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Exploring the Relation Between the Degree of Novelty of Innovations and User–Producer Interaction Across Different Income Regions

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Summary. — User–producer interactions have been recognized as important for innovation. With the rapid growth of emerging economies’ markets, and an increasing degree of technological sophistication of both users and producers in those markets, user–producer interaction is becoming global. Using original firm-level data, this paper explores how collaboration with users in different income regions affects the degree of innovations’ novelty. We find that collaborating with international users is positively related to higher degrees of novelty. Furthermore, firms in low- and middle income countries will benefit more from south–south user collaboration than a south–north one.

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Key words — users, international demand, innovation, absorptive capacity, Europe, BRICS

1. INTRODUCTION

User–producer interactions have been traditionally recognized as important factors in the innovation process (Lundvall, 1988). Hitherto most of the literature on user–producer interactions and its impact on the degree of novelty is based almost exclusively on the evidence of users and producers located in high-income countries (Fitjar & Rodríguez-Pose, 2012; Laursen, 2011). With the rapid growth of emerging economies’ markets, and an increasing degree of technological sophistication of both users and producers in those markets (Altenburg, Schmitz, & Stamm, 2008; Ernst, 2005; Whang & Hobday, 2011), user–producer interaction is becoming global. However, the existing literature is quite limited in explaining how collaborations with users in different income regions affect the degree of innovations’ novelty for producers located in high-income countries, as well as middle- and lower-income countries, which have different degrees of technological capabilities (Castellacci & Archibugi, 2008). This is due to three main shortcomings in the literature.

On the one hand, although many studies (Asheim & Isaksen, 2002; Atuahene-Gima, 1996; Christensen & Bower, 1996) discuss the impact user–producer interaction has on innovation, they do not specify how the interaction relates to different degrees of novelty in that innovation, from new to the firm to new to the world.

On the other hand, most of the literature focuses on the user as a source of information for innovation (Atuahene-Gima, 1996; Augusto & Coelho, 2009; Fitjar & Rodríguez-Pose, 2012; Kohli & Jaworski, 1990; Lettl, Herstatt, & Gemuenden, 2006; Rothwell, 1986) and not as an active partner in the development of the innovation. This view is particularly predominant in the discussion of how multinational enterprises (MNEs) exploit their innovations in international markets by adapting their already developed innovation to particular market needs (learning from exporting), as well as

the extensive literature on market orientation. We argue in this paper that with the increased technological sophistication of international users, this “plug & play” vision is quite limited, and that more active collaboration with the user is needed in order to develop innovations.

Finally, the specific location of both users and producers is almost completely absent from the literature. Most of the authors tend to treat the international user as one single category (e.g., Fitjar & Rodríguez-Pose, 2012; Laursen, 2011), not considering the location of the user, and consequently the differences between users in high-, middle- and low-income countries. Similarly, most of the literature is based on evidence of producers located in high-income countries, thus ignoring differences in the degree of producers’ competencies in different income regions.

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The aim of this paper is to explore the relation that active collaboration with users for innovation has on the degree of novelty by focusing on the location of both users and producers.

In dealing with the above issue, this paper draws on a unique set of firm-level data collected in 2010 in a variety of European countries, as well as Brazil, China, India, and South Africa. The questionnaire collected data on innovation collaboration with customers—as one type of users—in the development of innovations, taking into account their geographical location. The data allow the researcher to distinguish the international locations of customers in high-, middle- and low-income countries.

More specifically, this paper aims to answer two main research questions:

1. For firms located in high-income countries, how does collaboration with customers in high-income countries (north) and low- and middle-income countries (south) relate to the degree of novelty of their product innovations?
2. For firms located in low- and middle-income countries, how does collaboration with customers in high-income, or middle- and low-income countries, relate to the degree of novelty of their product innovations?

By doing so, the paper contributes to the literature on user–producer interaction by including the location of both users and producers as active partners in the development of product innovations, and their relationship to the degree of innovations' novelty on a global scale. Furthermore, by providing empirical evidence on the role of *users from the south* as important partners in innovation collaboration, this paper contributes to discussions on the role of demand for innovation for firms located in high-income countries, as well as those in low- and middle-income countries.

The paper is structured as follows. In the next section we review the literature on user–producer interaction, as well as the geography of the user and producer, and the impact on innovation. In Section 3 we present the data on which the analysis is based. Section 4 contains the main results, and we conclude the paper with a discussion and suggestions for further research.

2. LITERATURE REVIEW

Users, either as individuals or organizations, have long been regarded as key actors in the innovation process (Lundvall, 1988). Producers are highly interested in commercializing their products, and often engage in different activities (market intelligence, customer relations, etc.) to access their users' knowledge and understand their needs (for an overview see Bogers, Afuah, & Bastian, 2010). Users, on the other hand, are motivated to share knowledge conducive to innovation so that products and services fit better with their needs and preferences.

Users in general, and customers in particular, have long been considered as a key source of information for innovation and there is an extensive amount of literature that has analyzed empirically the impact of sourcing as a form of user–producer interaction on innovation. However, the results are not conclusive. While most authors find a positive relationship (Atuahene-Gima, 1996; Augusto & Coelho, 2009; Fitjar & Rodríguez-Pose, 2012; Kohli & Jaworski, 1990; Lettl *et al.*, 2006; Rothwell, 1986), some studies have argued that paying attention to customers has led to the “death” of innovation (Bennett & Cooper, 1979; Christensen & Bower, 1996). What this literature often lacks is a clear

definition of what innovation means and a more nuanced discussion on how user–producer interaction affects the degree of novelty (Garcia & Calantone, 2002).

(a) *Forms of user-producer interaction and the degree of novelty of innovations*

Regarding the degree of novelty, one of the most widely used definitions is The Organisation for Economic Co-operation and Development (OECD) (OECD, 1997). The OECD distinguishes between technologically new and significantly technologically improved innovations¹ on the one hand, as well as new-to-the-firm, new-to-the-industry, and new-to-the-world innovations on the other. An innovation is new to the world if the firm has introduced a new or significantly improved good or service onto the global market before competitors; it is new to the market or industry if the firm is the first in that specific market or industry to have implemented it; it is new to the firm if the innovation was already available from its competitors in its market. New to the world and technologically new are often used in the literature as synonyms for radical or breakthrough innovations, while improved innovations and new to the firm are often used as proxies to incremental innovations.

Among the exceptions in the literature that make specific reference to the degree of novelty, Lukas and Ferrell (2000), argue that market orientation, as a simple form of user–producer interaction, seems to be positively related to breakthrough innovation. In a similar vein, Augusto and Coelho (2009) concluded that sourcing for information from the customer was positively related to breakthrough innovations. Zhou, Yim, and Tse (2005) analyzed the effects of market orientation on breakthrough innovations, and concluded that market orientation has a positive effect on tech-based innovation and a negative impact on market-based innovation. Govindarajan, Kopalle, and Danneels (2011), highlight that the impact on innovation depends on the type of customer. Relating market orientation and innovations with the types of customers, the authors show that focusing on emerging customers is unrelated to radical innovations, while a strategy oriented to mainstream customers may have a positive impact on the degree of innovation.

One of the limitations of this literature is that reduces user–producer interaction to users as sources of information that may be relevant to innovation. It assumes that information from the markets is easily transferable to the innovation processes. However, this “plug & play” vision is disputable. The negative implications of customer orientation are attributable to too narrow an understanding of market orientation strategies (Augusto & Coelho, 2009). As some authors argue (Alam, 2002; Magnusson, 2009) with the increased technological complexity of products, the diversity of markets and the tacit nature of the customer knowledge, customers should be actively involved in different stages of product development needs.

Indeed, when interaction takes the form of *active collaboration* with the users or, in other words, when users are partners in the development of innovation the impact of user–producer interaction on the degree of novelty is much clearer. Scholars in the so-called user-centered innovation literature or lead-user literature (Baldwin, Hienerth, & von Hippel, 2006; von Hippel, 2005) regard users not only as consumers of products, but also as agents who know exactly what they require, thereby allowing them to become innovators of products that are adapted by manufacturers for commercial use later on; Users can also be used for understanding highly advanced needs or as external problem-solvers (Franke & Hippel,

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