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Mapping inclusive innovation: A bibliometric study and literature review

Abstract

Inclusive innovation is a type of innovation that targets not only affordability but also localization of underdeveloped countries, with the aim of reducing poverty. Despite the increasing attention paid to inclusive innovation, there is no common understanding of how the inclusive innovation notion is formed among researchers and experts. This study adopts a novel approach by combining bibliometric methods of co-citation analysis and text codifying of 293 core and relevant journal articles on inclusive innovation. The results reveal that the notion of inclusive innovation has evolved in five clusters: (1) innovation as a tool for affordability, (2) innovation as a tool for inclusion, (3) building of capabilities and innovation, (4) innovation constraints associated with social empowerment, and (5) innovation as an inclusive system. Furthermore, this study proposes a conceptual model based on these clusters, and discusses the nature of how these clusters lead to the possibility for further studies on inclusive innovation.

Keywords: Inclusive innovation, Bibliometric analysis, Base of the pyramid, Social empowerment

1. Introduction

In recent years, due to the many market challenges in developing countries, the importance of offering inclusion through innovative business operations in low-income markets has been gaining attention (Santos, Basso, Kimura, & Kayo, 2014). As a result of these global challenges, and for the sake of offering solutions for reducing poverty, scholars have named several types of innovations that aim to serve less wealthy societies (Brem & Wolfram, 2014; Hasan, Lowe, & Petrovici, 2019; Prahalad & Mashelkar, 2010; Rosca, Arnold, & Bendul, 2016). Social innovations such as frugal, pro-poor, reverse, inclusive, and Gandhian innovation, to name a few, refer to innovations originating in developing nations (Brem & Wolfram, 2014; Hasan et al., 2019; Prahalad & Mashelkar, 2010; Rosca et al., 2016). However, these innovation schools mostly focus on affordability, while an inclusive innovation (ININ) is a form of innovation that was crafted to develop mechanisms for companies and other actors, so that they not only offer affordability to the needs of lower-income people but also build their capabilities, and improve their empowerment and welfare (Peerally, De Fuentes, & Figueiredo, 2018). An ININ is defined as any social innovation that aims to offer livelihood opportunities to poor people who are excluded from the market (Foster & Heeks, 2013a).

However, International organizations, such as the United Nations (UN), also emphasize the role of social innovation in the battle against grand challenges (i.e., Sustainable Development Goals (SDGs) and Millennium Development Goals (MDGs)), such as poverty reduction (Cormier, 2018). As a result, social innovations targeting to improve societal challenges are becoming a priority for policy makers' agendas, because these innovations can assist in overcoming the constraints of conventional welfare systems (Borzaga & Bodini, 2014). Government bodies such as the European Union (EU) and organizations such as the World Economic Forum (WEF) have a

strong belief in the mechanism of different types of social innovations, as they can enhance living standards in underprivileged countries (Grimm, Fox, Baines, & Albertson, 2013) and can assist in overcoming the constraints of conventional welfare systems (Borzaga & Bodini, 2014). Moreover, social innovation is the core element of the European vision integrated in the Europe 2020 strategy by the European Commission. One of the strategy's focuses is related to social exclusion, which results from mainstream technological innovation solutions (Levidow & Papaioannou, 2018). A high-cost intensive innovation tends to exclude the needs and desires of lower-income people. Other issues relate to lack of employment and existing inequalities in underdeveloped communities (European Commission, 2010).

In addition, social innovation is important not only for community empowerment but also for enhancement of the compatibility of companies in these challenging markets. Innovation is a key pillar for multinational enterprises (MNEs) in adapting to changing markets (Amit & Zott, 2001; Gopalakrishnan & Damanpour, 1997; Hurley & Hult, 1998), attaining market value and market share (Bercovitz & Mitchell, 2007; Zahra & Filatotchev, 2004), and gaining sustainable competitive advantage (Leonard-Barton, 1992; Savino, Messeni, Petruzzelli, & Albino, 2017; Zander & Kogut, 1995).

To provide more inclusive policy alternatives, policy makers have called for scholars to conduct research to understand the mechanisms for how to support inclusive growth, sustainability, and economic prosperity through innovation, which is also the core objective of inclusive innovation (Erken & Kleijn, 2013; Grimm et al., 2013). ININ is a relatively new concept in innovation that was defined by Foster and Heeks (2013a). Several other scholars (Ansari, Munir, & Gregg, 2012; George, McGahan, & Prabhu, 2012; Hall, Matos, Sheehan, & Silvestre, 2012; Halme, Lindeman, & Linna, 2012; Nijhof, Fisscher, & Looise, 2002) emphasized the notion of

ININ or made similar arguments before Foster and Heeks' (2013a) seminal work. Regardless, Foster and Heeks' (2013a) definition of ININ is often cited in current research (Pansera & Owen, 2018; Peerally et al., 2018). There are similarities between ININ and inclusive development or inclusive growth. George et al. (2012) argued that ININ is an extension of inclusive growth but called for future scholars to refine the notion. Moreover, Peerally et al. (2019) stated that the notion of inclusive development shares many similarities with ININ, although ININ may be seen as a tool for development. Scholars have investigated ININ conceptually and empirically to understand how ININs are translated within MNEs (Pansera & Owen, 2018). Similarly, research has increased the understanding of the role of government bodies in ININ (Sengupta, 2016) and the role of various operational capabilities for ININ (Peerally et al., 2018). Although research on ININ has been gaining more insights, and the concept has been recognized in different studies, the research in mapping the notion of ININ, and in explaining how this notion has been formed and the mechanism behind it, is limited. In response, the purpose of this study is to facilitate future researchers by mapping and examining the nature of ININ in existing studies, such as its building blocks, giving a deeper understanding, to observe its commonalities with or differences from other pro-poor innovations or similar notions. Therefore, we address the call for research on ININ by using bibliometric analysis mapping of current, previous, and future research directions on the topic. By using the bibliometric approach, we are able to explore the impact of the study field, which can be valuable for the increasing body of studies, and help researchers shape the future of the ININ field. In addition, the bibliometric analysis of co-citation helps us understand the clusters (the building blocks of ININ) that formed the notion of ININ. Moreover, we code each cluster from the core literature through the content classification system, which we explain in more detail in the method section. Then, we aim to identify past and present research to draw future research avenues for

more fruitful investigations of ININ. Last, we offer a conceptual model based on the findings of each cluster to help understand the phenomenon of ININ.

2. Literature review: Methodology and data

The methodological process of the paper took place in three main phases. In the first phase, we identified the relevant literature on the ININ topic with a keyword search and publication retrieval. This process was extended by using a toolkit to identify the most important “core literature.” In the second phase, we conducted a literature review of the core publications identified in the previous phase. The expert panel performed an in-depth qualitative content analysis of the selected literature to extract the main themes and the main clusters of the publications. In the third phase, we use a bibliometric analysis of the core literature to analyze the impact of the core literature and the dynamics of the dissemination of the periphery literature. The three-phase process is shown in Fig. 1.

Insert Figure 1 about here

Detecting the “core literatures” is an effective way to distinguish impactful papers in a particular domain of study and its periphery literatures. We used the core literature to identify further relevant documents, by following their strong and medium-strong links. The notion of core literature was first presented by Small (1973) in connection with co-citation analysis. The concept was expanded by Glänzel and Czerwon (1996), based on bibliographic coupling, to identify literatures from important nodes in the network of scholarly communication. In general, the focus on bibliometric analysis is on citation networks of individual publications. Cooper, Hedges, and Valentine (2009) showed that citation connections could express relevance to the topic of discussion. Therefore, if a set of records is more highly cited by other publications in a certain

domain field, then these records have a greater possibility of belonging to the same domain field. Our interpretation of “core literature” represents the most related and impactful papers in the domain of study. Meanwhile, they might not necessarily be interlinked, as the discipline might be emerging or the topic highly multidisciplinary. Then, we utilized the core literature to identify periphery literature that were often cited the core literature. The peripheral literature corresponds to the papers that cited the core literature and enabled the extending the discussion in the core literature. Fig. 2 shows representation of what “core literature” means from our perspective.

Insert Figure 2 about here

Regarding Fig. 2, we try to delineate our perception of the core literature and its features for identifying the most relevant literatures or “peripheral literature” to the core literature in a multidisciplinary field of science. Discipline A represents mostly the socioeconomic literature, while discipline B is linked to the innovation management stream.

The main intention of defining the core literature is, first, to define the central and most relevant literature about the topic, and second, to detect the periphery literature. We collected papers that cited the core literature (in this case, the periphery literature) to see the dissemination of the core literature for the particular domain of study. In the three following sections, we explain the methodological process in detail according to Fig. 1.

2.1. Literature retrieval and core literature detection

In the first phase of the literature review, we identify the relevant literature using a list of keywords, aiming to isolate the ININ research discourse through its core topics. Table 1 illustrates the keywords we used to create the search query on Thomson Reuters Web of Science (WoS).

Insert table 1 about here

Next, we apply an open-source cloud-based toolkit-assisted integrative analysis of ININ, codifying the main concepts and theories connected to ININ over the last two decades. The bibliometric data analysis was facilitated with the software toolkit for NAILS that was developed and published via the authors first presented in a conference paper in 2015 (Knutas, Hajikhani, Salminen, Ikonen, & Porras, 2015). The motivation for using NAILS was to promote its usability and availability as the only open-source cloud-based toolkit for bibliometric analysis. Despite expensive commercialization, closed system tools must be set up, and need expert knowledge in data preparation and processing, particularly for literature reviews. NAILS proposes an open, extensible tool with even more automated workflows, which will make this bibliographic analysis available to a wider part of the community of researchers. NAILS, which uses a series of custom statistical and network analysis functions, offers users an overview of literature (Pansera & Owen, 2015) data sets retrieved from WoS (<http://nailsproject.net>). The NAILS statistical and Social Network Analysis (SNA) on bibliometric data has been featured in concept emergence and dissemination (Hajikhani, 2017) and patent portfolio comparative analyses (Ranaei et al., 2016).

We downloaded the bibliometric data of the 293 records, bundled with a compression tool to upload into NAILS. As a result, we generated a custom report providing abstract and keyword analyses, productive authors and journals, and recommendations on top publications according to citation data. This resulted in a shortlist of the 37 core literature papers.

2.2. In-depth review and clustering of the core literature

In the second phase, we conducted an in-depth literature review of the core publications retrieved with NAILS. To ensure high-level transparency with maximizing replicability (Snyder, 2019), we justify every step of the content analysis method we employed with arguments. For the

sake of this study, we used Carter and Estone's (2011) content classification system plus an additional phase in which the authors produced clusters (or categories) based on the findings and focus of each article to allow for meta-level synthesizing to generate future research directions as well as offering a conceptual mode (Snyder, 2019). Therefore, we analyzed the core 33 papers out of 37 (we did not have full access to 4 of the articles online) focusing on different categorizations: 1) focus of the paper, 2) research setting, 3) industrial setting, 4) geographic context, and 5) main findings (resulting in the clusters that show the ININ building blocks). The codification and classification processes of the core articles was performed in the following manner: First, two of the first authors coded all the 33 articles (in Excel and Mendeley) individually based on the five categories. Second, the authors compared the results and settled agreement and disagreements. Third, the first two authors presented the classification (first-order codes) of all the articles to the third and fourth authors and refined the codes further. The agreement rates for the first order-codes (shown in Table 2) were, on average, above 90% which is in line with Carter and Estone's (2011) recommendation ensuring the high reliability of the codes. Last, to finalize the refinement process of the codification and classification of the core articles, the paper was presented at two workshops and one conference to gain assurance of the robustness and reliability of the clusters.

The codification of the articles resulted in five key goal-oriented discussions (formed as clusters) that framed the main themes studied by the researchers: innovation as a mechanism for affordability, innovation as an important tool for inclusion, building of capabilities and social empowerment through innovation, innovation constraints associated with social empowerment, and innovation as an inclusive system (Quarshie, Salmi, & Leuschner, 2016) in Table 1. A manual for the logic behind the coding of the articles is available (Appendix A). The content classification of each article can be found in Table 2.

2.3. Impact analysis of the core literature

In the third phase, we investigated the evolution and dissemination of the ININ concept in the broader scientific and academic debate (Glänzel, 2015). Many research fields use bibliometric methods to explore the impact of their field, a set of researchers, or a particular paper (Glänzel, 2015). We conducted the bibliometric data analysis as a means of providing a quantitative analysis of academic literature (Bornmann & Mutz, 2015) in three different ways. First, we used the bibliometric method to construct the citation graph by examining the evolving impacts of the core literature within the five discussion categories. This helped us visualize how the core literature in the five key ININ clusters (discussion streams) has increased exponentially. Second, we used the bibliometric method to show how articles in each cluster achieved shared impact. This helped us explore the impact and citations for each cluster which can help researchers to gain information on the cluster that they desire to investigate further. Last, the bibliometric method enabled us to capture the dissemination of 37 core literature works that we had identified previously. From the citation perspective, we could track the papers that cited the core literature which resulted in a total of 837 papers that we call “peripheral literature.”

We delineated the perception of the core literature by identifying the most relevant peripheral literature in a multidisciplinary field of science. In keeping with Cooper et al. (2009), we studied citation connections, to understand the relevance of ININ as a scientific topic of discussion. This step puts the core literature and peripheral literature citations into perspective, to understand the generated impact of each cohort, and gives an image of the emerging literature growth trajectories. In section 4, we expand on the citation analysis results in detail. We apply the procedures to understand how ININ has been adopted, and is evolving, in academic debates. Based on the expert evaluations of the discourse taking place in the core literature. We then conducted a detailed

analysis to distinguish the core literature, and accordingly, the periphery literature dissemination in scientific subject categories.

3. Inclusive innovation: Review of the most cited articles

Table 2 illustrates the categorization of each cluster and the papers associated with the clusters. For the sake of the bibliometric analysis, we classified every article in one particular cluster in the table of the core literature. However, in the literature review section, we go more in depth in explaining the findings of every article and saw that some of the findings from the articles could fit more than just one cluster. Thus, although in the table we clarified each article in one cluster (we decided the one cluster based on the majority of the findings), when explaining the results, we refer to some of the articles in multiple clusters, as they had more than one theme.

Insert table 2 about here

3.1. Innovation as a tool for affordability

The first cluster focused whether innovation can offer a mechanism for creating affordability in less resourceful markets in developing countries. In this cluster, several of the research papers saw innovation as a mechanism that creates frugal offerings (products and services) for poor societies. The majority of articles focused on frugal innovation as a mechanism for creating affordable offerings for people.

Research in this cluster focused greatly on the role of the MNEs present, and how they generate frugal innovation. Zeschky, Widenmayer, and Gassman (2011) defined frugal innovation as a type of innovation aimed to create good enough products that are affordable and meet the demand of consumers in resource-scarce environments (mostly in developing countries). Establishing R&D subsidiaries in resource-scarce environments provides MNEs closer access to the market and locals, and expands the MNEs' knowledge of what the market demands. This is vital for MNEs to

engage with local communities (Altmann & Engberg, 2016). Altmann and Engberg (2016) found that the R&D units in developing countries can assist greatly in achieving frugal innovation, as long as the units have knowledge about the market and the technology they wish to implement. The literature further suggested that establishing an R&D unit or different functional units in the host country, and engaging with locals, increases the probability that MNEs generate innovation, because local people can convey useful ideas. The presence of MNEs in developing countries can have incentives for developed markets in the form of reverse innovation. According to Zeschky, Winterhalter, and Gassmann (2014), reverse innovation is similar to frugal innovation, but with the difference that reverse innovation is launched ultimately in developed countries (MNEs test products or services through frugal innovation in developing countries, and then launch the offering in the developed market of their origin). The authors also emphasized that Western MNEs often lack the motivation to operate in developing countries, due to the very complex challenges. However, a combination of challenges and frugal innovation can further help in developing reverse innovation, leading to larger profitability.

In addition, Prahalad (2012) argued the importance of the so-called 4As (affordability, accessibility, awareness, and availability) in marketing and break-through innovation in successful operations in base of the pyramid (BoP) communities. Prahalad coined the notion of the 4As, replacing the 4Ps (product, place, promotion, and price) of marketing, asserting that for successful operations in poor markets nongovernment organizations (NGOs) and MNEs must understand different aspects, such as generating awareness in areas that are “media dark”—without access to TV or radio signals, low-cost approaches to rural markets, challenges related to logistics and supply chains, and reduced costs, to provide affordable goods and services. However, despite the beneficial outcomes related to frugal innovation in poor markets, some studies found negative

views on frugal innovation. For instance, Tran and Ravaud (2016) argued that, without a doubt, frugal innovation is an excellent tool for creating inclusion in resource-constrained environments, but many frugal services should be examined before being launched in the market, as some of the products developed could not be safe. In addition, Prathap (2014) claimed that although the term frugal innovation was coined in India, it is easier to foster frugal innovation for MNEs in African and South American countries compared to India. This shows that MNEs' level of experience can make them more compatible in market selection, so they are aware of the barriers to different emerging markets. However, in contrast, Ramani and Mukherjee (2014) studied technological innovation in the healthcare sector for poor communities in India and noticed several findings, suggesting that the Indian market is friendly toward frugal innovation but with the right set of networks and partnerships.

Other studies discussed the role of host country governments as a facilitator for MNEs' operations in developing countries. Hall and Lobina (2007) found that innovation fostered by MNEs, and the way they form contracts with the government sector influence on their operations in low-income communities. Additionally, it is important for the government to create an environment that attracts MNEs in terms of profitability, so that they will not exit the market. Similarly, Barclay (2014) claimed that legitimacy issues in fostering frugal innovation in developing countries are very difficult barriers to overcome. In addition, other studies focused on a general level acknowledged that frugal innovation plays a significant role not only for MNEs and governments but also for international organizations, such the UN, as frugal innovations can facilitate the SDGs (Levänen et al., 2016; Pansera & Sarkar, 2016). Using an ethnography method, Pansera and Sarkar (2016) found that technological innovation is about not only low prices and building capabilities but also collaboration between intermediaries and the government.

Moreover, the corporate social responsibility (CSR) of an organization is highly relevant to the technological innovations a firm generates. Thus, CSR must be integrated by the company and the developing host country. Innovation for poor communities necessitates a partnership (i.e., local entrepreneurs and local government institutions) so that the firm is able to adapt with technological and economic changes. Hall, Bockett, Taylor, Sivamohan, and Clark (2001) found that partnerships with different actors allow companies to foster innovation but also adapt to environmental changes.

3.2. Innovation as an important tool for inclusion

The second cluster was mapped on 10 articles that investigated innovation as a tool for inclusion. The findings of these articles suggested that innovation is an effective tool for creating inclusion for poor communities that are excluded from the market. From the articles in this cluster, it can be seen that innovations aimed at inclusion focus primarily on offering as much inclusion as possible so that the products or services are targeted not only to a portion of the market but also to the whole market. Although innovation for inclusion may share similarities with ININ, the difference is that inclusion is only a part of ININ (additional discussion is below), because an innovation for market inclusion mainly focuses on the access or availability of the goods and not primarily on social empowerment. In addition, innovation aimed at inclusion has some resemblance to with affordable innovation, but it goes beyond providing inexpensive goods, and it offers marketing inclusion solution.

According to Anderson and Markides (2007), to create market inclusion, firms operating in developing countries must adapt or implement the 4As (accessibility, affordability, awareness and acceptability) framework of marketing (first coined by Prahalad) to generate strategic innovation solutions (innovative strategies for offering solutions that fit the market needs). However, the

authors also asserted that companies can operate in BoP markets in the same way as in developed markets: by finding potential gaps in the market and filling them. Similarly, Anderson and Markides (2007) stated that firms that operate in BoP markets do not need to worry about finding customers as they already exist, but firms should focus on how to adopt to the 4As to create this inclusion in the market. The results highlighted that the 4As is not only a method applied by companies to yield affordability (as stated for the previous cluster) but can also result in more market inclusion, through adaptation of products or services to the market.

Another empirical study (Hall et al., 2012) found direct links in emerging economies with local innovation and social inclusion. Hall et al. (2012) asserted that local innovation (innovation that is generated by the local people in the country) fostered by social entrepreneurs in the tourism sector will result in social inclusion, as the locals come up with new ways of facilitating tourism needs in their country more easily than the tourism agencies in Western countries.

Several articles in this cluster highlighted that frugal innovation can lead to sustainable economic and social inclusion for MNEs. However, for frugal innovation to result in effective market gains, inclusion must be facilitated through overcoming several inequalities, such as gender discrimination, as well as differences between MNEs' high-priced offerings and low-income communities, which, at this point, cannot be handled with frugal innovation alone (Knorringa, Peša, Leliveld, & Van Beers, 2016). Frugal innovation is important for inclusion, because it seeks to offer affordability to the excluded market, but frugal innovation may not be effective in addressing sustainability challenges, such as the SDGs, in the long run. Levänen et al. (2016) claimed that although frugal innovation addresses several goals in the UN's SDG framework, this type of innovation falls short of overcoming sustainability issues, such as inclusive employment, sustainable local industrialization, and generation of material efficiency into products and services.

The authors investigated basic services, such as water and the energy industry, and discovered several shortcomings in sustainability measures, such as high prices and low impacts on health and education. Some scholars simply indicated innovation for inclusion as a bundle of four dimensions: people, activities, outcomes, and governance (Schillo & Robinson, 2017). However, others suggested social inclusion as a byproduct of civil society, which needs to carry out new urban governance measures (Squire et al., 2011).

Social entrepreneurship alone can be an effective measure for inclusion, because local entrepreneurs generate interesting innovations that offer inclusion. An empirical study found that innovation in sanitation entrepreneurship in India was successful in the diffusion of many toilets in rural areas and poor communities (Ramani, SadreGhazi, & Duysters, 2012). This research highlighted three important factors that differentiate pro-poor innovation from traditional innovation. These factors are introduced as an iterative process in BoP markets which refer to focusing beyond the market, finding right partnership with other organizations and building capabilities and targeting (Ramani et al., 2012).

3.3. Building capabilities and social empowerment through innovation

The third cluster includes articles that drew conclusions on how innovation can result in affordability of inclusion but also generate social empowerment through building capabilities. These studies evolved the role of MNEs, the particular industry, and the role of locals in the countries. Zeschky et al. (2014) claimed that for MNEs aiming to have a successful frugal or reverse innovation, it is essential to establish subsidiaries, such as R&D units, in developing countries or countries in resource-scarce settings, as locals can generate innovative ideas easier than non-locals from developed countries. This act will result automatically in job creation and knowledge sharing, which leads to social empowerment by MNEs in poor countries. Although the

role of MNEs was seen to be positively linked with local prosperity, some articles seemed to link industries, such as tourism and the energy sector, as enablers for social empowerment. Hall et al. (2012) found that the tourism industry in Brazil can help facilitate social empowerment, and build capability for BoP communities mostly through local innovation and local entrepreneurship. Similarly, Nocera (2012) found that there is a clear pattern between supplying energy, such as electricity, to poor communities and the social growth and prosperity of these societies. Moreover, the same study contended that communities that have access to energy are wealthier and more educated, and tend to have fewer children. The authors proposed that industries that lead to regional growth, such as tourism and energy, would result in more opportunities for innovative business ideas, as well as social empowerment.

In the Indian context, it was revealed that successful innovation diffusion and inclusion can be attained by improving the livelihood opportunities and localization through networking (networking with key actors in the market) in poor communities (Ramani & Mukherjee, 2014). Other scholars viewed poverty as related to regional innovation capacity. Agrawal, Kapur, McHale, and Oettl (2011) found that the innovation capacity of a region is directly linked to the level of poverty alleviation and social empowerment. Their study showed that the brain drain causes huge losses for these developing nations. However, Agrawal et al. (2011) also emphasized that the brain drain can be beneficial for the remaining innovation within the developing country, as these countries can get connected to valuable knowledge from the brain bank abroad.

3.4. Innovation constraints associated with social empowerment

Innovation constraints play a major role in the process of fostering ININ. Several highly cited articles focused on innovation constraints and ways to overcome these constraints in scarce resource contexts. The articles in this cluster mostly investigated external (i.e., environmental

challenges, such as government institutions and infrastructure) and internal (i.e., production process, management decision, and strategy choices at the firm level) constraints related to innovation and resources, and how to remove these constraints through various scopes in poor countries.

To foster frugal, cost, reverse, and other social innovations, companies must understand the constraints related to these markets, as such knowledge directly facilitates market expansion. Scholars found that companies that aim to focus on cost innovation (innovations that focus on reducing costs) can overcome resource constraints more efficiently compared to companies that focus on creating a new market with only frugal innovations (Zeschky et al., 2014). A very useful solution for overcoming some of the constraints in poor markets is the notion of *jugaad* innovation. This concept is arguably well-established in social innovation literature. However, the difference between *jugaad* innovation and frugal, reverse, inclusive, and Gandhian innovations is that a *jugaad* innovation emphasizes attaining innovation with the least amount of resources (Prabhu & Jain, 2015). This means that an MNE does not need to focus primarily on making the product affordable but can have a holistic view on what raw materials and resources are available before producing the goods.

Regarding overcoming innovation constraints, the so-called intrapreneurial bricolage (an entrepreneurial activity performed by MNEs that can help large organizations offer bundles of scarce resources and show innovators how they can overcome resource constraints by mobilizing internal and external resources) can be an effective tool that helps companies overcome internal and external innovation constraints (Halme, Lindeman, & Linna, 2012). The authors elaborated that short-term profit maximization, uncertainty avoidance, shortage of time for performing duties, and lack of funds and access to experts are common constraints MNEs face in resource-scarce

environments. To overcome these constraints, devoted individuals who volunteer to assist poor communities can utilize whatever scarce resources are accessible (i.e., their free time, private-life roles and networks, or previously discarded technologies) to endorse ININ. Moreover, Halme et al. (2012) concluded that MNE middle-manager innovators can overcome innovation constraints by acting like entrepreneurs in their organizations and bundle resources creatively to foster ININ (this act is called intrapreneurial bricolage).

Some scholars saw the external environment of the hosting country as acting as an innovation constraint. The institutional void (i.e., weak institutional settings, lack of infrastructure, and lack of technological capabilities) was seen as an innovation constraint in BoP markets. However, scholars noted that such constraints can be lifted through social embeddedness (getting the help of local communities and localization; Pansera & Owen, 2015). Social embeddedness by MNEs can help companies offer microfinancing and market-based approaches with the aid of local actors.

Another study suggested simply that innovation constraints in developing countries lack scholarly investigation, and the development of knowledge about product innovation in the resource-scarce setting is lagging (Cunha, Rego, Oliveira, Rosado, & Habib, 2014). The authors also suggested that companies must learn not to avoid tackling innovation barriers and view constraints as a process, rather than uncharted territory.

Scholars also investigated the role of constraints in inclusiveness, and how to lift these barriers with the right innovation strategies. To help remove inclusiveness constraints, companies and NGOs must foster innovative strategies that offer market orientation, as well as financial self-sustainability for poor markets (Mendoza & Thelen, 2008). Likewise, another study revealed that financial constraints limit the capability of domestically owned enterprises to innovate and export, leading to slower technological frontiers (Gorodnichenko & Schnitzer, 2013).

3.5. Innovation as an inclusive system

In the fifth cluster, the majority of articles focused on ININ from various perspectives. The most cited article of the data set was an editorial from a special issue of *Journal of Management Studies* concerning poverty and social development (George, Mcgahan, & Prabhu, 2012). Although the focus of the editorial was to summarize all the papers in the special issue on inclusive growth, George et al. (2012) discussed the ININ phenomenon and called on scholars to start researching this concept on empirical and theoretical grounds. The editorial also emphasized several methodological and theoretical tools that future scholars could utilize for exploring ININ.

One of the most cited definitions of ININ is from Foster and Heeks' (2013a) work. They conceptualized ININ through the case study approach (conducting a study on the role of scalability and innovation in the Kenyan information and communications technology [ICT] sector) and defined inclusive innovation as a type of innovation that aims to create inclusivity of poor markets that have been excluded from the marketing process of companies (Foster & Heeks, 2013a). According to Foster and Heeks (2013b), ININ is seen as a system that replaces conventional systems of innovation, with the aim of focusing on innovation as an inclusive system that offers products and services to communities by involving them in the process, offering poor communities the capability to absorb the innovation, and finally, having an impact on generating livelihood opportunities for poor communities.

Financial matters related to ININ are highly complex. A study found that to overcome the financial complexities related to ININ, in addition to traditional banking systems, inclusive business incubation (incubators can offer financial help in addition to non-financial funding, such as constructing and testing a prototype, conducting market research, and putting together a practical business plan, to charm extra funding or to commercialize an innovation to put it on the

market) and micro-venture capital (organizations that capitalize more recognized, and occasionally already incubated, ventures, which demands extra considerable financial care and less hands-on non-financial care) are innovations that can facilitate ININ (Sonne, 2012).

Among the articles on ININ, two focused primarily on the role of ININ in Western countries, such as the United Kingdom (UK) and the Netherlands. A study conducted in the UK housing market found that fostering ININ through an inclusive design could help reduce the costs and offer better housing, which is good for the elderly and people with disabilities (Milner & Madigan, 2004). A study conducted in the Netherlands showed that water supplier firms in Netherland tend to rely on consumer perspectives and sustainability concerns. Providers are inclined to subscribe to the notion that a general change from supply-side rationale to consumer-ININ strategies can be seen in the Dutch water supply sector (Hegger, Spaargaren, van Vliet, & Frijns, 2011).

4. Bibliometric analysis

4.1. Time-evolving impact

Since 2002, the academic discussion on ININ has influenced the growing volume of ININ research. ININ literature has grown considerably, and quickly, since 2011. By studying the literature on ININ, we detected the core literature, and accordingly, the peripheral literature. We examined the time-evolving impacts of the core literature within the five discussion categories detailed above and show how it has expanded over time (see Fig. 3).

Insert Figure 3 about here

Fig. 3 clearly indicates that the total number of citations received by the core literature in the five key ININ clusters (discussion streams) have grown exponentially, featuring a sharp increase between 2011 and 2014. Fig. 3 shows that Cluster 1 (innovation as a tool for affordability) and Cluster 2 (innovation as a tool for inclusion) received the most citations per article, in contrast to

the other clusters. From this analysis, it is evident that Cluster 1 (affordability) has been the center of attention and has been discussed since 2002. The notion of frugal innovation is mostly built on affordability, but so is ININ. Cluster 5 (innovation as an inclusive system) has been discussed since 2006 and has received mid-range attention compared to the other clusters. However, Cluster 2 showcased inclusion as a key factor next to affordability, and thus, has received much attention to complement the notion of ININ. Cluster 3 illustrates that less attention has been given to building capabilities and social empowerment. Although capabilities building, and localization, is the core essence of ININ, research on capability-building emerged in the core literature since 2011; articles referred to the term ININ directly since 2006. Similarly, research on the importance of innovation constraints is fragmented, as attention to constraints has grown since 2010. Fig. 4 illustrates the share of the impact among the five themes of the core discussion streams.

Insert Figure 4 about here

This research showed how papers on the II_ITI and II_IMA themes achieved a 31% and 30% impact based on citations, respectively. Regarding the five main ININ discussions, the II_IC and II_EII discussions drove 16% and 15% of the impact and dissemination, respectively. The remaining 8% impact was derived by II_BCSE.

Insert Figure 5 about here

Fig. 5 indicates the number of publications in the core and peripheral literature over time. Because there were core literature discussions as identified by experts (31 papers), we were able to extract papers that cited the core literature, referring to them as peripheral (almost 1400 papers). The results clearly indicated that the major discussions on ININ in the core literature

category emerged during the past eight years, with a significant increase since 2011. The periphery literature has also been inspired, with a significant increase in publications since 2011.

The analysis performed to generate the data shown in Fig. 5 showed strong exponential growth in the continuation of scientific discourse and the core notions debated in the five ININ clusters. Despite relying on the overall volume of publications on the topic of ININ, we first captured the core discussions in ININ and saw how the core discussions were referred to by later papers.

4.2. Fields of research dissemination

We also measured the impact and influence of ININ through its dissemination in other fields. We calculated the accumulated citations of each article in the core and peripheral literature, and tabulated them for the subject categories. Fig. 6 represents the impact of the categories studied in the core and peripheral literatures by citation points. Although there is an obvious overlap of the subject categories among the core and peripheral literatures, there has been a shift in the subject categories.

The peripheral literature showed a significant appreciation for new subjects, such as “Business studies, Management” and “Finance, Multidisciplinary Sciences.” Although topics such as “Business,” “Engineering,” and “Development, Urban studies” in the core literature were highly cited, the peripheral literature has not received the same attention citation-wise yet. However, for subject categories such as “Green and Sustainable Science and Technology,” “Environmental Studies, Water Resources,” “Geography and Area Studies,” and “Agriculture Economics and Policy,” the peripheral literature showed an increase in appreciation via citation points, compared to the core literature. Meanwhile, the peripheral literature has spread the notions of ININ to areas such as computer science, ethics, food sciences, and regional urban planning; a fact also recognized by the number of citations.

Insert Figure 6 about here

Fig. 7 shows the frequency of the most popular publication venues (the number of times the venue publishes a paper) and popular ones (sorted by the number of received citations) for the ININ core literature.

Insert Figure 7 about here

The most popular journals for the core literature include *Journal of Management Studies*, *Technological Forecasting and Social Change*, *Sustainability*, *Research-Technology Management*, and *Journal of Product Innovation Management*. Considering the peripheral literature, which extends the initial core literature, we examined all host publishing venues of the core and periphery literatures. This journal landscape was generated by considering bibliographic coupling between journals related to the field of ININ. In this map, journals that reference multiple common third journals in their bibliographies (list of references) are connected to each other. As can be seen, the colors of the map, assigned automatically, show two different collections of journals that have high bibliographic coupling. Fig. 8 and Fig. 9 were generated by inputting the raw data in the VOSviewer application for visualization.

Insert Figure 8 about here

Insert Figure 9 about here

5. Discussion

One of the main benefits of a bibliometric review is the ability to draw conclusions about future research directions by performing citation statistical analysis of previous and current research (Rey-Martí, Ribeiro-Soriano, & Palacios-Marqués, 2016; Vallaster, Kraus, Merigó Lindahl, & Nielsen, 2019). Based on identifying the core literature, using bibliometric tools and an in-depth review of the core literature, the outcome was detection of five different streams (“clusters”). We can argue that these five clusters serve as the building blocks of ININ, which was further mapped through bibliometric analysis to visualize the impact of the core literature and the dynamics of the dissemination of the periphery literature. In Table 1, we identified these streams as clusters that have enabled the development of the ININ notion.

The five clusters developed through the bibliometric analysis led to several recommendations for scholars who wish to extend the literature on ININ or other similar schools. In each cluster, we managed to understand what has been studied most and what areas can benefit from further investigation by scholars. In the next sections, we discuss the evolution, terms that frame each cluster, and possible future research investigations.

5.1. Innovation as a tool for affordability

The bibliometric analysis showed that this cluster has been the center of attention since 2002, based on the key study by Hall et al. (2001) which discussed the ways firms need to collaborate with other actors in poor communities to foster innovation. In this cluster, most of the researchers focused on ways to adapt with technological and economic changes in poor markets. Several articles focused on the presence of MNEs in developing countries (Altmann & Engberg, 2016; Zeschky et al., 2011). The presence of MNEs refers to the activities of R&D subsidiaries and other functions to achieve affordable innovation, such as frugal innovation. Literature in this cluster discussed the importance of engaging R&D subsidiaries in local countries to fulfill market demand

(Altmann & Engberg, 2016). However, the presence of MNEs in local countries is not sufficient to generate innovation. MNEs must collaborate with different actors in local countries to overcome barriers (Barclay, 2014; Hall & Lobina, 2007; Levänen et al., 2016; Pansera et al., 2016). If MNEs consider the other actors as partners to collaborate with on different issues, they could operate much more efficiently in low-income communities. A host country's government has been considered a key actor that MNEs must collaborate closely with, to address legitimacy issues (Hall & Lobina, 2007). Working with different actors in countries with emerging economies might increase the level of their experience, which can make them more compatible in the affordability of innovation in other developing countries. In addition, the bibliometric method showed the popularity of this stream among researchers which highlighted the role of decision making from an entrepreneurial scope in less wealthy societies (Saebi, Foss, & Linder, 2019). Authors of most of the studies published since 2002 have focused on the role of MNE subsidiaries in developing countries in terms of presence, partnership, and experience in achieving affordable innovations (Prathap, 2014). Thus, it is recommended that both International Business and frugal innovation scholars investigate the role of MNE decision-making processes in the MNEs' home countries, aiming to ascertain how MNEs affect the frugality and innovation abilities of branches in hosting countries. Thus, researchers are encouraged to investigate how the managerial decision making of MNEs in developed countries affects the process of frugal innovation in developing countries.

5.2. Innovation as an important tool for inclusion

The core literature studies suggested that innovation can facilitate the process of inclusion, resulting in larger markets for MNEs and local entrepreneurs, because company offerings can be available to a larger portion of the market. The bibliometric analysis showed this cluster received attention in the key study by Anderson and Markides (2007), which introduced the aspect of

achieving innovation through adaptation of the 4As of marketing, which can foster strategic innovation. Application of the 4As method by MNEs to yield affordability is not sufficient and adapting 4As is essential. In addition, social inclusion is needed to facilitate inclusion and overcome inequalities. Based on the results of the bibliometric analysis, Hall et al.'s (2012) study was another key study that grew this cluster exponentially. Hall et al. (2012) complemented the notion of social inclusion by introducing the role of local entrepreneurs as important actors for creating social inclusion, as they come up with new ideas based on local market demand. However, there is a need for collaboration among MNEs, policy makers, and entrepreneurs to control inequalities that might be created by local entrepreneurs (Knorringa et al., 2016). Social entrepreneurship alone is not an effective measure for inclusion, because these entrepreneurs must generate innovations that can offer inclusion. In addition, the bibliometric analysis showed most of the findings within this cluster have been discussed only during the last decade, but the cluster has grown exponentially compared to other streams. Specifically, recently scholars have studied the role of senior managers of MNEs in the adoption of the 4As, tailoring pricing solutions and strategic innovations for low-income communities to gain inclusion (Anderson & Markides, 2007; Knorringa et al., 2016). Others focused on the positive and negative effects of social entrepreneurship on achieving social inclusion (Hall et al., 2012; Ramani et al., 2012). However, despite the interesting findings within this cluster, we identified several research avenues that have yet to be pursued. Thus, we suggest that local entrepreneurship and MNEs are important actors that can obtain inclusiveness through innovations tailored to low-income communities. Authors of further studies in the domain of social inclusion, international business and social entrepreneurship can extend these findings, and need to explore in-depth collaboration among MNEs, entrepreneurs, and local actors aimed at overcoming inequalities. Moreover, studies did not justify clearly how

the notion of inclusion is measured, which can be investigated in more depth. In addition, scholars can advance the literature on innovation for inclusion by investigating how the process of joint innovation collaboration (e.g., MNEs and entrepreneurs) with local actors is linked to the facilitation of inclusion in BoP communities.

5.3. Building capabilities and social empowerment through innovation

In the third cluster, scholars focused on innovation not only for affordability but also for the generation of localization through methods and building capabilities. The bibliometric analysis revealed that this cluster has received less attention among researchers compared to other clusters, but the work of Altmann and Engberg (2016) is the most impactful article in the cluster that built on the notion of social entrepreneurship for localization (the behavior of this cluster is also evident in Fig. 3 and Fig. 4). The majority of articles focused on formal-sector MNEs and entrepreneurship when investigating the role of innovation in capability building in developing countries. The presence of R&D units of MNEs in developing countries can lead to social entrepreneurship through different approaches (Altmann & Engberg, 2016; Zeschky et al., 2011): One is by participating and sharing knowledge in activities based on market needs. Another is motivating local actors to create new ideas, to become possible suppliers or partners (Hall et al., 2012; Nocera, 2012). Based on some studies, social entrepreneurship can be a good reason for increasing local innovation capability; when there are support and investment, the brain drain is decreased, and social empowerment and capability building can be established (Agrawal et al., 2011). Other studies in this cluster identified a clear pattern among innovation capacity, social growth, and prosperity. The authors of these studies argued that communities that invest in social entrepreneurship can achieve regional growth in the long term, leading to more opportunities in terms of education, and improving livelihood opportunities (Nocera, 2012). These studies found

fruitful findings related to the formal sector but did not neglect the role of informal sectors in developing countries. Informal sectors (i.e., informal economies) account for a large portion of the market in developing countries, especially in Africa and Asia (Sutter, Bruton, & Chen, 2019). Thus, understanding the role of informal sectors in social empowerment, and how locals develop innovative notions to help build communities would be a robust future research exercise.

5.4. Innovation constraints associated with social empowerment

In the fourth cluster, scholars noted the challenges that can have negative results for innovation and inclusion by MNEs and entrepreneurs operating in developing countries. In addition, innovation constraints and solutions for overcoming these innovation constraints were the focus. Some studies focused on cost constraints associated with innovation. The work of Halme et al. (2012) was the most cited article in this cluster as it highlighted the many challenges of the notion of bricolage in local entrepreneurship and is seen as a discussion-leading paper on the notion of innovation constraints for inclusive business.

Studies in this cluster also found that MNEs that focus on cost innovation can overcome resource constraints much better than those that focus on frugal innovation (Zeschky et al., 2014). Such studies have been consistent with the concept of *jugaad*, which focuses on making affordable innovation with available products and resources before products and goods (Prabhu & Jain, 2015). Another innovation constraint discussed in some studies is institutional void (Pansera & Owen, 2015); a lack of institutional setting, infrastructure, and capabilities creates challenges for MNEs in introducing ININ, especially on the BoP market. Thus, these scholars argued that by using local communities, MNEs can lift some of the institutional void. In addition, we found that a combination of cost constraints and a lack of instructional settings creates another constraint for MNEs, which calls for a lack of motivation to enter uncharted territory. Some studies have argued

that MNEs must learn to view constraints as a process and enter uncharted territory (Cunha et al., 2014). Most studies in this cluster pointed to one possible approach for overcoming these constraints in the process perspective: Middle managers in MNEs act as entrepreneurs and use local individuals creatively to overcome the resource scarcity (Halme et al., 2012).

Overall, according to the bibliometric analysis, the studies in this cluster were published during the last decade and discussed the importance of working and collaborating with external actors. However, mechanisms that aim to overcome institutional constraints, leading to more inclusion in resource-scarce markets, have not been investigated. Thus, researchers can extend this work by investigating the constraints caused by institutional voids that affect the innovation capabilities of the organizations aimed at social growth in poor markets.

5.5. Innovation as an inclusive system

The fifth cluster of the core literature focused on ININ and argued that ININ is a system that must replace a traditional conventional system, to increase social empowerment in poor countries. The results of bibliometric analysis show that although discussions around this cluster started in 2006, the notion importance came to attention only recently. Thus, the number of articles that focused primarily on ININ was not significant (in the core literature). In fact, the paper by George et al. (2012) which called for further research on a framework for ININ for inclusive growth made a significant contribution to the innovation as an inclusive system discourse. ININ offers a way to include excluded markets due to resource scarcity and tough environmental settings. According to Foster and Heeks (2013b), ININ refers to a system that provides products and services to poor communities by involving them in the process. ININ as a system aims to increase innovation capability and increase capacity in generating livelihood opportunities for poor communities. According to the bibliometric analysis, studies that review the core literature on ININ were

conducted during the last five years, but the number increased significantly. This increase signifies the attention of this stream that considers inclusion as a way to reduce poverty, which will ultimately result in social growth in low-income communities. However, important articles (from the core literature), thus far, have studied ININ in developing countries in Africa and Asia, mostly focusing on conceptualization and definition in financial and technological industries in BoP markets (Foster & Heeks, 2013a; Sonne, 2012). Thus, these studies can be advanced in International Business domain by researchers wishing to investigate ININ from an internationalization perspective. Although some studies within the cluster investigated ININ, they mostly referred to community-level findings and did not explore the hurdles that MNEs of developed countries have to go through to gain insider-ship in the BoP market and obtain the needed network of partners in another foreign market (Vahlne & Johanson, 2020). Thus, future studies can investigate how the process of internationalization of MNE from developed countries can alter the impact of ININ and community empowerment of a BoP market.

6. Conclusion

The main purpose of this study was to map the notion of ININ by using a bibliometric literature review to understand how this notion may have been formed. Although scholars are making successful efforts in understanding ININ, this study aimed to advance ININ by offering not only potential future research avenues but also a conceptual model that can be examined later. Thus, by providing a conceptual model of ININ, including different clusters, we demonstrate that ININ is a representation of combined clusters, which can be utilized for defining the main conditions for different types of social innovation. In particular, the summary of combined clusters (shows in Fig. 10) shows that ININ is a mechanism that can function well only when all clusters are operating effectively. For example, the *affordability* cluster indicates that firms need to engage at the

grassroots level to understand the market. Further, the *inclusion* cluster pertains to the innovation strategies for adapting to the market inequalities and understanding the market needs. The *social empowerment* cluster highlights the need for supporting the local entrepreneurs as well as enhancing the innovation capability of the local communities. Moreover, the *innovation constraints* cluster implies that international companies may lack motivation to invest in developing countries due to the institutional void (i.e. weak infrastructure and lack of resources) in the market resulting in lower profits for the companies. The last cluster—*innovation as inclusive system*—highlights that locals need to be engaged in innovation initiatives, but also require financial support to enhance their purchasing power.

Further, the cluster account for ININ draw attention to the two main streams of literature namely innovation management and socioeconomic. The five clusters not only helped us understand the findings of previous and current research but also facilitated future work by producing several research avenues. The five clusters framed in this study lead to the possibility for further research to investigate the notion of ININ in different ways.

First, early-stage researchers in this area can gain benefits from the bibliometric analysis presented here to understand the time-evolving impacts of the core literature in their field, the impact and citations received for each cluster, and the dissemination of the core literature in each cluster. In addition, as these five clusters stem primarily from the socioeconomic and innovation management streams, researchers can use them to identify the streams of innovation management and socioeconomic literature in which topics related to ININ are primarily discussed.

Second, the elements of each cluster (shown in Fig. 10) reveal the dynamic nature of how these clusters link to ININ by offering a mechanism that results in ININ. Grounded on the findings from the clusters we can describe ININ and say that, ININ is a type of innovation that functions as a

mechanism based on the five clusters (Fig. 10) that can offer inclusive growth and development. For instance, we propose that innovation as tool for affordability must consider different elements, such as the presence of MNEs, partnerships with local actors, and their experience, to be affordable. The bibliometric analysis showed that affordability in ININ has received more attention than other topics and has been highly cited per article. In addition, we discussed how different tools, such as facilitation, adaptation, and iteration, must be applied to gain inclusion. Although inclusion has been discussed later than the affordability in literature, inclusion has been received much attention. In addition, we discussed how an ININ system can help develop social empowerment, through increasing innovation capacity, growth, and social entrepreneurship. However, the results show that capability building, and localization requires more attention, as this topic emerged in the core literature since 2011, while articles have referred to the term ININ directly since 2006. Finally, addressing the constraints on an ININ system is necessary, through managing cost, strengthening the institutional void, and increasing willingness. However, research on the importance of innovation constraints also requires more attention, as discussion on constraints has grown since 2010.

Insert Figure 10 about here

The ININ mechanism presented here can also have several practical implications for policy makers and practitioners, for example, UN and World Bank can adopt ININ framework to offer a more refined advice to companies on how to address the grand challenges outlined in the sustainable development goals (SDGs) (Cormier, 2018). We believe that policy makers who shape the innovation narrative around inclusion will reap major benefits and induce dynamics that will help achieve the grand challenges. More specifically, the five clusters presented in our work can be used by the managers to implement the ININ mechanism, as shown in Figure 10. In the first

cluster, it is apparent that market presence, adequate experience and strong partnership are essential for determining the market supply and demand and thus product affordability. As localization is at the core of ININ, it necessitates social empowerment, which should be achieved by supporting the local entrepreneurs and offering trainings needed to enhance the innovation capacity of the region. As this can also be seen as one of the entry barriers, many international companies are reluctant to invest in the developing markets. They also often encounter inadequate infrastructure and uncertain regulatory settings which may generate more expense for the firms. Thus, practitioners should consider adopting an inclusive system for supporting the locals, which should include offering loan packages and financial aid.

Like any other research, this study has several limitations. The findings of the clusters were based on the most cited articles, which totaled 33. There were interesting findings that we did not primarily focus on which are not in the core literature (we retrieved a total of 293 articles on ININ). Moreover, this study did not filter articles based on high-impact journals, which might have questioned some of the findings. Last, the citation of each article can change with time, meaning that the core literature that was analyzed could be subject to change in the future.

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Tables and figures

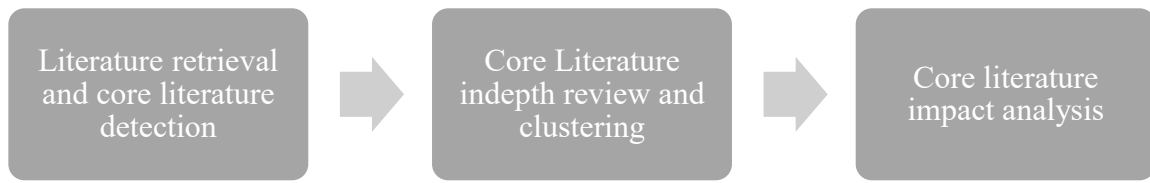


Fig. 1. Methodological process.

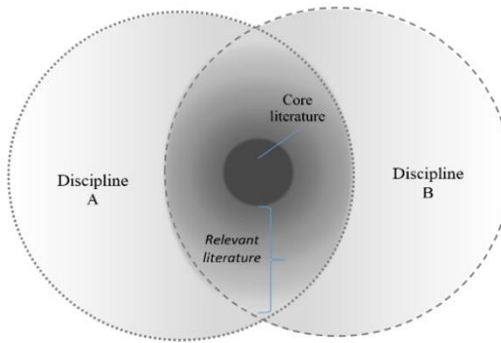


Fig. 2. Visualization of the core literature.

Table 1

The Web of Science search query.

	Search query	Results
1	TI= ("poor" OR "needy" OR "impoverish*" OR "unfortunate" OR "BOP" OR "base of the pyramid" OR "bottom of the pyramid" OR "underprivileg*" OR "insolvent" OR "disadvantag*" OR "insolvent" OR "empoverment" OR "jugaad" OR "gandhian" OR "frugal" OR "inclusive" OR "grass root"))	75,515
2	TI= innovation	71,525

Table 2 Clusters produced from the core literature.

Clusters	Sources	Method	Industry setting	Geographic context	Summary of innovation elements
Innovation as a tool for affordability	Zeschky, Widenmayer, & Gassmann, 2011	Survey based	Consumer goods	Asia	MNE presence in the region, level of experience of the organization in the market as well as effective partnership in the market are elements that offer affordable innovation drawn from the articles of this cluster.
	Prahalad, 2012	Others	Consumer goods	Asia	
	Zeschky, Widenmayer, & Gassmann, 2014	Literature review	Consumer goods	Asia	
	Prathap, 2014	Others	Not specified	Multiple	
	Tran & Ravaud, 2016	Other	Services	Not specific	
	Pansera & Sarkar, 2016	Case study	Services	Asia	
	Barclay, 2014	Conceptual	Not specified	Asia	
	Altmann & Engberg, 2016	Case study	Consumer goods	Multiple	
	Hall, Bockett, Taylor, Sivamohan, & Clark, 2001	Case study	Not specified	Asia	
	Hall & Lobina, 2007	Case study	Consumer goods	Multiple	
Innovation as an important tool for inclusion	Anderson & Markides, 2007	Others	Multiple	Multiple	Inclusion can be achieved through using market adaptation strategies, as facilitators to overcome market inequalities, and lastly, offering an iterative process to understand the market supply and demand.
	Hall et al., 2012	Case study	Transportation and logistics	Latin America	
	Knorringa, Peša, Leliveld, & Van Beers, 2016	Others	Not specified	Not specified	
	Levänen et al., 2016	Literature review	Multiple	Not specified	
	Ramani, SadreGhazi, & Duysters, 2012	Case study	Consumer goods	Asia	
	Schillo, Robinson, & Sainte-Marie, 2017	Literature review	Not specified	Not specified	
	Squire et al., 2011	Conceptual	Public administration	Not specified	
Building capabilities and social empowerment	Nocera, 2012	Others	Services	Not specified	Building capability is fostered through community
	Ramani & Mukherjee, 2014	Case study	Services	Asia	

through innovation	Agrawal, Kapur, McHale, & Oettl, 2011	Others	Not specified	Asia	growth plans, supporting local entrepreneurs and increasing the innovation capacity of the region.
Innovation constraints associated with social empowerment	Halme, Lindeman, & Linna, 2012	Case study	Services	Asia	Innovation constraints mostly evolve around financial restraints, institutional voids, and lack of willingness and motivation of MNEs to operate in developing countries.
	Cunha, Rego, Oliveira, Rosado, & Habib, 2014	Literature review	Not specified	Not specified	
	Pansera & Owen, 2015	Case study	Not specified	Asia	
	Prabhu & Jain, 2015	Others	Not specified	Asia	
	Mendoza & Thelen, 2008	Conceptual	Not specified	Not specified	
	Gorodnichenko & Schnitzer, 2013	Others	Not specified	Not specified	
Innovation as an inclusive system	George, Mcgahan, & Prabhu, 2012	Others	Not specified	Not specified	Innovation is made through engaging the locals in the process to generate localization. However, financial support packages are needed to aid the locals.
	Foster & Heeks, 2013a	Case study	Services	Africa	
	Sonne, 2012	Case study	Services	Asia	
	Foster & Heeks, 2013b	Case study	Services	Africa	
	Hegger, Spaargaren, van Vliet, & Frijns, 2011	Case study	Services	Europe	
	Milner & Madigan, 2004	Others	Consumer goods	Europe	

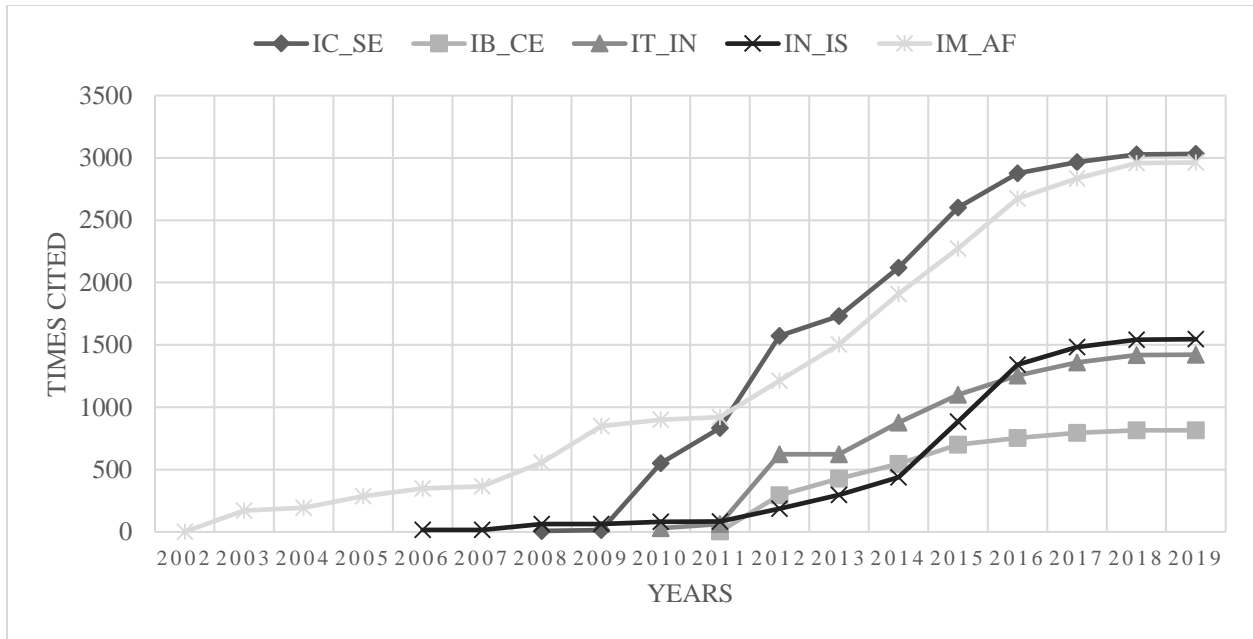


Fig. 3. Core literature citations received for the five key inclusive innovation discussions over time.

Abbreviations: IM_AF, innovation as a tool for affordability; IC_SE, innovation as important tool for inclusion; IN_IS, inclusive innovation as innovation system; IT_IN, innovation constraints associated with social empowerment; IB_CE, building capabilities and social empowerment through innovation

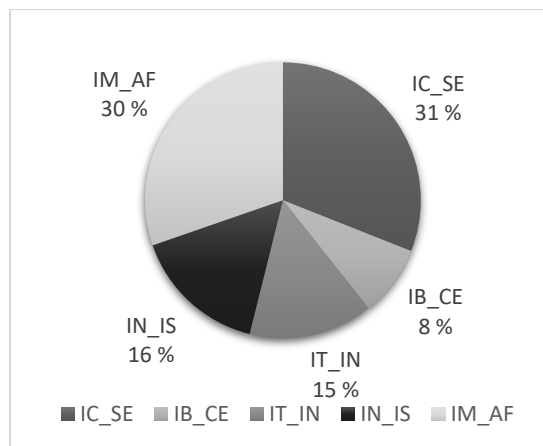


Fig. 4. Impact share of the five themes on ININ research.

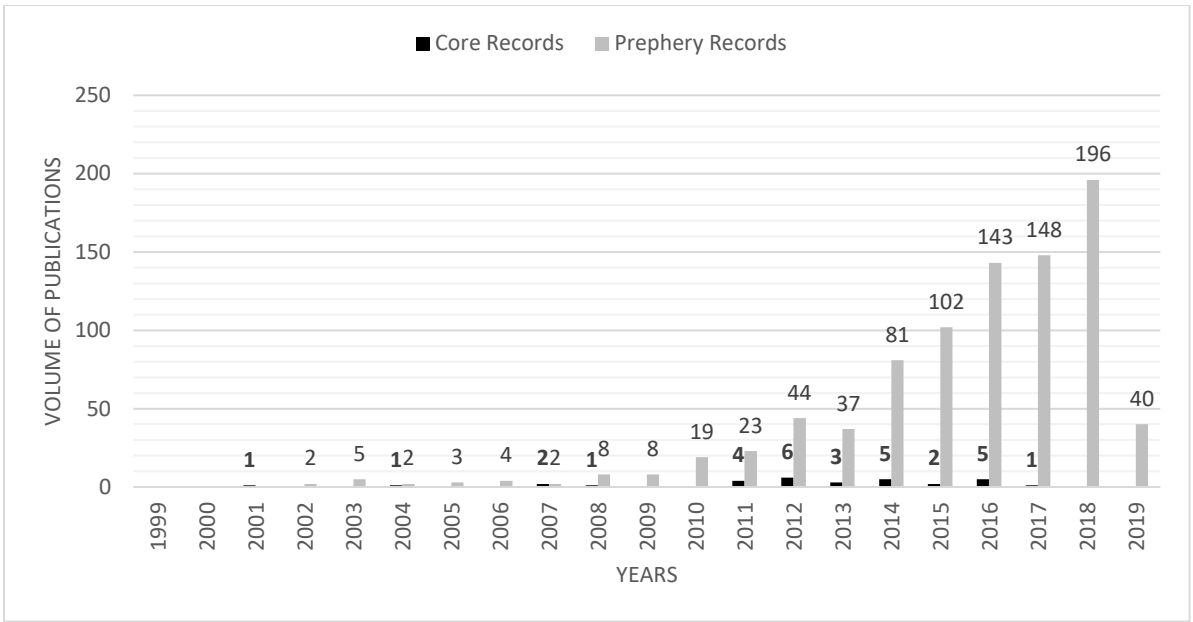


Fig. 5. Time series for core and peripheral literature publication numbers.



Fig. 6. Distribution of the subject category citations of the core and periphery literatures.

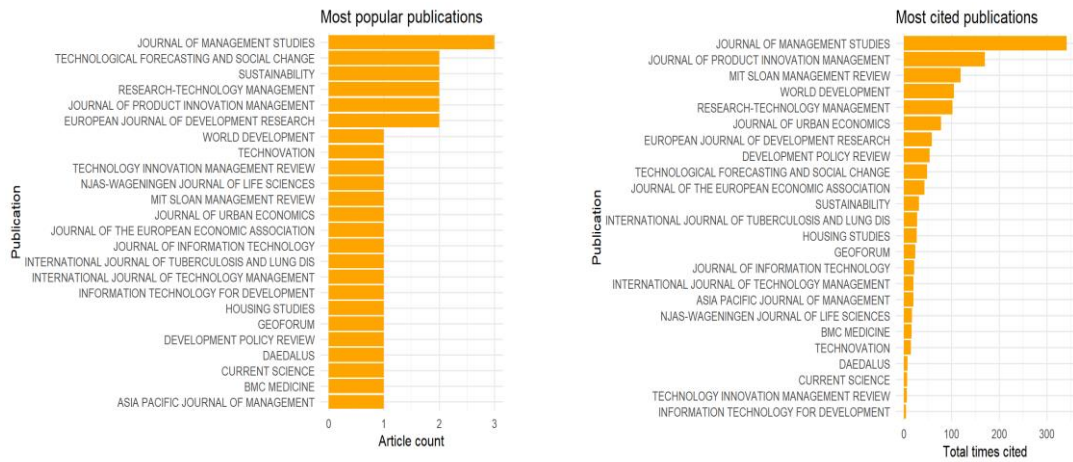


Fig. 7. Most popular and cited publications for the core literature.

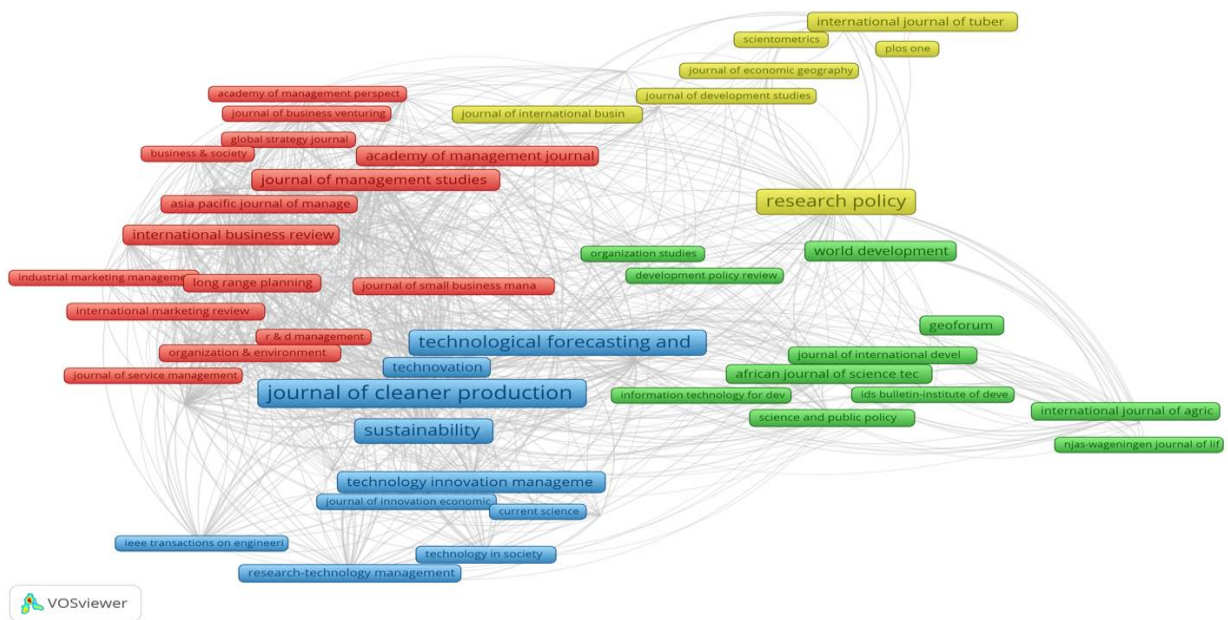


Fig. 8. The map of most cited venues publishing ININ literature (the colors of the map, assigned automatically, show different collections of journals that have high bibliographic coupling).

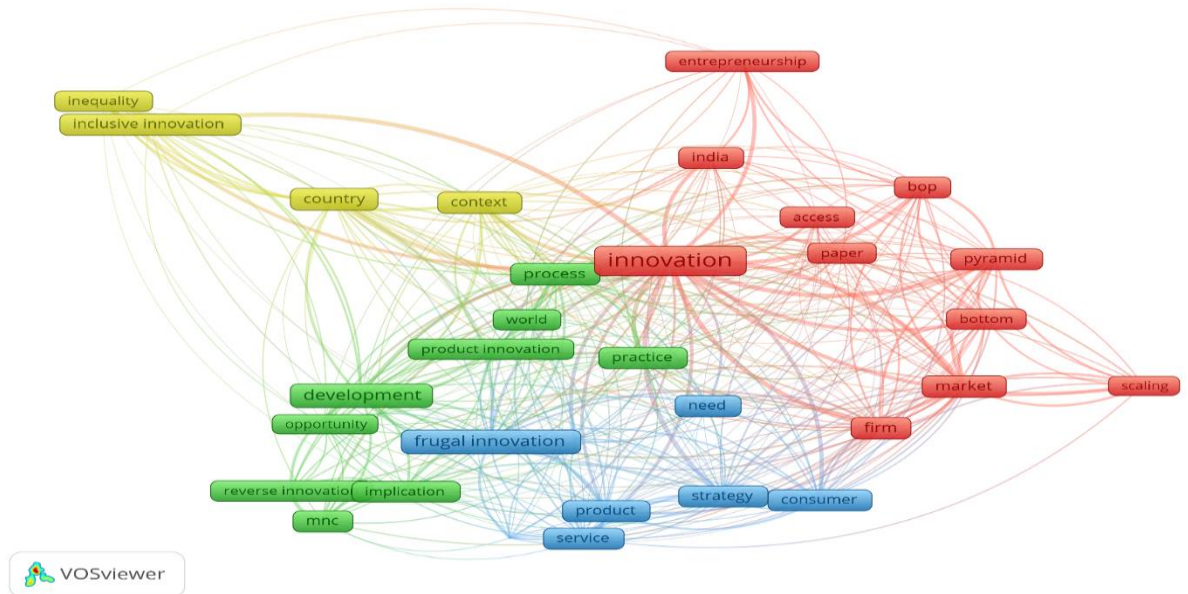


Fig. 9. Map of most important terms that occurred in publications in the field of ININ (the color coding for the boxes was assigned automatically to distinguish the collection of keywords that have high bibliographic coupling).

Inclusive innovation mechanism

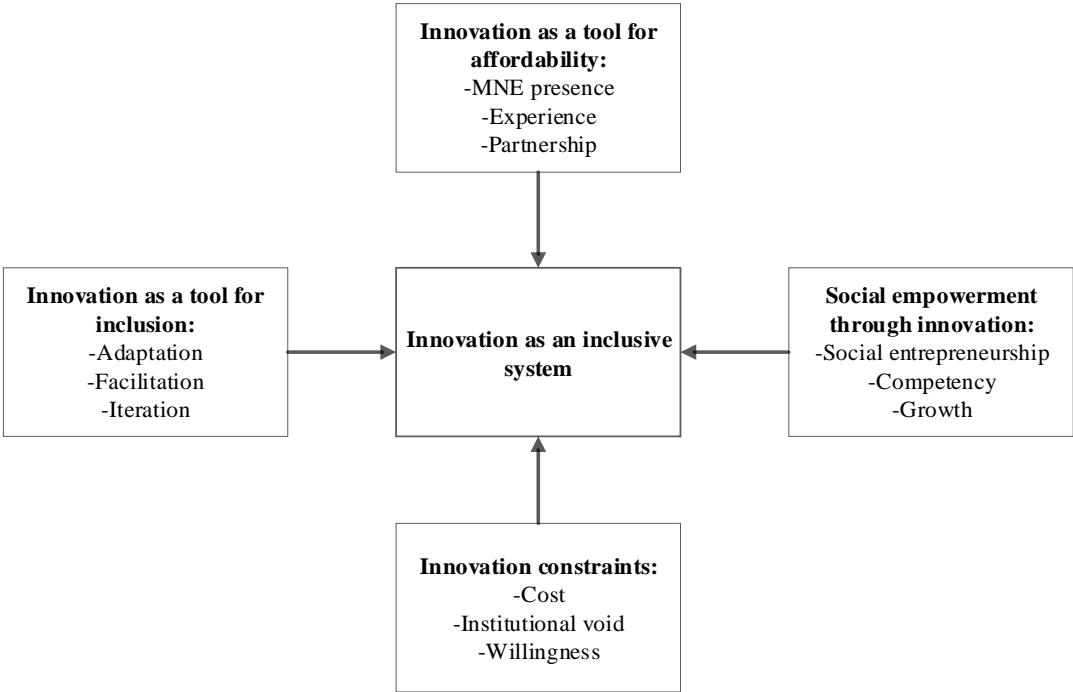


Fig. 10. Inclusive innovation mechanism.

Appendix A

Description of the codes.

Research methodologies	<p>We classified articles into case studies, conceptual or theoretical papers, survey studies, literature reviews, and archival studies. Articles that specifically talked about or focused on several types of research methods were coded as other. All additional methodologies were coded as other.</p>
Industry settings	<p>We coded all articles as single-industry studies, multiple-industry studies, or industry not specified. The more specific industry setting was additionally coded for articles that were coded as single-industry studies. The five industry codes used are as follows:</p> <p>Consumer goods: goods such as textiles, cellphones and appliances, water supply, sanitation, housing, appliances, and medicines were coded in this category.</p> <p>Food and beverage: foods and beverages included various types of edible products and beverages.</p> <p>Transportation and logistics: transportation, tourism, logistics, and other commuting matters. This code also covered related industries, such as road construction.</p> <p>Public administration: government services and public organizations.</p> <p>Services: various types of services in the private or public sector (e.g., healthcare, IT services, telecommunications, banking, and finance energy).</p>
Geographic context of the study	<p>We coded all articles in this category as single-continent studies, multiple-continent studies, or not specified. This refers to the continent or the region in which data were collected or to which the data are related. The specific continents were coded only for articles with a single geographic context.</p>
Cluster codification	<p>Note: The aim of this section is mostly to highlight the motives behind the development of each cluster, but the in-depth analysis can be found in sections three and five of the article.</p> <ul style="list-style-type: none">• Innovation as a tool for affordability: For this cluster, the authors labeled the articles that contained results which primarily focused on innovation for the purpose of affordability through frugal means.• Innovation as a tool for inclusion: For this cluster, the authors labeled the articles that mostly focus on market inclusion of marginalized market communities and avoiding market exclusivity.• Building capabilities and social empowerment through innovation: For this cluster, the authors labeled the articles that mostly focused not only on inclusion and product affordability but also on localization and generating community empowerment.• Innovation constraints associated with social empowerment: For this cluster, the authors labeled the articles that mostly focused on innovation constraints and barriers.• Innovation as an inclusive system: For this cluster, the authors labeled the articles that mostly focused on systems of generating community prosperity.
