Original Article

Frugal Innovation and Development: Aides or Adversaries?

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Abstract Frugal innovations aim to bring products, services and systems within the reach of billions of poor and emerging middle-class consumers. Through significantly cutting costs while safeguarding user value, frugal innovations open opportunities for new business models and may well disrupt innovation processes in entire economies. The debate on the developmental implications of frugal innovation is ideologically polarized. Whereas advocates suggest a business view of 'win-win' in which companies can earn profits while simultaneously alleviating poverty, critics argue that frugal innovation will merely exacerbate capitalist exploitation and inequality. In this contribution we argue that an empirical approach is needed to assess where and when frugal innovation is more likely to enhance inclusive development.

Les innovations frugales portent des produits, des services, et des systèmes à la portée de billions de consommateurs pauvres et de l'aspirante classe moyenne. Les innovations frugales baissent les couts et préservent la valeur pour les consommateurs, et créent des nouveaux modèles économiques qui ont le potentiel de perturber les processus d'innovation dans plusieurs économies. Le débat sur les implications développementales de l'innovation frugale est idéologiquement polarisé. Les défenseurs des innovations frugales suggèrent un scenario d'affaires bénéfique pour toutes les parties, ou les entreprises peuvent réaliser des profits simultanément soulageant la pauvreté. Les critiques des innovations frugales soutiennent qu'elles vont simplement augmenter l'exploitation capitale et l'inégalité. Dans cet article, on soutien qu'un approche empirique est nécessaire pour établir où et quand une innovation frugale est plus susceptible de soutenir le développement inclusif.

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> The world of business is witnessing a frugal innovation revolution. In almost every industry a few, forward-thinking companies are championing the quest to do more, and better, with less. (…) these frugal innovation pioneers are rewriting the rules of the game; in some industries, they are changing the game entirely (Radjou and Prabhu, 2014, p. 215).

Frugal innovation is a new innovation manifestation that aims to bring products, services and systems within the reach of billions of poor and emerging middle-class consumers at the Middle and Base of the Pyramid (Bhatti, 2012; Zeschky *et al*, 2014). By dramatically cutting costs while safeguarding user value and technological sophistication, frugal innovation has been hailed as potentially disruptive of innovation processes, business models and even entire economies (Tiwari and Herstatt, 2012; Rao, 2013; Radjou and Prabhu, 2014). Schumpeter (1934) already highlighted the role of innovation in economically transforming societies, through the process of 'creative destruction'. Because of its focus on including low-income producers and consumers in the innovation value chain, frugal innovation is expected to disrupt existing capital-intensive and top-down forms of innovation, contributing to more inclusive forms of development (van Beers *et al*, 2013; Chataway *et al*, 2014). Yet it should be empirically questioned whether frugal innovation will indeed be able to play this role (Papaioannou, 2014). In an article on Improved Cook Stoves, a quintessential example of frugal innovation, Abdelnour and Saeed (2014, pp. 158–159) highlight both the positive and the negative potential of frugal innovation in relation to development:

> According to stove advocates, through the simple act of cooking, the global poor will decelerate deforestation, impede global warming, reduce sexual violence, improve family health, develop 'sustainable markets', and produce an enduring stream of carbon offsets. (…) [Yet from a different perspective] technical panaceas justify the expansion of global industry and the conversion of poor beneficiaries into mass consumers of rescuing (Western) technologies, techniques, and business models. (…) The stove panacea inadvertently (and very subtly) transfers the world's most serious problems into the private lives of the most vulnerable.

The discussion surrounding frugal innovation and development, so far, has been ideologically polarized (Dolan and Roll, 2013; Chataway *et al*, 2014). Whereas advocates suggest a business view of 'win-win' in which companies can earn profits while simultaneously alleviating poverty (Prahalad, 2006), critics argue that frugal innovation will merely exacerbate capitalist exploitation and inequality (Schwittay, 2011; Dolan, 2012). A focus should be established on actor agency (who has the power to do what and under which circumstances) and power inequalities in the political economy (between multinationals and consumers, for example) (Szirmai, 2005). In this article we aim to outline such theoretical debates and to move towards a more empirical approach that is still scarce (Kolk *et al*, 2013). While acknowledging global inequalities in the development arena, we propose to focus on what frugal innovation can do to these inequalities, for example, through technological innovation or through co-creation that involves local as well as international producers (Chataway *et al*, 2014). By adopting an evidence-based approach, the developmental relevance of the concept of frugal innovation can be further explored. If frugal innovation is indeed 'changing the rules of the game' (Radjou and Prabhu, 2014, p. 215), in terms of innovation and development processes, what then will be the most likely effects?

This article is structured as follows: First, a brief overview of frugal innovation and its main characteristics will be provided. Second, the theoretical debate on whether frugal innovation can stimulate 'development' or whether it will lead to 'capitalist exploitation' will be outlined. Third, a case study of mobile money in Kenya and Zambia will be presented, in order to illustrate the theoretical debates with empirical findings. Finally, some concluding remarks on the developmental potential of frugal innovation will be offered together with propositions for a research agenda.

What Is Frugal Innovation?

In 2010 *The Economist* put frugal innovation in the spotlight and since then it has become an emerging field of scientific interest, accompanied by fast expanding use in the business and management community about the novelty of the phenomenon (*The Economist*, 2010; Bhatti, 2012; George *et al*, 2012; Tiwari and Herstatt, 2012; Radjou and Prabhu, 2014). Frugal innovation involves (re)designing products, services or systems to significantly cut costs, without sacrificing user value, so as to reach a mass customer base, especially in low-income settings (Bhatti, 2012; Tiwari and Herstatt, 2012; Rao, 2013). In addition to a market in developing countries in Asia, Latin America and Africa, frugal innovation can also appeal to cost-conscious consumers in Europe and North America (Govindarajan and Ramamurti, 2011; Radjou and Prabhu, 2014). A range of products and services has resulted from frugal innovation processes, such as Tata's Nano car, portable ultrasound devices, mobile money services and single-use OMO washing powder sachets suitable for cold water (Agarwal and Brem, 2012; van Beers *et al*, 2012; Prahalad, 2012). Because the low-income setting often involves institutional and resource constraints – such as limited capital resources, lack of basic provisions, weak infrastructure or poor governance – innovation has to follow a path different from the capital-intensive and research and development-led process common in Western markets (Kaplinsky, 2011; Bhatti, 2012). In short, frugal innovation involves rethinking entire production processes and business models, as well as innovation cycles (*The Economist*, 2010; Rao, 2013). What has conditioned the present emergence of frugal innovation and what changes does frugal innovation bring to the innovation cycle?

Until recently, dominant innovation processes (concentrated in Europe and North America) remained largely capital-intensive, high-tech and exogenous to the low-income context (Kaplinsky, 2011). Although the Appropriate Technology movement of the 1970s tried to change this by developing technologies that are suited for low-income countries, being labour-intensive, simple to operate and repair, produced for low-income consumers at small scales and with minimally harmful impact on the environment, this has remained largely 'below-the-radar' and was promoted almost exclusively by NGOs (Schumacher, 1973; Clark *et al*, 2009; Kaplinsky, 2011). The recent emergence of frugal innovation has been underpinned by a specific mix of factors related to the global economic, technological and innovation environment and is primarily driven by international and local businesses (Bhatti, 2012). The development and extension of Global Value Chains has heightened international competition, reshaped global production and trade and afforded a new role to (low-income) consumers (Kaplinsky and Farooki, 2010; Gereffi, 2014). Related to this is the global diffusion of capabilities, coupled with rapid population and economic growth in Asian and African countries (Kaplinsky, 2011). Because the low-income consumer base has expanded so rapidly, innovation has been geared towards reaching these high-potential markets (Dolan and Roll, 2013). This has been attempted through so-called 'polycentric innovation' in which multiple actors are supposed to collaborate (Radjou, 2009), without highlighting the inherent conflicts of interest among the various actors. The trade collapse in 2008 further accelerated the shift in end markets from the North to the South, challenging the dominance of Western types of innovation (Gereffi, 2014). These factors can provide opportunities for agency by low-income producers and consumers, who no longer have to rely on technology transfer from developed markets, but might even – in the most optimistic scenario – function as co-creators of innovation (Chironga *et al*, 2011). Furthermore, there has been a policy shift away from state direction in innovation and industry, towards an emphasis on private enterprise (Kaplinsky, 2011; Blowfield and Dolan, 2014). Private Sector Development (PSD) entails a valorization of private enterprise, market efficiency, entrepreneurship and the conviction that markets can work for the poor (Schulpen and Gibbon, 2002; Blowfield and Dolan, 2014). This has far-reaching consequences for developing countries, as PSD discourse holds that business might succeed where governments and aid donors have failed, namely in alleviating or even eradicating poverty (Arora and Romijn, 2011). The dominant innovation trajectory has, thus, by necessity been challenged by new paradigms such as frugal innovation (Hammond *et al*, 2007; Kaplinsky, 2011; Radjou and Prabhu, 2014).

Frugal innovation challenges all the steps in the innovation cycle, from idea to business model, marketing and consumption (Radjou and Prabhu, 2014). Tiwari *et al* (2014, p. 18) suggest that frugal innovations are:

> new or significantly improved products (both goods and services), processes, or marketing and organizational methods that seek to minimize the use of material and financial resources in the complete value chain (development, manufacturing, distribution, consumption, and disposal) with the objective of significantly reducing the total cost of ownership and/or usage while fulfilling or even exceeding certain pre-defined criteria of acceptable quality standards.

If frugal innovation is to provide low-cost goods, services and systems, the entire innovation value chain has to be tackled. Bhatti (2012, p. 18) proposes that frugal innovation ‘may redefine business models, reconfigure value chains and redesign products to use resources in different ways and create more inclusive markets by serving users with affordability constraints, often in a scalable & sustainable manner’. Frugal innovation implies that existing capital-intensive top-down innovation processes should become more interactive and polycentric, affording a more prominent role to local producers and consumers, that the business model should be adjusted to enable scaling, that marketing might have to become more inventive by using smaller packaging or alternative distribution systems and so on (Radjou and Prabhu, 2014). The focus of frugal innovation on low-cost, affordable innovations that make life easier and that improve the economic, social and environmental conditions of consumers could therefore has considerable consequences for development processes (Agarwal and Brem, 2012; Bhatti, 2012).

When Are Frugal Innovations More Likely To Also Be More Inclusive?

Schumpeter (1934) emphasized that innovations are a dominant force in economically transforming societies, by means of ‘creative destruction’. Furthermore, innovation can play a role in reorienting economic growth in more developmentally satisfactory ways (Chataway *et al*, 2014, p. 50). Yet while innovation might help address poverty challenges, ‘mainstream innovation is associated with increasing inequality’ (Heeks *et al*, 2014, p. 176; Santiago, 2014, p. 1). The use of capital-intensive, large-scale and environmentally damaging technologies has even caused the decoupling of socio-economic growth and development (Kaplinsky, 2011; Chataway *et al*, 2014). Disrupting established innovation processes, frugal innovations might prove to be examples of Schumpeterian creative destruction that have the potential to boost local economic development in low-income settings (Rao, 2013). Inclusive innovation can be defined as ‘the development and implementation of new ideas which aspire to create opportunities that enhance social and economic[1] well-being for disenfranchised members of society’ (George *et al*, 2012, p. 663). Inclusive and pro-poor innovations have been described as ‘a multi-stakeholder social learning process, that generates and puts to use new knowledge and which expands the capabilities and opportunities of the poor’ (Berdegué, 2005, p. 15). This entails a collaborative effort among ‘public R&D entities, industry, universities, nongovernmental organizations, donors and global networks’ (World Bank, 2010, p. 338). More so than conventional types of innovation and technology networks, frugal innovation may allow the incorporation of the values of Asian and African producers and consumers in the design, production, marketing and distribution of frugal products, systems and services (Chataway *et al*, 2014). Because of its polycentric nature that links actors in the formal and informal sectors across different countries, frugal innovation might play a role in creating sustainable economic growth and inclusive development (Papaioannou, 2014). Will frugal innovation lead to sustained and equitable economic growth, or will it merely benefit a privileged few while exploiting others (George *et al*, 2012; Dolan and Roll, 2013; Cozzens and Sutz, 2014)?

In the literature there have been two quite different assessments of whether frugal innovation will be able to contribute to inclusive innovation and development (Cross and Street, 2009; Chataway *et al*, 2014). On the one hand, the ability of international business to serve the needs of the ‘Bottom of the Pyramid’ (BoP) has been celebrated as a ‘win-win’ proposition that would generate profits and simultaneously alleviate poverty (Prahalad, 2006). The BoP discourse suggests that business can find fortune by serving ‘the billions of *aspiring poor* who are joining the market economy for the first time’ (Prahalad and Hall, 2002, p. 1). Those living on less than

US $2 a day, an estimated 4 billion people worldwide, would constitute a 'mega market' of 'micro consumers', who are underserved by existing products and services and would therefore be receptive to frugal innovations (Hammond *et al*, 2007; Landrum, 2007). Through mutual value creation, poverty eradication would be 'reconcilable with a profit-maximizing objective within an enterprise-based market system' (Ansari *et al*, 2012, p. 814; London *et al*, 2010). Increasingly, private sector actors have been targeting inclusive innovation for poor consumers as a source of sales and profit (Schulpen and Gibbon, 2002; Blowfield and Dolan, 2014). Ideas of 'inclusive business for the poor' (alternatively 'social business', 'pro-poor business' or 'inclusive capitalism') have sought to marry profits with social aims, assuming that 'business activities can contribute to the long-term goal of poverty alleviation by embedding the neglected poor parts of the world population into efficient value chains and market structures' (Hahn, 2012, p. 51).

On the other hand, the potential contribution of business to inclusive development has been seriously questioned (Schwittay, 2011; Dolan, 2012). Critical approaches to the BoP literature suggest that a better understanding is required on how corporate profits and the needs of the poor might be combined, whereas others simply outright dismiss such possible win-win scenarios (Cross and Street, 2009; Arora and Romijn, 2011). BoP rhetoric might even aggravate poverty and inequality, by reconstituting the poor as 'modern' and value-conscious consumers, with unmet needs and wants that can only be satisfied through capitalist enterprise and market involvement (Dolan, 2012). Multinationals might well crowd out local resources, transfer inappropriate technologies or practices and enhance dependency (Hansen and Schaumburg-Müller, 2010). The unequal power relations between multinationals and poor consumers thus have to be acknowledged (Karnani, 2007; Ansari *et al*, 2012). More so than multinationals, the informal economy might be suited to enable responsiveness to shifting demand, skills development and participation in global value chains, to facilitate the role of intermediary organizations and to provide knowledge of the societal and political context (Cozzens and Sutz, 2014). Because of its open employment structure, ideas diffuse rapidly in the informal sector (Meagher and Lindell, 2013; Cozzens and Sutz, 2014). It should be questioned as to what extent 'incorporating the informal economy into global business models and participatory systems of service provision empower[s] Africa's [and Asia's] informal entrepreneurs and workers, or does it capture their energies to cut costs and increase profits for others?' (Meagher and Lindell, 2013, p. 59).

Although frugal innovation might have the potential to be inclusive, it is not inherently so (Papaioannou, 2014). Frugal innovation can involve low-income producers in the design, production and marketing process, yet it might equally be that multinationals design, produce and market frugal innovations that end up jeopardizing local entrepreneurs (Ansari *et al*, 2012). Despite the aim of frugal innovation to provide 'total product solutions' that better fit the environment and tastes of low-income consumers, this does not always succeed (Mendoza and Thelen, 2008, p. 451). After all, 'introducing new markets may create new vulnerabilities and disrupt rather than enhance social harmony' (Ansari *et al*, 2012, p. 817). Critics argue that business-led fugal innovations cannot address 'the root structural causes of poverty and inequality' (Banks and Hulme, 2014, p. 193). Indeed, 'inclusiveness is a multi-dimensional concept that cannot be realized if people are offered low-quality products' (Papaioannou, 2014, p. 195). Development is rather 'an economic *and* social process that also facilitates redistributions of power, representation and accountability, and more inclusive social, economic and political institutions' (Banks and Hulme, 2014, p. 189). Multiple actors from all sectors of society, including multinationals and consumers, will thus have to be involved if a structural solution to global poverty is to be achieved (Badiane and Berdish, 2011). In this respect, the polycentric approach underlying frugal innovation might enable more inclusive forms of innovation and development (Heeks *et al*, 2014).

Existing views on the inclusive potential of frugal innovation are overtly polarizing, juxtaposing a business view of a win-win scenario with a critical view of capitalist exploitation of the informal sector (Dolan, 2012). Yet frugal innovation might offer a more nuanced middle ground. It should be questioned, if so, as to what extent bottom-up innovations have more potential for generating equitable economic growth than that of top-down innovations, as it might be that 'both top-down and bottom-up processes are crucial in the sourcing and driving forward of inclusive innovation initiatives' (George *et al*, 2012, p. 677). Frugal innovation, because of its polycentric nature that combines top-down and bottom-up innovation processes, as well as different actors, might enable more inclusive forms of innovation and development. Such a stance would escape the 'development versus exploitation' debate, by suggesting that frugal innovation seeks to combine local ideas and knowledge with international expertise in inclusive value chains to develop low-cost products that enjoy maximum user value (Bhatti, 2012). Still, detailed empirical studies are required to ascertain whether frugal innovation will lead to equitable economic growth or whether it will merely sustain existing inequalities (Arora and Romijn, 2011). One case that can illustrate the previous debates is the example of mobile money services in Kenya (M-PESA) and Zambia (Zoona).

An Illustrative Example: Mobile Money And Financial Inclusion

Mobile money services, and the Kenyan example of M-PESA in particular, have been labelled exemplary cases of frugal innovation, because of their ability to reduce the costs of financial transactions, their mass market and their technological sophistication (Radjou and Prabhu, 2014). Mobile money enables a 'faster, cheaper, and more efficient way of moving money' (Hughes and Lonie, 2007). The success of mobile money services has given rise to a 'transformational narrative':

> The rapid uptake and extensive reach of the application has led many development practitioners to argue that M-PESA, and similar applications, have the potential to become 'transformational'. That is, they can extend the reach of financial services to the unbanked segment of the population. According to some, such services provide a foundation for economic development, and, in particular, allow the poor to climb the 'banking ladder' by facilitating access to the formal economy. Furthermore, it is asserted that through such participation the poor can increase their wealth, diversify their asset base and become more resilient to shocks (Morawczynski, 2009, pp. 509–510).

Especially within 'ICT for development' debates, mobile financial services have been connected to 'financial inclusion' and even 'economic transformation' (Heeks, 2014).

Yet, despite such positive claims, 'questions remain regarding the nature and extent of m-money's effect on the welfare of poor users in developing countries' (Aker and Mbiti, 2010, p. 222). After a detailed ethnographic study of M-PESA, Morawczynski (2009, p. 521) concluded that 'there are clear limitations to the transformational potential of mobile financial services', for example, relating to gender and rural-urban inequalities. Wealth inequalities might not be effectively addressed through mobile financial services, as 'on average M-Pesa users are wealthier, better educated, urban, and "already banked"' (Aker and Mbiti, 2010, p. 221). Pessimistic authors argue that mobile money and its capitalist underpinnings will merely exacerbate global inequalities and the exploitation of the poor (Ya'u, 2004; Murphy *et al*, 2014). Murphy *et al* (2014, p. 265) assert that narratives of financial inclusion and promises of economic development through ICTs 'often overlook the interdependencies and power relations that mediate the potential for African societies to empower themselves within the GIE [global information economy], contingent relations that may exclude some economic actors whilst including, connecting and sometimes exploiting others'. Conceptually, the discussion surrounding mobile money in Africa has thus evolved along the lines of the 'development versus exploitation' debate outlined for frugal innovation earlier (Morawczynski, 2009). Mobile money provides a unique entry point to assess these theoretical claims in a more empirical manner.

Even though mobile money agents, who act as intermediaries between network providers and customers, play such a crucial role in enabling financial inclusion by spreading mobile money services, there 'is little evidence from the literature concerning their impact on livelihoods' (Duncombe, 2012, p. 573). Research among mobile money agents in Kitwe, Zambia, suggests a balanced assessment of the potential of mobile money services to contribute to financial inclusion and economic transformation (Peša, 2015). Network operators claim that becoming a mobile money agent can enhance entrepreneurship, business opportunities and financial inclusion. Zoona, for example, asserts that it 'offers entrepreneurs [agents] an opportunity to build their own businesses and create wealth and employment by providing mobile payment solutions, financial services, business management tools and support' (www.kiva.org/partners/210, accessed 28 October 2015). A number of agents has indeed been able to make high profits through commissions on transactions, yet not all agents benefit from their engagement with mobile money services. Casualisation has resulted from the franchising structure of mobile money services. Network operators contract agents as independent business owners, giving them freedom to employ tellers as dependent labourers. Tellers make long hours in the kiosks, often without any formal contract, and they receive very low payments. Mobile money has thus created new inequalities between agents as productive entrepreneurs and tellers as precarious labour. On the consumer side, mobile money has enabled consumers to more easily access money, and it facilitates making productive investments, but the effects of this on economic well-being remain heavily debated as such growth is likely to reinforce inequalities (Aker and Mbiti, 2010; Duncombe, 2012; Heeks, 2014). In the long run, this inequality might jeopardize the potential of mobile money to contribute to financial inclusion and development (Peša, 2015). Neither celebratory rhetoric of financial inclusion, economic transformation and development nor simplistic views of capitalist exploitation should be wholeheartedly embraced, as Duncombe (2012, pp. 582–583) concludes:

> On the one hand, mobile phones are viewed as a form of innovation that can make markets more inclusive for the poor (…) [by] facilitating access to market information and transactions, creating direct development impact for the poor through personal access and usage, and providing potential for financial viability, given their relatively low cost and ability to handle small (micro) quantities and transactions. On the other hand, research also suggests that such market processes give rise to inbuilt inequalities of access and ownership (…) Thus the benefits of market inclusiveness remain denied to a large proportion of the poor (and certainly the poorest) who still lack access or the means to make effective use of expanding mobile phone networks.

Only through detailed empirical research can theoretical debates about the developmental relevance of frugal innovation be advanced.

Concluding Remarks and Future Research Agenda

The concept of frugal innovation has gained sway since 2010 among practitioners, policy makers and academics alike. Yet, what frugal innovation is and what its developmental relevance might be remain heavily debated. Whereas some authors argue that frugal innovation will lead to sustainable economic development and more inclusive forms of innovation, others suggest that frugal innovation will prove unable to address structural inequalities within the political economy or that it might even exacerbate capitalist exploitation of low-income settings. Frugal innovation proposes profound changes to the innovation value chain, changes that might have inclusive developmental outcomes, if low-income producers and consumers are included in innovation processes on a more equal footing than before. Yet, it is questionable whether frugal innovation alone will be able to address power inequalities on a global and local level, for example, relating to gender, wealth or power inequalities between Western multinationals and low-income consumers. This article has sought to outline such debates, while foregrounding the need to embed theoretical debates in empirical evidence. Tentative empirical studies suggest that frugal innovation can have both positive and negative developmental outcomes, but further studies are imperative to reach firmer conclusions. Because frugal innovation is still an emerging field of study, we will conclude by suggesting some future research directions to explore the relationship between frugal innovation and development.

Most importantly, empirical studies are much needed to advance the existing debates on frugal innovation. A main aim of empirical studies should be to look at frugal innovation through the lens of local economic development but at the same time to relate local processes to national and global levels. Such empirical studies can generate a better understanding as to which actors play a role in frugal innovation, both internationally and locally. For example, can differences be observed between actors in terms of market segments served, type of frugal products and services designed, produced and marketed, technologies used, business models, enterprise form (MNCs, SMEs, micro-entrepreneurs), participation in and organisation of innovation and technology networks, compliance to safety and sustainability standards, governance, legal frameworks and so on? And can these different manifestations inform us about the effects of different kinds of frugal innovations on local economic development? What are the power relations between different kinds of actors, for example? Ideas of polycentric innovation suggest benevolent collaboration and even co-creation, but multinationals might still dominate innovation processes and crowd out local resources. Empirical studies can further generate better insights into the appropriate social and institutional preconditions for frugal innovations. The main question here is to what extent and how the environment in which actors operate is enabling frugal innovations that stimulate local economic development. Governance issues, such as the legal dimensions of innovation, the availability of and access to financial institutions, the role of knowledge centres (universities, think tanks, laboratories, vocational training institutes), governmental policies on innovation and industrial development, all need to be better understood. For this, it is important to conduct empirical studies that can take frugal innovation out of the Indian and Asian context, to introduce the concept to the African and Latin American context, where it has barely been applied so far. Does frugal innovation in Latin America and Africa enjoy the same dynamics as in Asia, and does it have similar developmental effects? Moreover, an integrative approach towards frugal innovation is desirable. Viewing technical aspects of production in conjunction with business models and patterns of consumption and the BoP can yield a more balanced assessment of the dynamics and effects of frugal innovation. Therefore, only through detailed empirical studies can the developmental potential of frugal innovation be properly assessed. Irrespective of where and when frugal innovations are more likely to contribute to development, it seems clear that processes of frugal innovation are likely to become a key dimension of economies in the Global South as well as the Global North. So, as development researchers, we better work hard to broaden our analytical toolkit in order to better understand how frugal innovations are impacting on global development.

Note

1. In this article we do not deal with the environmental/ecological dimension.

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