabrizio, 2015). Concerning this, organizations are aware of the relevance of the exploration of the external sources of knowledge to sustain and improve their competitiveness (Grant, 1996; Natalicchio et al., 2014; West et al., 2014).

When analyzing this concept it is crucial to consider three main dimensions (cf. Table 1): the knowledge owners (Garavelli et al., 2013), the knowledge seekers, and the ideas. Knowledge owners represent the supply side of these markets and they are the agents who develop the ideas that will be traded on such markets. They can be individuals such scientists, investigators, students or general public, or even organizations such R&D laboratories, universities or companies (Arora and Gambardella, 2010; Natalicchio et al., 2014).

Table 1: Characterization of the main dimensions of MFIs

Dimension	Characteristics	Represented by
Knowledge owners	Individuals/organizations that own knowledge or technologies	General public, scientists, investigators, students, R&D laboratories, universities, companies
Knowledge seekers	Organizations that want to explore new knowledge or technologies	Companies, Venture Capitalists, Business Angels
Ideas	Knowledge or innovations in form of technologies or business plans	Business plans, patents or licenses

Source: own elaboration

On the demand side there are the knowledge seekers who can be represented by organizations that have their needs and want to internalize innovations developed by external sources. These agents are often represented by companies or venture capitalists that have the willingness to explore new businesses or technologies (Natalicchio et al., 2014).

Ideas represent the goods that are traded in MFIs in form of business plans, patents or patent licenses between knowledge owners and knowledge seekers. This dimension is the most studied in literature as it involves a wider debate/discussion, specially concerning the definition of value and what are the main factors which can leverage the value. (Gans and Stern, 2010; Chaterjee and Rossi-Hansberg, 2012; Kornish and Ulrich, 2014; Natalicchio et al., 2014; Chatterji and Fabrizio, 2015).

Markets for Technologies (MFTs) and MFIs are related concepts, with the former involving the transaction of knowledge as a good (Arora and Gambardella, 2010; Dushnitsky and Klueter, 2011). Although there is some overlapping between these two concepts (e.g., the appropriability, the information asymmetries and the commercial valorization of the knowledge/ideas), to the best of our knowledge, the similarities and differences between these concepts are not explicitly described in the literature. This, however, is beyond the necessary stricter scope of the present dissertation and therefore is not explored further.

2.2. Main characteristics of MFIs

MFIs are associated with some core characteristics: value, appropriability, non-invented here syndrome, adverse selection, and scope and market boundaries.

2.2.1 Value

The value of an idea is one of the biggest concerns around the MFIs discussion (Gans and Stern, 2010; Chaterjee and Rossi-Hansberg, 2012; Dushnitsky and Klueter, 2011; Garavelli et al., 2013; Natalicchio et al., 2014). In the first place we should note that an idea is an intangible good and, thus, it is difficulty of determine its value (Dushnitsky and Klueter, 2011).

Although non-rival in use, ideas have the particularity of being rival in value (Gans and Stern, 2010). This means that the number of knowledge seekers who have access to a given idea will decrease significantly the value of such idea (Gans and Stern, 2010; Kani and Motohashi, 2012). The main cause for such phenomenon is that when a knowledge owner develops an idea this will generate information and when he/she starts a negotiation with an eventual buyer (knowledge seeker) he/she will diffuse the information in the market and the reproducibility costs of that idea will decrease.

Natalicchio et al. (2014) refer that ideas can be raw or market ready and this can influence their value (cf. Table 2). A raw idea is an idea that needs some development before reaching the final market. Since this will imply some work for the knowledge seeker and there is some uncertainty about the economic success of the idea, these kind of ideas tend to have a lower value. Nevertheless, the scalability and the potential returns that an idea can generate might increase their value. Another characteristic that can increase the value of an idea is the disruptiveness or the novelty leading to the creation of a new market or opportunity.

Market ready ideas tend to have a higher value (Natalicchio et al., 2014) because the risk of failure is lower and there is more information about the returns they will generate, making the ideas more attractive for knowledge seekers. The scalability can increase or decrease the value of these ideas.

Complementary assets are also a characteristic that can influence the value of the ideas (Gans and Stern, 2003; Gans and Stern, 2010; Natalicchio et al., 2014). In other words, a given idea *per se* can be poor in value but if complemented with other innovations its value can raise.

Table 2: Relation between stage and value of ideas

Stage	Value	Cause
Raw	Low	Failure risk, no complementary assets
	High	Scalability, high returns that will generate potentially, high complementary assets, disruptiveness, novelty
Market-ready	Low	Not scalable, poor complementary assets
	High	High returns, high complementary assets

Source: own elaboration

Chatterjee and Rossi-Hansberg (2012) argue that the value of an idea determines whether an entrepreneur – a knowledge owner – will sell the idea to a knowledge seeker or spinoff. There are additional reasons that can lead a knowledge owner to sell or to spinoff the idea. In first place, the knowledge owner might not have the necessary resources or competences to explore the idea successfully. For example, a scientist or investigator might not have management skills to spinoff an idea.

Another reason that can contribute for the decision of selling an idea instead of spinning off is the motivation of the knowledge owners. A given knowledge owner might not spinoff an idea because he/she does not want to do that.

2.2.2 Appropriability

Appropriability is the characteristic that concerns with who should detain the value of a given idea. The critical issue around the appropriability is the risk of misappropriation. This characteristic affects significantly the quality and the performance of a MFI because a higher risk of misappropriation tends to dissuade the participation of knowledge owners (Dushnitsky and Klueter, 2011).

The risk of misappropriation can be influenced by the characteristics of markets and ideas. As shown in Table 3, the risk of misappropriation increases when there are no institutional mechanisms in markets that impose rules or norms to protect the participants' interests. The importance of such mechanisms is to increase the market safety and improve the efficiency motivating knowledge owners to participate and disclose their ideas without the risk of misappropriation (Gans and Stern, 2003). Furthermore, the nature of ideas can be a characteristic that influence negatively the risk of misappropriation because a given idea might not be subject of a patent (e.g., a business plan) making it more difficult to protect from misappropriation. Another characteristic that increases the risk of misappropriation is the adverse selection (see Section 2.2.4).

Table 3: Elements that influence the risk of misappropriation

Risk of Misappropriation	Cause
High	Absence of institutional mechanisms, adverse selection, nature of ideas
Low	Intellectual Property Rights, disclosure agreements, confidential information agreements, upfront payments

Source: own elaboration

A market where the rules and norms are clear tends to have a lower risk of misappropriation (Gans and Stern, 2010; Garavelli et al., 2013). The most common mechanisms in this case are patents but it is usual to find disclosure agreements and confidential agreements. Disclosure agreements are often imposed to knowledge owners guaranteeing a minimum level of information associated to ideas that allow knowledge seekers to assess them (Gans and Stern, 2010; Dushnitsky and Klueter, 2011, Garavelli et al., 2013). Confidential information agreements work as safety tools that avoid knowledge seekers to use the information which they have access during a negotiation to reproduce the ideas or disclose them to another knowledge owners that can use it inappropriately (Dushnitsky and Klueter, 2011; Garavelli et al., 2013).

Another aspect that can contribute positively to decrease the risk of misappropriation is the upfront payments which consist on a fee that those agents should pay to participate in a given market. This mechanism can have two purposes - being a rent for the agent who manages the market and being an entry barrier to malfeasant agents (Dushnitsky and Klueter, 2011).

Dushnitsky and Klueter (2011) refer that these payments are often imposed to knowledge owners. This can be a paradoxal behavior because not only knowledge seekers are the agents who have better conditions to pay but also because the participation in a MFI allows them to save search costs (Dushnitsky and Klueter, 2011, Natalicchio et al., 2014). The main reason for this is the fact that imposing a fee will dissuade the malfeasant individuals to try selling poor ideas as high quality ideas (Dushnitsky and Klueter, 2011). This phenomenon will make the market safer for both sides of the market because knowledge seekers will have the guarantee that the knowledge owner with whom they are negotiating is not a malfeasant and knowledge owners will be sure that there is a lower level of misappropriation.

As already discussed in Section 2.2.1 ideas are rival in value and such value decreases significantly according to the number of agents to whom a knowledge owner has revealed the idea. This can lead to a conflict of interests between knowledge owners and knowledge seekers when they carry out a negotiation and the knowledge owner may not want to reveal all the information to a knowledge seeker because of the risk of misappropriation (Dushnitsky and Klueter, 2011; Natalicchio et al., 2014).

On the other hand, the knowledge seeker may need to assess the most information he/she can to evaluate the idea correctly (Dushnitsky and Klueter, 2011; Natalicchio et al., 2014). This conflict is described in literature as the Arrow information paradox (Natalicchio et al., 2014) or the information asymmetries issue (Dushnitsky and Klueter, 2011). There are mechanisms to avoid this issue, including disclosure mechanisms and confidential information agreements imposed both to knowledge owners and seekers.

Disclosure is the act of revealing the knowledge associated to an idea or innovation and this is important because often knowledge owners do not have all the details about ideas (Gans and Stern, 2010; Dushnitsky and Klueter, 2011; Natalicchio et al., 2014). Considering the knowledge seekers point of view, the disclosure allows them to evaluate the full potential of an idea letting them know the value and eventual

applications of such idea. On the opposite side, when a knowledge owner publishes the information about an idea he puts himself in risk of misappropriation (Dushnitsky and Klueter, 2011; Natalicchio et al., 2014), not only because some malfeasant individual can reproduce the idea but also because some other agent can use that knowledge to develop a better idea that can compete with the first (Pessoa, 2012).

The elements that characterize the appropriability are connected with each other, interacting and reinforcing each other – see Figure 1. Specifically, the risk of misappropriation can conduct to asymmetries in the information between the agents. To avoid this some MFIs use disclosure mechanism to make sure that knowledge owners reveal sufficient information to knowledge seekers. However, this disclosure can put in risk the intellectual property rights of the knowledge owners.

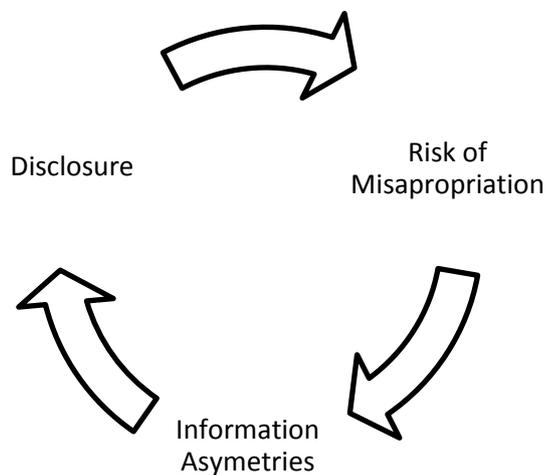


Figure 1: Relation between the three elements of appropriability

Source: own elaboration

2.2.3 Non-Invented Here Syndrome

When a firm acquires external knowledge to explore, some conflicts can emerge internally especially if this firm has R&D resources (e.g., human resources). Such conflicts are described in literature as the Non-Invented Here Syndrome (NIH) (Arora and Gambardella, 2010; Natalicchio et al., 2014). In other words the NIH syndrome is the opposition to the knowledge provided from external sources.

In the MFI perspective, the NIH is an issue that concerns only the knowledge seekers' side and it can be a constraint to their open innovation strategies (Natalicchio et al., 2014).

The NIH syndrome can depend on the absorptive capacity of the firms. The absorptive capacity is the characteristic that defines the ability of firms to explore knowledge from external sources (Arora and Gambardella, 2010). This characteristic depends on two factors (Arora and Gambardella, 2010): the ability to utilize and the ability to evaluate. The first refers to the firm's capacity of extracting value from a technology and it is linked to the technical competences of the firms, while the second refers to the capacity to predict the value and it is linked to technical and scientific competences of the firms (Arora and Gambardella, 2010).

Nevertheless, the NIH Syndrome can contribute positively for the innovation strategies of firms (Fosfuri and Rønne, 2009; Arora and Gambardella, 2010). Indeed, when a firm decides to acquire external knowledge the internal resources can increase their innovation efforts to overcome the external knowledge with better quality ideas creating a competition between the external sources and the internal R&D resources which leverages the innovation process of the firm (Fosfuri and Rønne, 2009; Arora and Gambardella, 2010).

2.2.4 Adverse selection

The adverse selection issue occurs when a malfeasant individual tries to sell an idea as a higher value idea when the real value is lower (Dushnitsky and Klueter, 2011).

This issue has its roots on the information asymmetries issue (see Section 2.2.2) and it happens because during a negotiation knowledge seekers do not have much information about the ideas, leaving room to an malfeasant individual try to sell a low quality idea as an higher quality one (Dushnitsky and Klueter, 2011).

As discussed by Roth (2007), market safety is one of the most important characteristics of a market and when the adverse selection is present in a MFI it could lead to a market failure.

Nevertheless, some elements can contribute to lower the level of adverse selection (as shown in Table 4). The openness of the market is one of the aspects that can increase the level of adverse selection (Dushnitsky and Klueter, 2011; Garavelli et al., 2013). In

other words, in the absence of selection mechanisms the willingness of the malfeasant individuals to participate is higher.

The presence of tacit knowledge associated to the ideas is another issue that can increase the level of adverse selection. This happens because tacit knowledge is associated to the experience of the knowledge owner and this makes harder to knowledge seekers evaluate the idea (Dushnitsky and Klueter, 2011). On the other hand, the presence of codified knowledge reduces the level of adverse selection (Kani and Motohashi, 2012) making easier to knowledge seekers evaluate the ideas since the knowledge associated to ideas is not specific to the experience of knowledge owners.

The closeness of the market can be the first characteristic that avoids the adverse selection problem. If the participation of knowledge owners is restricted to some individuals with specific characteristics (e.g., education or professional experience) this will reduce the risk of participation of malfeasant individuals (Garavelli et al., 2013).

Usually the agents who manage MFIs develop mechanisms to avoid this issue and increase market safety. Upfront fees, selection and disclosure procedures are among the mechanisms most often used to avoid malfeasant individuals. Upfront fee, as already discussed in Section 2.2.2, are usually imposed to knowledge owners with the specific purpose of dissuade malfeasant individuals to participate in MFIs (Dushnitsky and Klueter, 2011). Selection procedures occur during the registration of a potential knowledge owner in a MFI and he/she has to submit information about his experience and education. Then the agent who manages the market may accept or reject the registration (Garavelli et al., 2013).

Table 4: Relation between adverse selection level and causes

Adverse Selection Level	Causes
High	Market openness, tacit knowledge
Low	Codified knowledge, market closeness, upfront fees, selection procedures, disclosure procedures

Source: own elaboration

As discussed in Section 2.2.2, the main purpose of the disclosure is to give access to knowledge seekers to a minimum level of information allowing them to evaluate the proper value of the ideas. This is the most common mechanism described in the empirical literature (Dushnitsky and Klueter, 2011; Garavelli et al., 2013) and it occurs when a given knowledge owner wants to sell an idea and he needs to publish some information about the knowledge associated to the idea. If the information that was

revealed by the knowledge owner is not enough the agent who manages the market can deny the transaction of the idea (Dushnitsky and Klueter, 2011).

2.2.5 Scope and market boundaries

MFIs can be characterized according to their scope and boundaries. The scope is the dimension that defines whether markets are open or closed and boundaries define whether markets are internal or external.

The scope is the dimension that regards to knowledge owners. A given MFI is open or closed when the participation is restricted to a certain type of knowledge owners or not. In other words, in an open MFI the participation is allowed to any possible knowledge owner while in a closed MFI the participation is limited (Garavelli et al., 2013; Natalicchio et al., 2014).

Opening a MFI to all possible knowledge owners can impact significantly the number of participants and the innovation process (cf. Table 5). If a given MFI is open it will create a heterogeneous pool of knowledge owners and knowledge seekers. Such heterogeneity emerges because of background differences between agents (e.g., education, professional experience, competences) which can lead to a propitious environment for radical innovations (Garavelli et al., 2013; Natalicchio et al., 2014).

Table 5: Characteristics of the scope dimension

Openness	Advantages	Higher number of participants, heterogeneity between agents, potential of radicalness on the innovation process
	Disadvantages	Attraction of malfeasant individuals, problems must be more defined
Closeness	Advantages	Homogeneity between agents, market safety, problems can be less defined
	Disadvantages	Lower number of participants, innovations are essentially incremental

Source: own elaboration

Nevertheless, when a given MFI is open there are some issues that can emerge like the participation of malfeasant individuals (Garavelli et al., 2013). This issue can compromise the safety and the quality of the market.

Heterogeneity is also a characteristic that can bring issues to a given market. When knowledge owners have competences or knowledge from a distant field from which knowledge seekers are and they are dealing with a problem-solving contest, knowledge seekers need to define the problems more clearly. This means that the constraints should be clearly defined because knowledge owners cannot be aware about them (Garavelli et al., 2013).

Regarding the boundaries, there are two different approaches that can define if a MFI is internal or external (as shown in Table 6). While internal MFIs are managed directly by the knowledge seeker, external MFIs are managed by an independent agent (Garavelli et al., 2013). The differences between these two approaches can impact on both sides of the market.

Table 6: Characteristics of the boundaries dimension

Internal	Advantages	Direct relation between supply and demand, branding effect
	Disadvantages	Firms can reveal innovation needs, higher absorptive capacity needs
External	Advantages	Higher number of participants, anonymity of knowledge seekers, fairness
	Disadvantages	Lower cooperation between knowledge owners, risk of misappropriation

Source: own elaboration

Since internal MFIs are managed directly by the knowledge seeker these markets usually operate in a problem-solving mode. This means that it is the knowledge seeker who launches contests to solve a given problem and knowledge owners must develop ideas for that. This behavior makes the relation between the supply and demand clearer (Garavelli et al., 2013).

The brand of the knowledge seeker can also be a positive contribute for an internal MFI attracting knowledge owners to participate on the brand innovation process (Garavelli et al., 2013).

If on one hand internal MFIs can contribute for the brand development, on another hand it can be an issue for the competitiveness of firms allowing the other firms to know what are the needs of the firm that owns the MFI (Garavelli et al., 2013).

Absorptive capacity is a characteristic which knowledge seekers need to develop in internal MFIs since in this type of market the competitiveness is achieved by managing and exploiting the pool of knowledge owners (Garavelli et al., 2013).

In external MFIs the pool of knowledge owners and seekers is wider, as it happens in open MFIs. This is a positive aspect since it increases the market thickness giving the possibility to the agents of both sides to negotiate a wider pool of ideas (Roth, 2007; Gans and Stern, 2010; Kani and Motohashi, 2012; Garavelli et al., 2013; Natalicchio et al., 2014).

Since external MFIs are managed by an independent agent, knowledge owners can have the notion of fairness on the rewards system and this can be a motivational driver that leads to a higher level of participation (Garavelli et al., 2013).

External markets are also characterized by the weak cooperation between knowledge owners (Garavelli et al., 2013) and this can limit the market since the complementary assets might not be exploited properly.

2.3 Empirical research on MFIs

Although “Markets for ideas” (MFIs) have been subject of discussion by the scholars during the last years, there are only a few empirical studies, which encompasses only two main contributions: Dushnitsky and Klueter (2011) and Garavelli et al. (2013).

Dushnitsky and Klueter (2011) developed a study which evaluates if there is a knowledge market with the same prominence as eBay on the markets for goods identifying 30 markets (cf. Table 7) according to several criteria.

They identified 2 different types of markets: the Intellectual Property Markets (IPM) and Venture Capital Markets (VCM). While IPM are markets focused on innovations that are subject of patents or licenses VCM are markets where ideas are materialized in form of business plans or business opportunities (Dushnitsky and Klueter, 2011).

Considering the case of IPM there are two relevant aspects. The first is the fact that knowledge seekers usually are large firms that intent to explore external knowledge and reduce the search costs (Dushnitsky and Klueter, 2011). The second is the fact that in these markets, ideas are sustained in codified knowledge and the firms that buy external knowledge do not depend from the knowledge owners to explore such innovations after the trade (Dushnitsky and Klueter, 2011).

If in IPM ideas are based on codified knowledge in VCM ideas can be based on tacit knowledge and knowledge seekers may need to cooperate with knowledge owners after the trade (Dushnitsky and Klueter, 2011).

There are two main conclusions that we can highlight from this work. The first is the fact that there is not a MFI with the same dominance as eBay has in the markets for physical goods (Dushnitsky and Klueter, 2011). The main reason for that is because trading intangible goods, such as ideas, creates challenges that have no similarity with physical goods.

Table 7: Online knowledge marketplaces

Category	Firm	Website
IPM	Flintbox	www.flintbox.com
	iBridgenetwork	www.iBridgenetwork.com
	Knowledgeexpress (Free eMarket)	www.knowledgeexpress.com
	NewIdeaTrade	www.newideatrade.com
	Patentcafe (2XFR)	www.patentcafe.com
	Pharmalicensing	www.pharmalicensing.com
	Pharma-Transfer	www.pharma-transfer.com
	SparkIP	www.sparkip.com
	Taeus	www.taeus.com
	Techtransferonline	www.techtransferonline.com
	Tynax	www.tynax.com
Yet2	www.yet2.com	
VCM	ACE-Net (ActiveCapital)	www.activecapital.org
	Angel Investment	www.midatlanticinvestmentnetwork.com
	Angelsoft	www.angelsoft.net
	Bizbuysell	www.bizabuysell.com
	Businessfinance	www.businessfinance.com
	Fundingpost	www.fundingpost.com
	Go Big Network	www.gobignetwork.com
	go4funding	www.go4funding.com
	Mergernetwork	www.mergernetwork.com
	NVST	www.nvst.com
	Raisecapital	www.raisecapital.com
VCAOnline	www.vcaonline.com	
vFinance	www.vfinance.com	
Both ⁽¹⁾	Ideaconnection (IPM)	www.ideaconnection.com
	V-Capital (IPM)	www.v-capital.com

Source: adapted from Dushnitsky and Klueter (2011)

The second conclusion is that disclosure and upfront payment mechanisms can vary significantly between IPM and VCM. This can be because the protection of the codified knowledge plays an important role in IPM while the tacit knowledge is more important in VCM (Dushnitsky and Klueter, 2011). Nevertheless, disclosure mechanisms are equally important in both markets.

Garavelli et al. (2013) characterize the different existing MFIs crossing two differentiation dimensions - scope and boundaries. This framework allows evaluating how do the characteristics influence their capability to provide benefits for suppliers and buyers of the knowledge assets (cf. Figure 2).

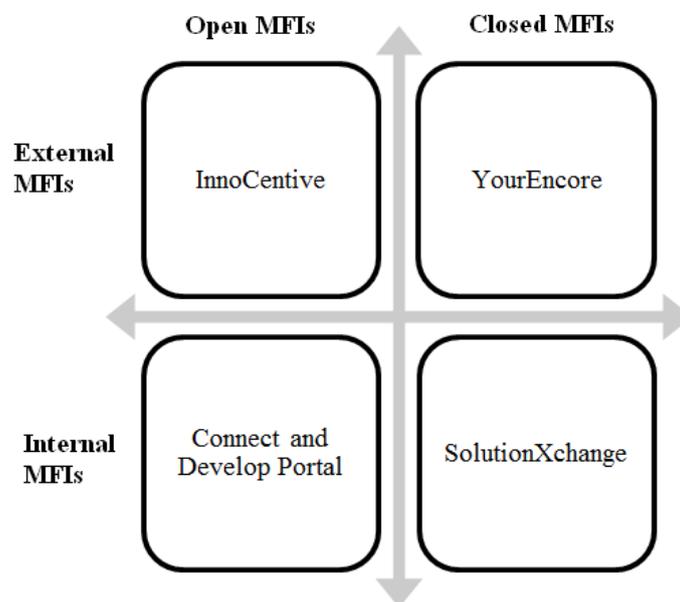


Figure 2: MFIs categories

Source: Garavelli et al. (2013).

InnoCentive was founded in 1998 by Eli Lilly and Co., a pharmaceutical company that owned the Prozac patent, with the intent to find valuable ideas to develop and commercialize (Garavelli et al., 2013). In 2005, this MFI was acquired by a private fund and became independent. This MFI has expanded to cover more knowledge areas, contributing to a higher number of knowledge owners and innovation contests (Garavelli et al., 2013).

Since InnoCentive is an open market, knowledge owners do not have to comply with specific requirements to participate in the contests and the rewards are a strong extrinsic motivation (Garavelli et al., 2013). To avoid issues related with the appropriability of the ideas, knowledge owners sign a solver agreement in advance to transfer the IP rights

to the seekers (Garavelli et al., 2013). On the other side, knowledge seekers have also to sign an agreement to avoid the misbehaving respect to the owners (Garavelli et al., 2013). These factors are important to the reliability of this MFI.

YourEncore was established by Eli Lilly and P&G in 2003 as a network of retired and veteran scientist and engineers (Garavelli et al., 2013). The selection process is based on the experience and the background of knowledge owners and is critical to guarantee the “*best-in-class expertise to manage and lead projects*” (Garavelli et al., 2013). IP issues are avoided with the confidentiality of the information generated and owners have to sign a confidentiality agreement before discuss a given idea with a seeker (Garavelli et al., 2013).

Connect and Develop Portal was founded in the early 2000s by P&G to promote the connection between external innovators and P&G (Garavelli et al., 2013). Being an open MFI, knowledge owners are invited to submit their ideas regardless their specific background (Garavelli et al., 2013). Owners can also submit their ideas directly to P&G even if those ideas were not solicited. Rewards are negotiated between P&G and the owners and there is not a standard compensation (Garavelli et al., 2013).

SolutionXchange was created in 2009 by an Indian company named Genpact (Garavelli et al., 2013). The innovation process is developed presenting problems to knowledge owners that may propose solutions in exchange for monetary rewards (Garavelli et al., 2013). The pool of knowledge owners consists in experienced industry professionals that need to submit information about their skills and industrial background during the registration. The applications are evaluated by a team that may accept or reject those (Garavelli et al., 2013). When submitting an idea, knowledge owners need to state clearly the knowledge covered by IP rights and SolutionXchange may negotiate to obtain such rights (Garavelli et al., 2013).

The multiple case study developed by Garavelli et al. (2013) led to several conclusions. It was noted that the openness or closeness can influence the interaction between the knowledge owners. Open MFIs are not successful promoting the sharing of knowledge. This sharing of knowledge is more visible in closed MFIs due to the homogeneity of owners (Garavelli et al., 2013).

The notion of fairness is another aspect which can be influenced by the characteristics of MFIs. Garavelli et al. (2013) argue that the reward system needs to be according to

the efforts promoted by owners and this is crucial to the success of a MFI. In internal MFIs rewards are negotiated while in external MFIs the fairness is perceived since the market is regulated by a neutral agent.

The heterogeneity in the pool of the knowledge owners is another issue that is discussed. In open MFIs owners can be from a different knowledge domain from the problem. In such cases, requests need to be well defined so they can submit their ideas (Garavelli et al., 2013). In closed MFIs, the homogeneity and the closeness in terms of knowledge domains permit to launch requests with less details and constraints to develop acceptable solutions (Garavelli et al., 2013).

Regarding the absorptive capacity, in internal MFIs the competitiveness is achieved by seekers managing and exploiting the pool of knowledge owners but such management may require proper capabilities and resources while in external MFIs such capabilities and resources can be fewer (Garavelli et al., 2013).

Finally, the radicalness of the innovations is another aspect discussed by Garavelli et al. (2013). In open MFIs, the heterogeneity between knowledge owners and the distance in knowledge domains leverages the radicalness of innovation while in closed MFIs the homogeneity and closeness in terms of knowledge domains lead to incremental innovations.

3. Methodology

3.1. The case of Poliemprende

Poliemprende is one of the oldest idea contests developed in Portugal. This contest had its first edition developed in 2003 by the Polytechnic Institute (IP) of Castelo Branco and during the next years the participation was extended to IP Guarda and IP Viseu (Costa, 2013).

The number of schools which participate in this contest is considerable, covering almost all knowledge areas (e.g., natural sciences, health sciences, social sciences and engineering) and its longevity makes it a good case study to assess if effectively exists a MFI in Portugal.

In 2007, all Polytechnic Institutes were participating in this contest and in 2008, through a rotated coordination started by IP Coimbra (as shown in Table 8), the non-integrated schools, the University of Aveiro and Algarve became also members of Poliemprende (Costa, 2013).

Table 8: Entities which organized the different editions of Poliemprende

Edition	Organization
1	IP Castelo Branco
2	IP Castelo Branco
3	IP Castelo Branco
4	IP Castelo Branco
5	IP Castelo Branco
6	IP Coimbra
7	IP Viana do Castelo
8	IP Lisboa
9	IP Viseu
10	IP Guarda
11	IP Porto
12	IP Coimbra

Source: own elaboration

Nowadays, Poliempreende is seen as a national project which contributes for the development of the Portuguese economy through national and regional projects. This contest not only promotes the creativity and the spirit of innovation in students and former graduates but also helps sustainability of the older projects, monitorizing the market to avoid the death of the companies created through the Poliempreende (Costa, 2013).

The participants of Poliempreende can acquire business competences through workshops and seminars in the early stages of the contest. This is a structured way to guarantee the success of the projects which are created during the contest.

According to the information available at Poliempreende's website, the main purpose of this contest is to change the attitude of the academic actors through activities which valorize knowledge through the promotion of innovation and IPRs.

This way, the first activities of this contest consist in workshops where the participants can acquire competences about the purpose of the entrepreneurship and the main activities of the idea generation process (cf. Figure 3).

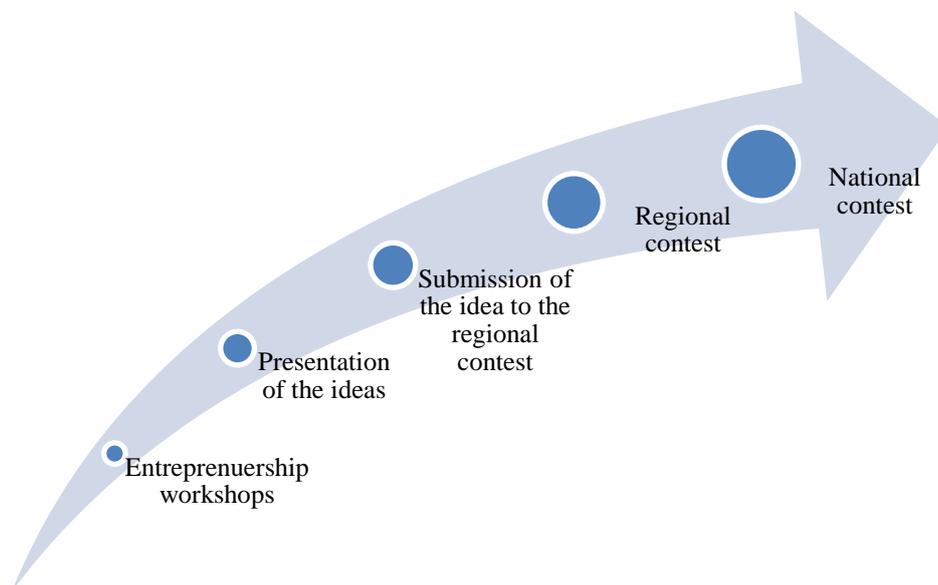


Figure 3: Poliempreende's stages

Source: own elaboration

After the workshops, the participants need to present their ideas to the regional contest (cf. Figure 3). In this stage, competitors submit information about their ideas through the website of the local institute. We can consider that this is the phase where the knowledge owners disclose their ideas to the regional jury.

The next phase of Poliempreende is the formal submission of the ideas to the regional jury (cf. Figure 3). Here, knowledge owners submit their business model plans to the jury.

The regional contest is developed by each local Institute and the jury and sponsors can be nominee by each Institute. The awards are defined by each Jury and can differ from each other.

The winners of the regional contests will be automatically selected for the national contest and the other candidates can be selected according to several criteria. Specifically, the ideas/projects must correspond to real intentions of implementation and might not be submitted to other idea contests. Each team must submit only one idea to the contest.

3.2. Research question and description of the survey

As referred earlier, the main question of the present study is to assess whether effectively exists a Market for Ideas (MFI) in Portugal with the characteristics discussed in literature. To do that, we use Poliempreende as a case study because this contest has been occurred regularly over more than 10 years.

The most common way to search for knowledge in MFIs is the creation of innovation contests (Garavelli et al., 2013). Such contests are characterized by three main theoretical issues (Garavelli et al., 2013): (a) the number of knowledge owners that can provide a solution; (b) the heterogeneity of expertise among knowledge owners; and (c) the motivations of knowledge owners to participate to the contests. While the number of owners that can provide a solution is important to make sure that the supply side is thick and thus, the knowledge seekers may find a pool of suppliers to negotiate with, the heterogeneity is crucial to allow the disruptiveness of innovation process and develop valuable ideas. The motivation of the knowledge owners is the main driver to ensure the participation of the knowledge owners in a given MFI and thus, feed the entire innovation process. This way, we may consider that Poliempreende has all these condition because (a) the pool of knowledge owners is wide (e.g., the students and former students), (b) heterogeneous (e.g., covers all the knowledge backgrounds) and (c) the knowledge owners are motivated to participate (e.g., own job creation). Since our main question is to evaluate the extent to which Poliempreende contest can be

considered a MFI, the most appropriate research method, according to Yin (2003), is an explanatory case study.

In the first phase, we developed a qualitative and a content analysis based on secondary sources in order to determine the evolution of this contest, identifying the main agents and processes of this contest. In other words, we assessed reports and the available public data (e.g., press releases and website's newsletters) from Poliempreende.

The second phase involved the implementation of a survey addressed to Poliempreende's coordinators in order to assess their perception regarding the characteristics identified in the literature. The main reason behind this is due to the fact that the available data did not allow us to evaluate the characteristics Poliempreende vis a vis the MFI literature.

The survey phase occurred in 3 stages: the development of the survey, the submission of the survey to the coordinators, and the data collection and preparation of the results (cf. Figure 4). The development of the survey included the identification of the characteristics which should be evaluated and also the identification of the target public. The target public encompassed the 49 coordinators identified in the Poliempreende's website (see www.poliempreende.ipp.pt).

To obtain a good rate of response, the strategy was to develop a short but insightful survey. Taken this is mind, the final survey included 8 questions where the perception of the coordinators could be measured in a Likert scale between 1 to 5, where 1 means that they totally disagree and 5 means that they totally agree with a given sentence (as shown in Appendix A). An additional question was made to assess who were the agents owning the IPR at the end of each Poliempreende's edition (e.g., competitors, schools, investors).

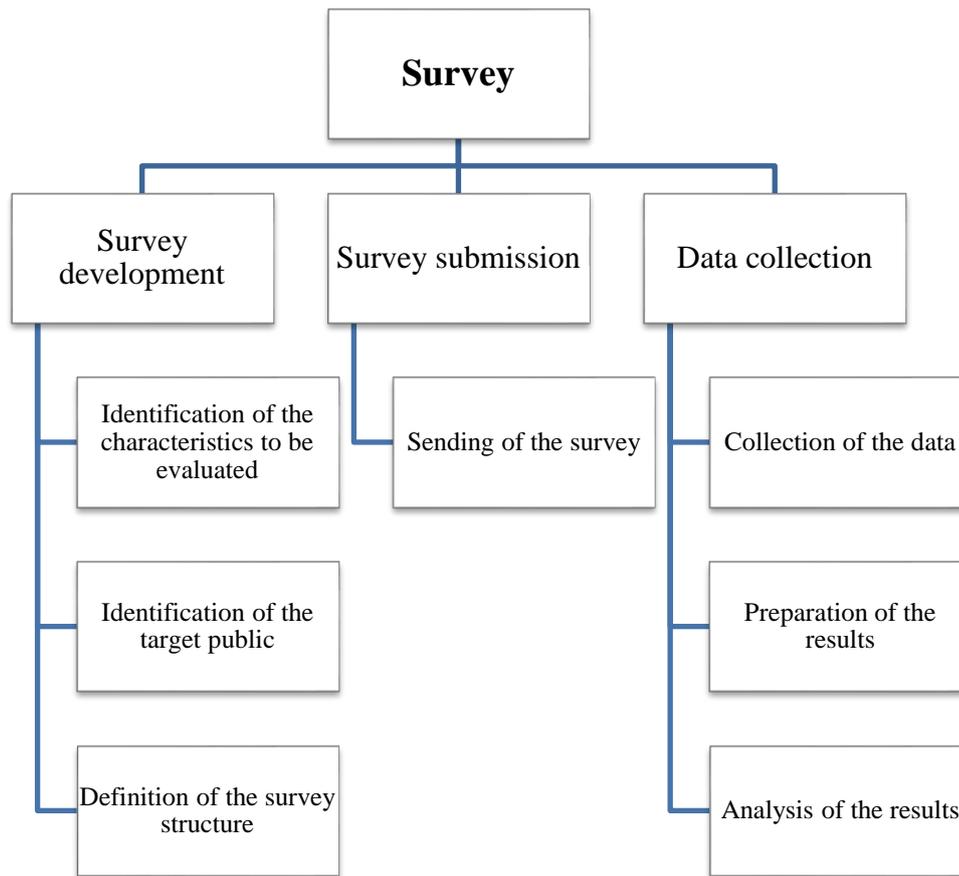


Figure 4: Structure of the survey phase
Source: own elaboration

The characteristics which received more attention in the conceptual literature are the value of the ideas, the adverse selection, the non-invented here syndrome, and the scope and boundaries and, because of this, we consider them the main characteristics of MFI (c.f. Figure 5). Since the non-invented here syndrome is a characteristic which regards to the knowledge seekers side, we chose to not assess this characteristic because it does not characterize a MFI. Regarding the scope and boundaries, these characteristics were defined in the research of the public data and we did not need to assess it in the survey. We also defined a group of characteristics which are not specifically associated with the MFI literature but we considered important to evaluate them in the case of Poliemprende (c.f. Figure 5) due to the fact that some of them are linked to the main characteristics (e.g., complementarity of ideas and the value of the ideas), allowing us to have a deeper insight in the performance of this contest. Those characteristics included the complementary of the ideas, the market thickness and the congestion.

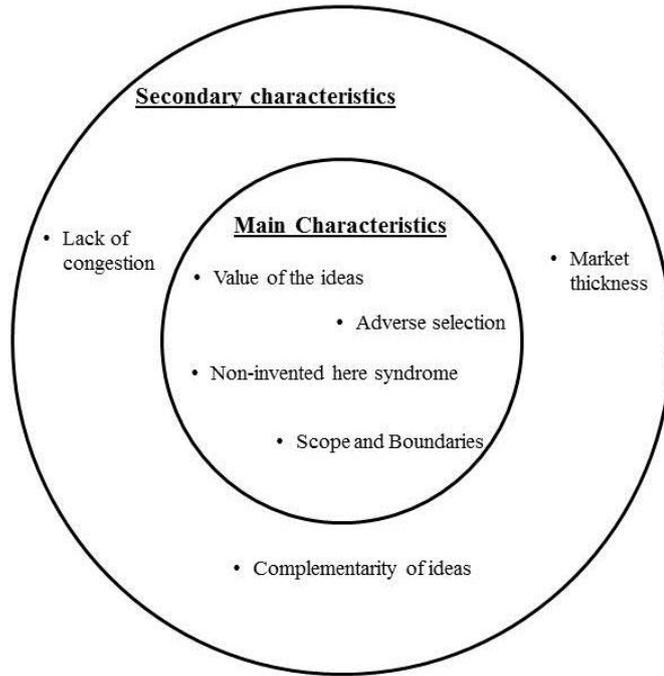


Figure 5: Main and secondary characteristics considered in Poliemprende's case

Source: own elaboration.

By evaluating the process of the presentation of the ideas and, consequently the disclosure, we can have a better understanding whether there is room to the information asymmetries and if the adverse selection is a phenomenon present in the case of Poliemprende. The first question regards to the performance of the presentation of the ideas (as shown in Appendix A) and it be particularly interesting if we consider the fact that during the early phases of Poliemprende the organization of this contest develops workshops. These workshops can be crucial to develop the participants' skills (i.e., communication and development of a good business plan) which allow them to have a good performance during the disclosure of the ideas to the jury.

The matching between the market needs and the evaluation of the ideas regards directly to the jury's capacity of evaluating the ideas concerning the real market needs. This question is important because it can influence significantly the reputation of this contest. It is important to a given MFI to decide which ideas can generate good returns and which not. A MFI which does a proper evaluation of the ideas can be a safety tool for the investors and this can be crucial to attract investors.

The market congestion is one of the characteristics which is not specific to the MFI literature. A market with a lack of congestion is a market where the transactions occur at a desired speed. This means that those transactions must be neither too slow nor too

fast. To evaluate such characteristic we chose to analyze the ratio between the number of businesses created and the number of participants. A higher ratio refers to a market where a great number of businesses are created even with a low number of participants which means that the opportunities to create businesses are high. On the opposite, a low ratio refers to a market where it is needed a huge amount of participants to create only one business. This means that the opportunities to create a business are low.

The quality of the ideas is an important characteristic which is linked with the value and affects significantly the reputation of a market and attracts investors. To assess the quality of the ideas we questioned the coordinators about how they saw the probability of the winning ideas have success in the market. Here, we consider a wider notion of quality comparing with the second question. Since the main goal of a MFI is to transact ideas, it is important to understand if at the end of the evaluation process the winning ideas have conditions to generate returns to the agents who will invest on it.

The market thickness is a characteristic which is not specific to the MFI literature but we consider it important to be evaluated in this context because it is important to understand if the number of knowledge owners and knowledge seekers is balanced, giving to the agents the possibility to negotiate a wider pool of ideas. A well reputed MFI has the capacity to attract investors (e.g., knowledge seekers) and this gives thickness to the market. Considering the fact that Poliemprende is developed by academic institutions, we may argue that the pool of knowledge owners is good or at least sufficient and this way, we asked the coordinators about the other side of the market - the knowledge seekers side.

The adverse selection is one of the most discussed characteristics of the MFI literature. This phenomenon is characterized by the act of trying to sell a low quality idea as a valuable idea. To evaluate if this malfeasant behavior is present in Poliemprende, we asked the coordinators if the competitors frequently overestimate the returns which would be generated by the ideas submitted to the contest.

The complementarity of ideas is another characteristic that we chose to evaluate because it can be important to leverage the value of the ideas, exploring the full potential of the ideas presented to the contest. To evaluate if this characteristic is present in Poliemprende, we questioned the coordinators if they consider the complementarity of the ideas as a characteristic which can leverage the value of the ideas. Since this contest

is developed by several academic institutions, the networking effect can be crucial to do that.

The value is the characteristic which has been subject of more discussion in the MFI literature and the evaluation of this characteristic is crucial to this case study. We asked the coordinators if they consider that the ideas submitted to the contest are value propositions for a given market need. Probably this question is one of the most difficult to evaluate since the concept of value can be too abstract but the main reason of this question is to evaluate if behind each idea there is a clearly identified market need.

The appropriability is also one of the main characteristics which has been subject of discussion in the MFI literature. This characteristic concerns about who owns the intellectual rights of the ideas. This characteristic can be a source of some problems if MFIs do not have the proper mechanisms to protect the knowledge owners and/or the knowledge seekers. To assess this characteristic we chose to evaluate the IPR in the case of Poliemprende. Thus, the final question regards to the IPR of the ideas submitted to Poliemprende. Here, we evaluated who are the agents that own the rights of the ideas developed in this contest and if the rights belong to a single agent or if they are shared between them.

3.3. Data gathering procedures

The process of data collection started with the analysis of the available public data (cf. Figure 6). This process consisted in the assessment of the documents published regarding Poliemprende. More specifically, we analyzed press releases, indicators, institutional presentations and the regulation of Poliemprende.

Unfortunately, the available data was not enough to allow us assessing the main characteristics of this contest (cf. Figure 6). Nevertheless, the analysis of the public data allowed us to identify 49 coordinators of each school which participates in this contest. Since some of these coordinators participate in this contest from the first edition, their experience and know-how could be the key to evaluate the main characteristics of Poliemprende.

Since the public data did not allow determining the characteristics of Poliemprende, we prepared a survey to address to our target public (cf. Figure 6). As already referred, the characteristics which we chose to assess were the appropriability, the value of the ideas,

the disclosure process, the market thickness, the lack of congestion and the adverse selection.

After the preparation of the survey, we submitted it to the coordinators sending a personalized e-mail (shown in Appendix B). The survey phase was expected to occur between middle of March of 2015 and beginning of April of 2015.

The response rate of the first attempt was not expressive (18 responses) to allow us to do a proper evaluation. As such, we sent a reminder to the coordinators who did not replied in the first attempt (cf. Figure 6) and in middle of April of 2015. In total 33 (out of the 49) responses were received which constitutes a reasonable response rate (67%) for a non-compulsory survey.

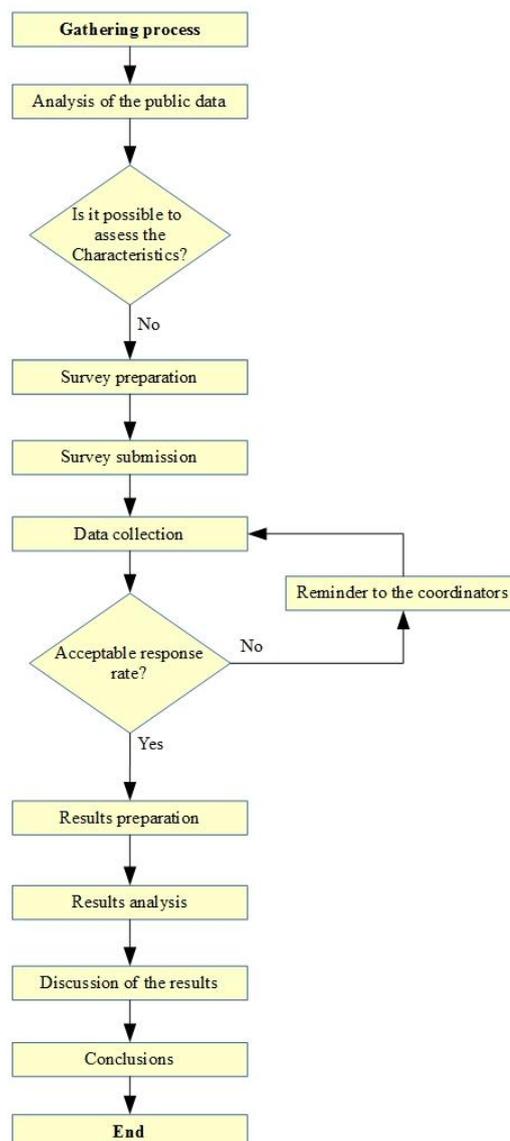


Figure 6: Gathering process flow
Source: own elaboration

4. Empirical results

To make the analysis of the results more efficient, we decided to group the different levels of perception of the 33 coordinators in two main groups, the “agree” and “do not agree” group (c.f. Figure 7). This way, we considered the survey’s responses between 1 and 3 as “do not agree” and the responses between 4 and 5 as “agree”. The fact that we consider a perception of 3 as “do not agree” can be subject of discussion, but since this is a central value of the rating scale, this means that the respondent is in doubt if he/she agrees or not with a given sentence. This means that the characteristic which regards to that sentence is not clearly present to the respondent and for that reason we consider it as a “do not agree” perception.

Regarding the performance of the presentation of the ideas, we should notice that one of the coordinators did not respond to this question (cf. Figure 7). Thus, 25 out of the 32 (78.1%) (cf. Figure 7) coordinators agree that this process was good while the remaining (21.9%) considered that the performance of this process was not good. Translating these results to the MFI literature, we can consider that according to the experience of these coordinators, the disclosure is effective in Poliempreende.

The skills developed by the participants during the initial stages of Poliempreende (e.g.; workshops and seminars) allow them to have a good performance during the disclosure of the ideas to the jury. Another reason for such effectiveness might be also explained by the fact that during the workshops, the organization of Poliempreende can have the first contact with the ideas and during the moment of the disclosure it can be easier to understand the information behind the ideas.

The matching between the market needs and the evaluation of the ideas regards to the jury’s capacity to do a proper evaluation of the ideas which is important for Poliempreende’s reputation and quality. When questioned about the matching between market needs and the evaluation of the ideas, 27 of the 33 (81.8%) coordinators considered this matching as good (cf. Figure 7). Considering these results, we can infer that in Poliempreende there is a good relation between the evaluation process and the market needs. A possible reason for the good relation between these two elements can be explained by the fact that the Polytechnic Institutes in Portugal are the educational institutions which are more geared to the industry and companies and, therefore have a closer relation with the markets.

Regarding the ratio between the number of businesses created by Poliempreende and the number of participants, only 2 of the 33 coordinators (6.1%) consider this ratio good (cf. Figure 7). At first, we can argue that this result is not aligned with the result of the first two questions. If the disclosure process is effective and the evaluation is perfectly aligned with the market needs, then there should be conditions for the business creation and the ratio between participants and businesses created should be good.

Nevertheless, this poor relation between the creation of businesses and the number of participants can be due to several reasons. The first can be the quality of the ideas which are submitted to the contest. As the participants are primarily students, i.e. individuals who do not have much experience in contact with the market, the quality of the ideas might not be as good as expected by the knowledge seekers (i.e., sponsors) and this can lead to a lower number of the businesses created. The second reason can be related to the motivations for the investment on the knowledge seekers side. If the knowledge seekers are risk averse they might not invest on the ideas and thus not create new businesses. An additional reason for this behavior can be explained by the characteristics of the participants. According to Costa (2013), the Portuguese students are characterized by the low propensity to the entrepreneurship due, among other things, to risk aversion.

The results further show us that the quality of the ideas is a characteristic that is more controversial for the coordinators. More specifically, 16 of the 33 coordinators (48.5%) consider this probability as good (cf. Figure 7). At first, it is logical that this is the most controversial question in the context of Poliempreende. The subjective nature of this concept makes it very difficult to set the value of an idea. Notwithstanding, we can consider the argument that the quality of the ideas submitted in this contest are good.

The capacity to attract investors is an important aspect which can bring thickness to the market. Considering the context of Poliempreende, only 9 of the 33 coordinators (27.3%) recognize the good capacity of Poliempreende to attract sponsors to invest in the ideas which are presented to the contest (cf. Figure 7). These results constitute a negative aspect because a contest with the longevity of Poliempreende should have a better reputation to attract investors.

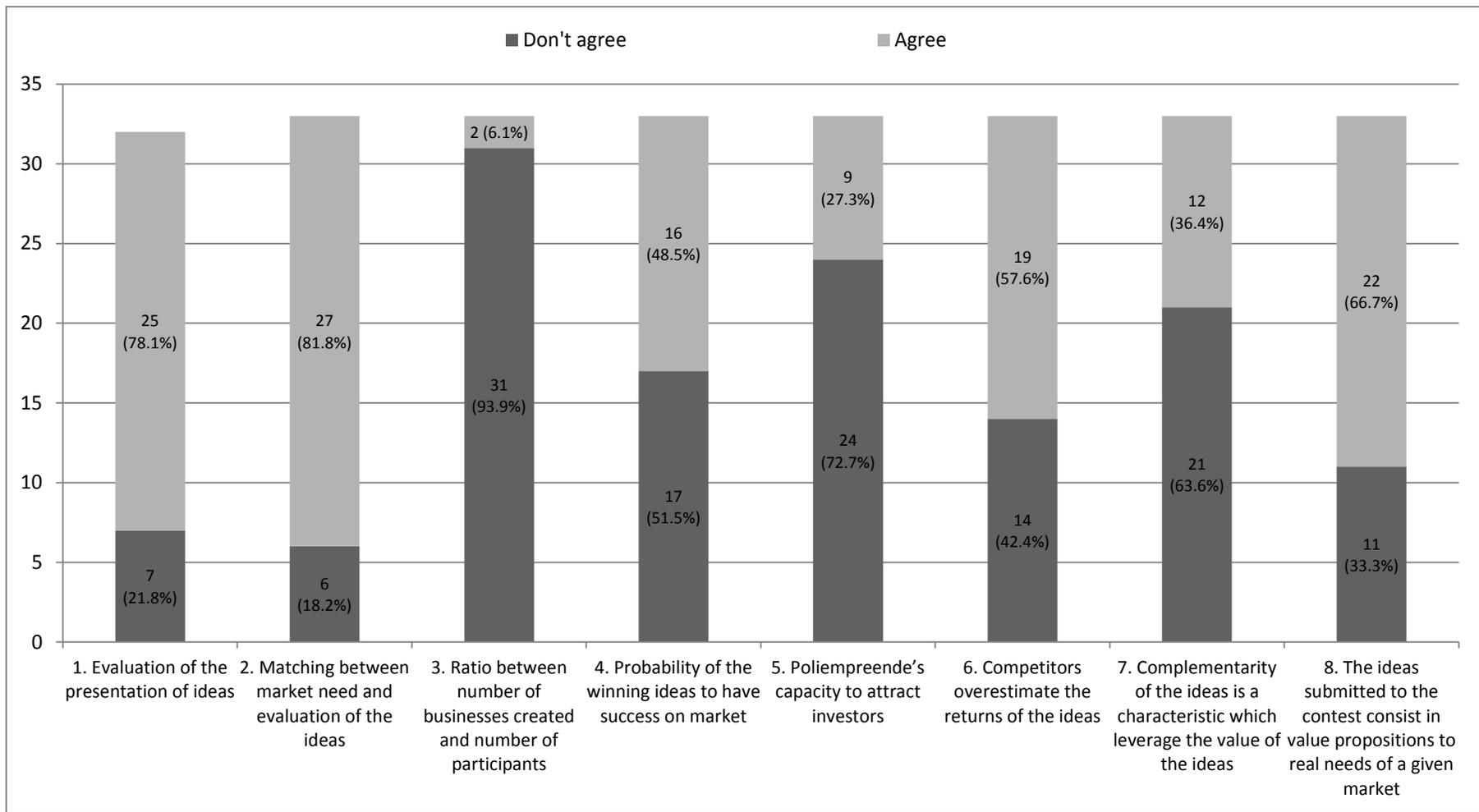


Figure 7: Markets for ideas –individual perceptions regarding the characteristics of Poliemprende

Source: own elaboration

The presence of the adverse selection is another characteristic which might potentially be present in a contest. When asked about the frequency of cases where a competitor can overestimate the returns of a given idea, 19 of the 33 coordinators (57.6%) agree that this occurs frequently in this contest (cf. Figure 7). Although the adverse selection is not a positive aspect, we consider this a normal behavior since the main goal of knowledge owners is trying to sell their ideas for the best price and this does not mean that the organization does not have control over the adverse selection.

As already referred, the complementarity of the ideas which are presented in this contest is another evaluated characteristic. Regarding this, 12 of the 33 coordinators (36.4%) recognize that the complementarity of the ideas is a characteristic which can leverage the value of the ideas (cf. Figure 7). There are several reasons which we can refer for this behavior. First, Poliemprende involves a large number of schools and occurs in two main phases, the regional and the national phase. This makes the pool of the available ideas wide and it would take too long to evaluate the complementarity of the ideas. The second reason could be the fact that the participants might not be interested in sharing the returns of their ideas with other participants.

The value proposition is one of the most important characteristics around the ideas which are submitted to a contest. In the case of Poliemprende, 22 of the 33 coordinators (66.7%) agree with the argument that in general, the ideas submitted to this contest are value proposition to given market needs (cf. Figure 7). These results are a positive aspect and can be explained by closer relation of Polytechnic Institutes with the markets which means that the participants have a good understanding about what are the needs of the market.

Regarding the IPR of the ideas submitted to Poliemprende, 23 coordinators referred that IPRs are owned by the participants while 8 referred that the participants and the schools own the IPR and 1 referred that IPR are shared by the participants, schools and investors (cf. Table 9) and 1 coordinator did not recognize anything about this question. This way, we can conclude that IPRs are usually detained by the knowledge owners and this can constitute a motivational driver for them to participate in this contest.

Table 9: Results of the survey regarding the IPR

	Competitors	School	Investor
Competitors	23	8	1
School	0	0	0
Investor	0	0	0

Source: own elaboration

Regarding the results of the survey, we can notice some heterogeneity of the results (cf. Table 10). Comparing the standard deviations, it is possible to see that such heterogeneity is more evident in the case of the questions 3 (ratio between number of businesses created and number of participants), 5 (Poliempreende's capacity to attract investors), 6 (competitors overestimate the returns of the ideas), and 7 (complementarity of the ideas is a characteristic which leverage the value of the ideas). Regarding the average of the perception of each question, we can argue that all the results of Table 10 are coherent with the results of the Figure 7.

Table 10: Survey results - averages and deviations

	Average perception	Standard deviation
1. Evaluation of the presentation of ideas.	3.78	0.78
2. Matching between market need and evaluation of the ideas.	3.94	0.65
3. Ratio between number of businesses created and number of participants.	2.09	0.93
4. Probability of the winning ideas to have success on market.	3.42	0.70
5. Poliempreende's capacity to attract investors.	2.85	0.93
6. Competitors overestimate the returns of the ideas.	3.45	0.99
7. Complementarity of the ideas is a characteristic which leverage the value of the ideas.	3.15	0.99
8. The ideas submitted to the contest consist in value propositions to real needs of a given market.	3.76	0.78

Legend: 1 – Totally disagree; 2 – Disagree; 3 – Do not agree and disagree; 4 – Agree; ; 5 – Totally agree

Source: own elaboration.

Considering the survey addressed to the coordinators, we can argue that some of the questions can be related between them and it is possible to aggregate them into two groups.

The first group regards to the questions number 2 (matching between market need and evaluation of the ideas), 4 (probability of the winning ideas to have success on market)

and 8 (the ideas submitted to the contest consist in value). Comparing the results of the survey, there is a small incongruence in the opinion of the coordinators. When questioned about the matching between market needs and the evaluation of the ideas and if the ideas are value propositions to the market needs, the coordinators recognize, in general, this characteristic but when questioned about the probability of success of the ideas in the markets, they tend to show lower levels of agreement.

If the evaluation process of the ideas is realistic and efficient and the ideas submitted to the contest represent, in general, value propositions to market needs then it is strange to not believe in the success of the ideas. Nevertheless, this might be due to the fact that the coordinators know that the entrepreneurial process can be very difficult, especially to a knowledge owner who does not have much experience in the market. These difficulties can be even harder if we consider the fact that Portugal is one of the most expensive countries in OECD for the business creation (Gibson and Naquin, 2011).

The second group regards to the questions number 3 (ratio between number of businesses created and number of participants) and 5 (Poliempreende's capacity to attract investors). These results are coherent because if Poliempreende has a lower capacity to attract investors then the relation between participants and the businesses created will be, consequently, low.

The survey results can be complemented with the indicators obtained from Poliempreende's website. The relation between the number of participants and the number of business created are shown in Figure 9 but first we should consider Poliempreende as a process by blocks where we have the inputs, the process and the outputs (as shown in Figure 7). In this specific case, the inputs are the number of participants (the knowledge owners) and the ideas in a raw stage because these will be the elements which will feed the entire process.

The process will be represented by the number of projects which are developed based on the raw ideas because during the contest the participants have the opportunity to participate in workshops which allow them to develop the ideas.

During the entire process, the ideas with a lower value will be eliminated and the best ideas will pass by all the process, leading to the creation of new businesses. This way, we consider the created businesses as the outputs of Poliempreende.

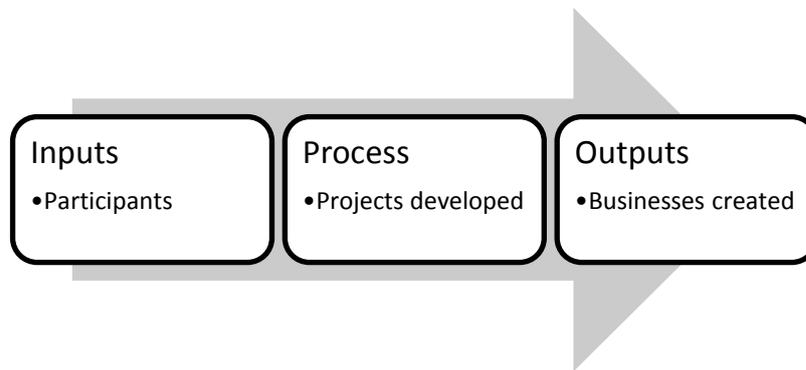


Figure 8: Poliempreende’s generic process

Source: Own elaboration.

Following this logic, we can argue that Poliempreende started slowly. The first edition was restricted to IP Castelo Branco and started with 62 participants with 24 projects submitted to the contest and no business created (cf. Figure 9).

Although the second and the third edition was extended to IP Guarda and IP Viseu, the number of participants and projects decreased significantly but from that contest one business in each editions was created (cf. Figure 9).

In the fourth edition, the number of Polytechnic Institutes increased and the pool of knowledge owners became wider. Thus, the number of participants and projects started growing.

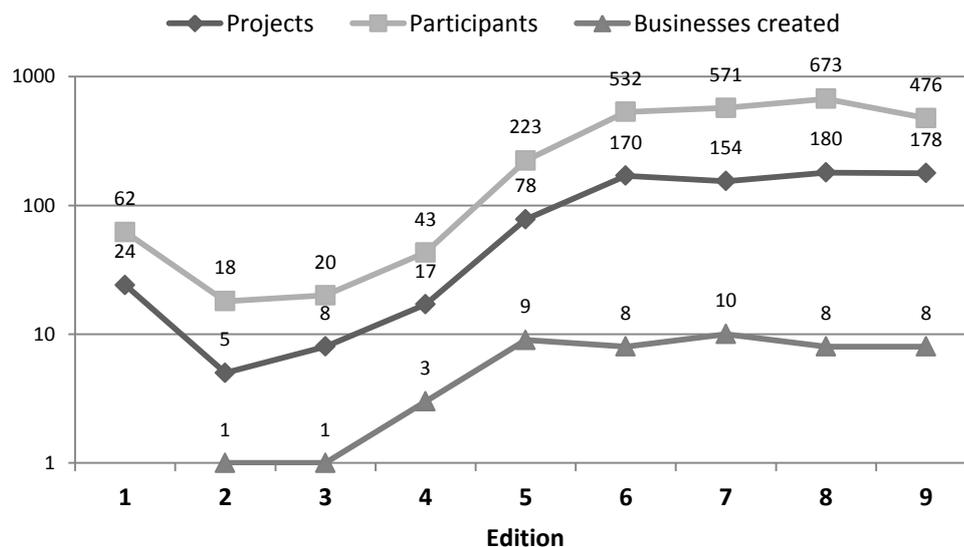


Figure 9: Evolution of Poliempreende

Source: own elaboration.

In the fifth edition the number of participants started increasing, reaching the 223 participants and 78 projects were submitted to content originating 9 businesses. This trend continued in the sixth edition, reaching the 532 participants and 170 projects submitted but the number of businesses was only 8 businesses. In the following editions, the number of participants and projects maintained the growing tendency but the number of businesses remained at the same level.

These indicators support the opinion of the coordinators that the ratio between the number of businesses created and the number of participants was low (cf. Figure 9). This can be explained by the low capacity of Poliemprende to attract investors (cf. Figure 9) and the quality of the ideas submitted through contest, as already referred.

Conclusions

The concept of MFI is still a novelty in the open-innovation perspective. Nevertheless, the literature available discusses the main characteristics around this subject (Gans and Stern, 2010; Chaterjee and Hansberg, 2012; Natalicchio et al., 2014) and there are only a few empirical contributions which study the existing MFIs (Dushnitsky and Klueter, 2011; Garavelli et al., 2014). By assessing if effectively it exists a MFI in Portugal, the present study is a contribution to add further empirical evidence to extant literature regarding MFI.

Considering the empirical literature, and by the best of our best knowledge, this is the only contribution which performed a detailed evaluation whether the characteristics discussed in the theoretical literature of MFI were present in a given case, especially within a context of a laggard/follower country (Portugal) in what regards to the innovation.

The analyzed evidence showed that the value of ideas is a characteristic present in the contest (cf. Table 11). Nevertheless, there are some indicators that may jeopardize this argument, such as the relationship between the number of projects and businesses created which is weak in this context.

Despite this, our conclusion is that the value is present for several reasons. The first is the fact that the value of ideas is a subjective attribute which cannot be measured effectively. Without valuable ideas, Poliempreende would not have such longevity. Secondly, we cannot argue that there is linearity between the value of ideas and the number of jobs created. In this case we should consider the external barriers that may cause difficulties to the creation of jobs. According to Naquin (2012), Portugal is one of the OECD countries with more difficulties for job creation. The bureaucracies and the fact that Portugal constitutes small market are some of the barriers to job creation. Another barrier might be the financing available to companies. In the European context, the financing of entrepreneurship is risk averse and this may cause additional difficulties.

In the case of Poliempreende, the risks of the adverse selection are present (cf. Table 11). Nevertheless, such risks are not high due two main reasons. The first is the fact that the scope of Poliempreende is restricted and this means that there is a selection

mechanism which difficult the participation of malfeasant individuals in this contest. The second reason is due to the workshops promoted by Poliemprende which allow the jury to have more information about the ideas in contest.

Despite of the adverse selection, Poliemprende has a safe market structure where the misappropriation of the ideas does not exist. Due to this, the IPRs regard essentially to the knowledge owners (cf. Table 11) and this constitutes also a positive aspect of this case study.

The scope and boundaries of Poliemprende were the only characteristics which we could evaluate through the public data because these two characteristics are well defined in the case of Poliemprende. Since the pool of knowledge owners is constituted by students and teachers from the Institutions which participate in this contest, we consider the scope of Poliemprende as closed (cf. Table 11). The boundaries of Poliemprende are external (cf. Table 11) due to the fact that this contest is managed by the Polytechnic Institutes instead of being managed by the knowledge seekers.

Table 11: Evaluation of the main characteristics of the MFI literature

Main characteristics	Presence	Evidence
Value	Exists	A good part of the ideas are value propositions to market needs according to the coordinators' opinion.
Adverse Selection	Exists	According to the coordinators' opinion, usually the competitors try to overestimate the returns that can be generated by the ideas.
Appropriability	Exists	All the IPR are owned by the knowledge owners. In some cases those Rights are shared with Knowledge Seekers and Schools.
Scope	Closed	Knowledge Owners can be the students, graduated students or teachers from the Polytechnic Institutes.
Boundaries	External	The contest is not managed by a Knowledge Seeker but managed by the Polytechnic Institutes.

Source: own elaboration

The present study not only assessed the main characteristics referred by the MFI literature but also other characteristics referred in the management literature. This allowed us to consolidate the discussion of the MFI's main characteristics.

The complementarity of ideas is a characteristic which can increase the value of the ideas but it is not present in the case of Poliempreende. Since this contest is developed by a group of academic institutions, the network effect should be used to evaluate the complementarity of ideas a thus leverage their value. Nevertheless, this is a characteristic which can take a lot of resources to develop.

The market thickness is an important characteristic for both sides of a market. A market structure with thickness gives opportunities to knowledge owners and seekers to choose with whom to negotiate. In the case of Poliempreende, such market thickness does not exist (cf. Table 12) due to the lack of knowledge seekers. The reasons behind this phenomenon can be due to difficulties for the business creation. Another reason that can be highlighted is the lack of interest by the investors. Indeed, the Portuguese market is constituted by small and medium companies with limited resources to invest in innovation processes.

Table 12: Evaluation of the secondary characteristics

Characteristics	Existence	Evidence
Complementarity	Does not exist	Most part of the coordinators do not recognize this phenomenon in Poliempreende.
Market Thickness	Does not exist	The pool of Knowledge Owners is considerable but on the Knowledge Seekers side the pool is not wide.
Lack of Congestion	Does not exist	The relation between number of projects and number of businesses created is very low.

Source: own elaboration.

While the market thickness is a characteristic that refers to the pool of agents in both sides of a given market, the congestion refers to the flow of the transaction in a given market. Considering the context of Poliempreende, the market is congested (cf. Table 12) due to the weak relation between the number of projects submitted to contest and the number of businesses created. The reasons behind this can be the existence of external barriers (e.g. bureaucracies), the lack of investors, and the motivations of the knowledge owners. Since Poliempreende is developed by academic institutions and the knowledge owners are essentially students, their main motivations might not be the job creation or selling an idea. One of the coordinators referred that in some cases, the students present interesting ideas but they do not advance with the creation of a business because their motivation is to continue with their studies/degree.

We can argue that the main characteristics discussed in the MFI literature are present in the case of Poliempreende but the absence of market thickness and the congestion lead us to the conclusion that there is not a MFI in Portugal.

The development of a MFI is a complex process because it involves several challenges. Trading ideas can be very difficult due to their specific characteristics like the IPR, the information involved and the value. Nevertheless, such challenges can be just one part of the main difficulties. The agents must consider also externalities like bureaucracies and the tolerance to the risk by the part of the agents. In the Portuguese context such externalities are the main barriers against the existence of a MFI.

The novelty of the concept of MFI was the biggest difficulty that we encountered during this study. This led to some difficulties to find in the available public data enough information to assess the characteristics of Poliempreende. Thus, it was necessary to develop a survey targeting the coordinators of this contest.

Despite our contribution there remain some future research paths worthwhile to pursue. Work is needed to understand how to develop ideas oriented to the market. The motivational drivers of the agents are another subject which requires some study within the MFI literature. The understanding of such drivers could be interesting to improve the reputation of the existing MFI. Finally, it would be interesting to study what are the main similarities and differences between Markets for Technologies (MFTs), which involve the transaction of knowledge, and MFIs.

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Appendix

Appendix A: the survey

Markets for Ideas in Portugal

Please indicate, regarding the Poliempreende's edition which you organized

What is your perception regarding:

	Weak				Strong
	1	2	3	4	5
Evaluation of the presentation of ideas.					
Matching between market need and evaluation of the ideas. <small>(Excelent: the jury allways is right on their judgment regarding if the ideas will succeeded or not in the market)</small>					
Ratio between number of businesses created and number of participants. <small>(Excelent: High number of businesses created at the end of each Poliempreende's edition)</small>					
Probability of the winning ideas to have success on market.					
Poliempreende's capacity to attract investors.					

What is your accordance/discordance degree:

	Totally disagree				Totally agree
	1	2	3	4	5
Competitors overestimate the returns of the ideas.					
Complementarity of the ideas is a characteristic which leverage the value of the ideas. <small>(Example: ideas X and are not valuable per se but if complemented constitute a good value proposition)</small>					
The ideas submitted to the contest consist in value propositions to real needs of a given market.					

Who owns the intellectual property rights of the patented ideas:

	Place an X on the option / options relevant to you:
Competitors	
Sponsor	
School	
Others (please specify):	
_____	_____
_____	_____
_____	_____
_____	_____

Appendix B: Letter for Poliemprende coordinators

Dear Mrs./Mr. coordinator from Poliempreende,

Under the Master of Economics and Management of Innovation, from the Economics College of University of Porto, under the coordination of Aurora AC Teixeira, I am doing a research project which aims to evaluate the extent to which the characteristics described in the literature about the Markets for Ideas are present in Poliempreende contest.

[A "Market for Ideas" is a market structure where supply and demand trade ideas as goods. The supply side involves agents (researchers, scientists or inventors) with a given knowledge or technology that can be transferred to other agents (investors or companies), while the demand side includes organizations / investors who want to explore new knowledge or technologies that are developed by other agents.]

To this end, it is essential to evaluate the perception of the coordinators of the different institutions which participate in the contest because Poliempreende due to the unique knowledge which hold. The attached survey is very quick to respond and, we believe, will not involve a lot of time from you.

Due to the dissertation schedules, it would be very important to receive your contribution until the 31st March 2015.

I am at your disposal for any question you may have.

I would like to thank you in advance for your collaboration.

Kindly regards,

Ricardo Martins