



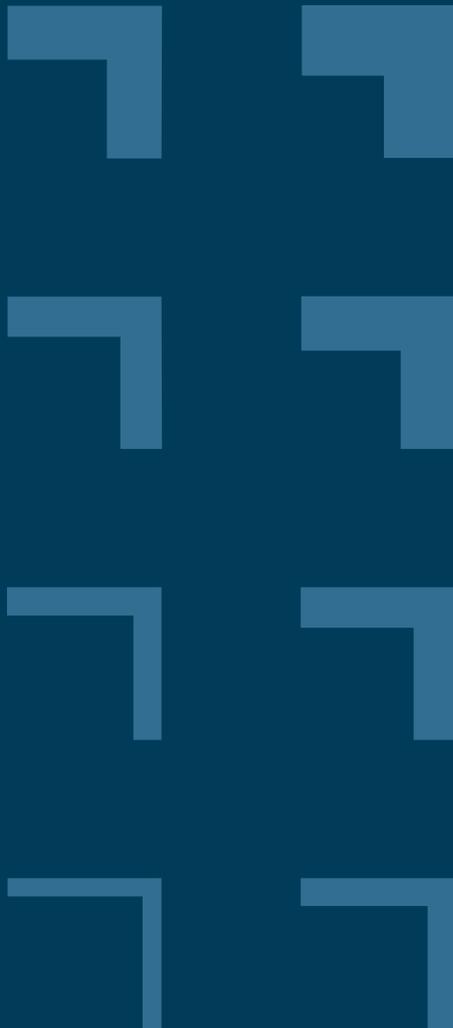
**Technology and
Innovation Management**
at Hamburg University
of Technology

Working Paper

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August 2018
Working Paper 104



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Soft Power of Frugal Innovation and its Potential Role in India's Emergence as a Global Lead Market for Affordable Excellence

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Abstract

The phenomenon of frugal innovation, as characterized by “affordable excellence”, is experiencing increasing acceptance by business leaders, policy makers and scholars around the world. Frugal products, services and technologies strive to radically increase affordability while significantly reducing their environmental footprint through careful and prudent use of resources. It is expected that frugal solutions will be increasingly necessary in both the developed and developing world to ensure social inclusion, environmental sustainability and continued economic growth.

Traditionally, frugality has been regarded as a social virtue in India and the socio-cultural context of the country provides a fertile environment for the development of frugal products and services. Not surprisingly, considerable research shows that discussions of frugal innovations have been closely associated with India. This concept has now begun to spread to other developing and industrialized nations. A primary objective of this conceptual paper is to showcase how frugal innovations emanating from India have found acceptance in other corners of the world and why they contribute to India's soft power on a global stage.

We argue that frugal innovations can potentially provide a useful medium for a benevolent power that aims to promote peaceful coexistence, inclusive growth and prosperity around the world. Indian firms and policymakers should not become complacent about their existing businesses and fail to comprehend the importance of frugal innovation. They would be well advised to retain their focus on creating *customer value* and avoid falling prey to the dominant logic of potentially wasteful, unsustainable and exclusive innovation approaches. Instead of focusing on delivering “more for more for few” they should rather continue to focus on delivering “more for less for many”. The demand for affordable and sustainable excellence is sure to grow globally and India can establish itself as a global soft power in the process.

Keywords: Frugal Innovation; Lead Markets; Resource-constrained Innovation; Reverse Innovation; Soft Power, Frugality; Culture

Note: An edited version of this paper is scheduled to appear as a chapter in a forthcoming book on Indian soft power by the Ananta Aspen Centre.

1. Introduction

In recent years the phenomenon of “frugal innovation” has gained traction in social discourse (Tiwari, Fischer, and Kalogerakis, 2017b). Frugal products are often thought to enable people and enterprises to do “more with less” (Radjou and Prabhu, 2015; Prabhu, 2017), which in some ways contradicts the established innovation paradigms in the Western world of doing “more with more” (cf. Samuelson, 1947). In the post-World War II era, companies in the industrialized world have generally operated in affluent but saturated markets. As a result, they have developed an innovation culture geared towards achieving technological excellence with the means of intense research and development (R&D) work: creating ever “better” products with new and more features to induce customer demand and ensure economic growth (Prabhu and Jain, 2015; Tiwari, Fischer, and Kalogerakis, 2017a).

The pursuit of technological excellence through this dominant approach to innovation has, at times, come at the cost of market orientation. While customers in the industrialized nations have often been “over-served” with technological functions, a large number of customers in the developing world have been left out or at best under-served (Prabhu, Tracey, and Hassan, 2017). This unserved and under-served space for affordable products and services that fulfil quality and safety standards has led to the pursuit of frugal innovations. Several studies point to the great potential for frugal solutions in the emerging market economies and other developing countries where, on the one hand, strong resource constraints limit the purchasing power of both B2C and B2B customers, while, on the other hand, the growing middle-class propelled by a young population aspires for increased consumption (Maira, 2005; Tiwari and Herstatt, 2012b). Indeed, some locate the primary cause of the growth in India’s overall consumption in the increased availability of affordable products and services than in the increased disposable income (e.g., Bijapurkar, 2009).

More recently, several scholars have also pointed towards the emerging demand for frugal products and services in the industrialized nations (Bound and Thornton, 2012; Radjou and Prabhu, 2015). The European Commission and Germany’s Federal Ministry of Education and Research (BMBF) have recently funded studies to investigate potential relevance of frugal innovations for the European Union and Germany respectively (Kroll, Gabriel, Braun et al, 2016; Tiwari et al, 2017a). The growing demand for frugal solutions in the industrialized world is generally thought to be driven by increasing financial constraints, environmental concerns and the feature fatigue caused by the hyper-complexity of available products (Tiwari et al, 2017b).

The demand for affordable and resource-effective products in the West has led to a reverse flow of innovations from emerging market economies to the industrialised world, challenging the prevailing theory of the international product lifecycle (Vernon, 1966). Govindarajan and Trimble (2012) have called this phenomenon “reverse innovation”, while others have connected it conceptually to the recent emergence of “lead markets” in developing countries (Tiwari and Herstatt, 2012a; 2014).

Across industries, India seems to have acquired the role of a pioneer for innovations that combine extreme affordability with the requisite excellence (Kumar and Puranam, 2012; Tiwari and Herstatt, 2012a; Hagenau and Tiwari, 2017). India’s emergence as a lead market

for frugal innovations also creates the possibility of frugal innovations contributing to the country's soft power on the world stage. Factors such as technology, education, and economic growth have emerged as key sources of international influence in today's world (Nye, 1990). A nation's capacity for creativity and innovation is likely to enable her greater influence on the world stage than the hard power emanating from military might (Wilson, 2008). Specifically, such influence contributes to a nation's soft power, namely its "ability to affect others to obtain the outcomes one wants through attraction rather than coercion or payment" (see Nye (2008: 94). Soft power, therefore, "rests on the ability to shape the preferences of others" (Nye, 2008: 95), and is achieved when other countries admire and seek to emulate certain aspects of a nation's civilisation (cf. Foo, 1996). Primary resources of soft power are thought to be culture, political values and foreign policy (Nye, 2008).

The objective of this paper is to investigate India's emergence as a hub (lead market) for frugal innovations with global appeal and the underlying reasons behind it. The paper offers an overview of India's strengths and weaknesses on the innovation front and discusses the implications of these for the soft power it can project. The remainder of this paper is organised as follows: Section 2 defines the concept of frugal innovations and shows its linkages to India. Section 3 showcases some examples of successful frugal innovations from India that have succeeded abroad. Section 4 examines the reasons behind India's emergence as a lead market. The paper ends with a discussion in Section 5.

2. The Concept of Frugal Innovation

It was the late C.K. Prahalad who, at the turn of the millennium, drew attention to the great untapped market opportunity for affordable products and services at the bottom of the economic pyramid and called on firms to tap into this business opportunity as a way of "doing well by doing good" (Prahalad and Hart, 2002; Prahalad, 2004). Prahalad (2000) also characterized India as a potential source of innovations targeted at the global poor and the under-served at a time when, barring for notable exceptions such as Sanjaya Lall (1980), hardly anyone saw developing nations as a source of meaningful innovations for markets beyond their own boundaries. Since then, the initial "Bottom of the Pyramid" (BOP) approach, basically targeted at "poor" consumers, can arguably be said to have evolved into the concept of frugal innovations that encompass products, services, business models and technologies for resource-constrained settings aimed at both business-to-consumer (B2C) as well as business-to-business (B2B) segments.

Frugal innovations enable "affordable excellence" and can be defined as products, services, business models and technologies that seek to create attractive value propositions for their targeted customers by focusing on the required functionalities while minimizing the unnecessary use of material and financial resources in the entire value chain. Frugal innovations substantially reduce the total cost of ownership while remaining compliant with relevant quality and safety norms. They usually also seek to disrupt prevailing industry standards set by incumbent firms by exploring unusual product architectures (Herstatt and Tiwari, 2017).

It is important to note that frugal innovations, apart from adhering to qualitative excellence, ideally cater to four different types of affordability: i.e., apart from monetary affordability to

the customer, they also should strive to ensure societal, infrastructural and environmental affordability in their target markets (Tiwari, 2017). Ensuring adherence to these four dimensions of affordability turns frugal innovations into a potent vehicle for achieving sustainable development goals (SDG), connects them to the principles of circular economy, and, crucially, ensures the long-term success of frugal innovations. Research has also shown that frugal innovations can lead to greater social inclusion (George, McGahan, and Prabhu, 2012; Ernst, Nari Kahle, Dubiel et al, 2015). Studies suggest that frugal solutions can help increase agricultural productivity, reduce losses in the food processing value chain and enhance food security around the world, which will be increasingly crucial to feed the increasing population of human and livestock population and maintain social harmony (cf. Tiwari and De Waal, 2018). For example, Indian scientific institutions have developed highly effective yet affordable (smartphone-based) solutions that can help farmers in assessing the exact need for fertilizers. They help reduce the costs by helping avoid the overdose of fertilization, reduce the need for resources and have a positive impact on environment and human health (Tiwari and De Waal, 2018).

Now well-known examples of frugal innovations include the electrocardiogram (MACi) developed by General Electric, heart surgeries at the Narayana Hrudayalaya, and the Swachh water-filter developed by Tata Chemicals that can run without electricity (Prabhu and Jain, 2015; Ramdorai and Herstatt, 2015). Frugal solutions from India's healthcare industry and their global appeal, including for medical tourism, are now a well-researched topic (Radjou, Prabhu, and Ahuja, 2012; Govindarajan and Ramamurti, 2013; Ramdorai and Herstatt, 2015).

Reviews of published scholarly articles show that research on frugal innovation has been mostly carried out in the context of emerging economies, especially India (Prabhu and Jain, 2015; Tiwari, Kalogerakis, and Herstatt, 2016; Herstatt and Tiwari, 2017). A keyword analysis of peer-reviewed journal articles on frugal innovations showed that "India" was explicitly cited as a keyword in about 18% of all articles, while three other terms often associated with India ("Jugaad", "Bottom of the Pyramid", and "reverse innovation") accounted for another 56% (Tiwari et al, 2016). The business press also widely cites India as a pioneer source of affordability-driven innovations, referring them sometimes as "Indovations", whose impact extends beyond India's boundaries (see, e.g., Economist, 2009; Lamont, 2010; Bös, 2015).

3. Examples of Frugal Innovations from India with Global Success

As discussed in the previous section, frugal innovations have been often, even if obviously not exclusively, brought in connection with India. Many of the well-known examples of frugal innovations have been developed in India by domestic firms and affiliates of multinational enterprises (MNEs). Primarily targeted at the domestic market, several of these products have found commercial success also in international markets. In this section we showcase selected cross-industry examples of frugal products and services from outside the well-known case of the healthcare industry. These innovations have attracted international customers thus underscoring the lead market function of India in the field of frugal innovation.

3.1. Space Research

The Indian Space Research Organisation (ISRO) has recently emerged as a successful provider of commercial satellite launch services to global organisations (Lele, 2013; Prabhu and Jain, 2015). Antrix, ISRO's commercial arm, lists 209 satellites launched for international customers by June 2017 (Antrix, 2017). On 12 January 2018, ISRO launched another 28 international satellites from six countries (Economic Times, 2018) taking the overall figure to at least 237. Customers of Antrix include organisations from emerging market economies such as Algeria, Argentina, Indonesia and Turkey, as well as from industrialised nations such as the UK, USA, Germany and France (Antrix, 2017). Between 1999 and 2014, Antrix had launched only 40 international satellites, so the lion's share of launches have come after 2015. Most of the satellites launched by India on behalf of international customers can be classified as micro/lightweight satellites belonging to organisations such as universities and research institutions that are financially constrained. Frugal innovations have thus contributed to India's visibility and influence in the international space arena (Padmanaban and Tiwari, 2014).

3.2. Automotive

India has emerged as a global hub for affordable vehicles across different segments of the automotive industry (Tiwari and Herstatt, 2014; Tiwari and Phadnis, 2017). More than 30% of all small cars sold globally in 2014-15 were reportedly manufactured in India (IBEF, 2016). Multinational firms such as Daimler ("Bharat Benz") and Renault ("Kwid") have created well-known examples of frugal innovations in India. Especially, Maruti Suzuki's passenger car ("A-Star", sold as "Alto" outside India), Tata Motor's small commercial vehicle ("Ace"), Mahindra's sport utility vehicle ("Scorpio") and Hero's motorcycle ("Splendor") provide some excellent examples of frugal innovations that have been commercially successful in overseas markets. Mexico, South Africa, UK, Algeria and UAE were the top-5 destinations for exports of motor vehicles from India in 2014-15, followed by Italy, Nigeria, Saudi Arabia, Sri Lanka and Australia in that order (SIAM, 2016). The list of the top destinations signifies demand for Indian products from the developing as well as the industrialized world. The success of India's automotive industry with frugal products extends to the component industry, where several domestic firms and affiliates of multinationals (e.g., Bharat Forge and Bosch) have established credentials as global suppliers of excellent-yet-affordable components (Tiwari and Kalogerakis, 2017).

3.3. Fast-Moving Consumer Goods (FMCG)

In the FMCG arena, India has been one of the pioneers of frugal innovations, where multinationals such as Hindustan Lever and Procter & Gamble have created solutions aimed at dramatically increasing the affordability of quality products (see, e.g., Prahalad, 2004). Gillette's Guard razor was developed as "a transformational-sustaining innovation" with the strategic intent of providing "a cheaper and effective alternative" for millions of users that prefer double-edged razors and live in resource-constrained settings, e.g. without running water (Brown and Anthony, 2011). An especially interesting case is that of the firm Emami Ltd. that sells its antiseptic cream/Ayurvedic ointment ("Boro Plus") in Eastern Europe, Middle East and African countries at very affordable rates. To market its brand, the firm uses the appeal

of leading Bollywood stars such as Amitabh Bachchan, Kareena Kapoor and Kangana Ranaut, thus cashing in on the popularity of Hindi films in these regions (cf. Emami, 2018).

4. India as a Lead Market for Frugal Solutions

Lead markets are national markets which, primarily on account of the size of their domestic demand, access to technological capabilities, and embeddedness in the global economy provide key innovation impetus to a particular category of products (Tiwari and Herstatt, 2014). Innovations that succeed in a lead market generally also have reasonably good chances of succeeding in other markets (Beise, 2004). Examples of lead markets include Germany for premium automobiles and the United States for information technology (IT) products and services. The emergence and existence of lead markets was long considered to be restricted to the economically advanced countries with high international visibility and strong soft power (Beise, 2004). Recent research shows that developing countries, despite low per-capita income, can also acquire the role of a lead market if their demand-size enables significant economies of scale and they are endowed with the requisite technological and cultural capabilities (Quitow, Walz, Köhler et al, 2014; Tiwari and Herstatt, 2014). The lead market potential of a country depends on several mutually reinforcing factors (see **Figure 1**).

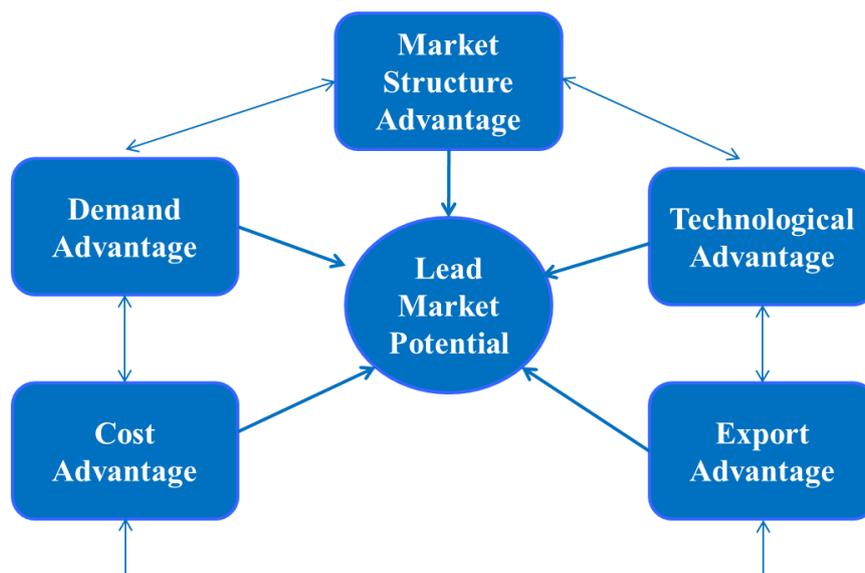


Figure 1: The 'lead market' model based on Tiwari and Herstatt (2014)

Market structure advantage exists when a value-chain network with sufficient depth is available in the country and there is enough competition to motivate firms to innovate. India scores fairly well on this front. Already, prior to independence, a domestic industrial base had emerged in the country that could capture about 75% of the market share and successfully compete with multinational enterprises in diverse fields (Chandra, Mukherjee, and Mukherjee, 2008).

Industrial policies adopted after independence restricted competition, stifling innovativeness in the process. However, since the process of economic liberalization was initiated in 1991, India has seen the emergence of healthy market competition. For example, India is today the seventh largest manufacturer of automobiles with several domestic and global players. There is a large base of supporting and related industrial firms across sectors. The country is now

home to a great number of active and successful entrepreneurs and is ranked 13th worldwide in terms of the availability of venture capital according to the Global Competitiveness Report 2017-18.

In terms of cost advantage, India remains a low-cost nation in international comparisons. As **Table 1** shows, India enjoys a significant cost arbitrage in the manufacturing sector (The Conference Board, 2016).

	India	China	USA	Germany
2012	1.59	3.07	37.71	42.42

Table 1: Average hourly compensation in manufacturing sector (in USD) in 2012

India’s cost advantage, which also builds on the sheer availability of skilled professionals, spreads across industry sectors and professions and is likely to remain “significant for decades to come” (Haddock and Jullens, 2009: 48).

Technological advantage emanates from the availability of the state-of-the-art technological infrastructure and access to tacit, first-hand knowledge (Tiwari and Herstatt, 2014). Ever since independence, India has continuously invested in creating and upgrading its technological capabilities (Herstatt, Tiwari, Ernst et al, 2008). Today, India boasts a significant domestic technology base with pockets of excellence, e.g., in information technology, chemicals and pharmaceuticals. The country has become a key player in the global sourcing market for engineering, R&D and product development services (NASSCOM, 2016). The experience of designing products for global companies and providing engineering and R&D services in cost-competitive settings has enhanced the innovative capability of the domestic industry. Indian companies have learnt to innovate within high resource-constraints (Radjou and Prabhu, 2012). On the flip side, even though India’s expenditure on R&D has increased significantly, the share of the corporate sector in the national expenditure on R&D remains low. Many firms are apt at producing incremental innovations that are “new to firm” but not really “new to world” (GOI, 2014).

India possesses a very significant demand advantage in the field of frugal innovations. It is the second most-populous country in the world with close to 1.25 billion inhabitants and a largely unsaturated market. As of 2011, the country was home to 247 million households, many of which continue to lack basic assets like refrigerators, televisions, telephones, computers and individual modes of mobility (GOI, 2012). The continuing economic growth creates immense consumption potential for frugal solutions in the country. Apart from standard, known solutions, this also presents an opportunity for disruptive, non-conventional frugal solutions. For example, many Indian consumers are traditionally cost-conscious and unwilling to pay for fancy packaging, forcing firms to be “very frugal with packaging due to cost considerations” (Bijapurkar, 2013: 287 f.). As a result, frugal innovations find a fertile ground in India due to socio-cultural and geographic conditions (Tiwari, 2017). India’s demand advantage in terms of its lead market potential is rooted in the similarity of these socio-environmental conditions to those in many other developing nations.

Finally, export advantage is generated when domestic demand has similarities to market conditions in target markets and the presence of an industrial base allows firms to export goods (or services) at competitive prices (Tiwari and Herstatt, 2014). At the same time, the

country should enjoy positive visibility in international arena to avoid negative country-of-origin effects (Kotler and Gertner, 2002). In the past 10 years or so, India has gained considerable reputation as a hub for affordable solutions as can be seen in the by-now large body of literature on frugal innovations (Govindarajan and Ramamurti, 2013; Prabhu and Jain, 2015; Herstatt and Tiwari, 2017). “[M]any aspects of Indian culture like music, food, style and religions have become fashionable” in various parts of the world (Blarel, 2012: 32), contributing to greater receptivity for products and services “innovated in India”. India is also benefitting from a virtuous cycle created by the deeper global integration of the economy (Celly, Prabhu, and Subramanian, 2013). According to UNCTAD (2018) data, the cumulative stock of outward foreign direct investments (FDI) by Indian firms at the end of 2016 stood at USD 144 billion; up from USD 0.1 billion in 1991. in case of inward FDI by foreign MNEs, the stock at the end of 2016 was about USD 319 billion, while it had stood at USD 1.7 billion in 1991. The greater global integration has helped open up new export avenues and reduced previously negative country-of-origin effects.

Table 2 summarizes the most important factors for the individual advantage groups at a meta-level based on a schemata proposed by Tiwari and Herstatt (2014: 191). It shows that India is endowed with an excellent lead market potential for frugal innovations.

Advantage	Factors	Endowment
Demand advantage	Size of domestic demand (B2C; B2B)	Very large
	Growth prospects (being an unsaturated market)	Very high
	Overall share of “frugal solutions” in the market	Very high
	Financial need for low cost of ownership (leading to less innovation resistance against frugal solutions)	Very high (GDP/capita \$1800)
Cost advantage	Possibilities to reap economies of scale	Very large
	Manufacturing costs	Low
	State incentives for frugal/affordable solutions	High
Export advantage	Significant cost arbitrage	Yes
	Similarity of demand with key target markets/ customer segments	Developing Asia, Africa, South America
	Embeddedness in international trade	Yes (WTO member)
	Overseas presence of domestic MNEs (as proxy for estimating overseas avenues of sales)	Outward FDI stock USD 144 billion
Market structure advantage	A large and competitive industry	Yes
	Strong base of domestic and global players	Yes
	Industrial base enabling localization of the value chain	Yes
Technology advantage	Availability of skilled professionals & Technical manpower	High
	First-hand, tacit understanding of customer needs/wishes in resource-constrained contexts	High
	A long-established R&D base of domestic firms	Limited
	Policy support for R&D	Yes
	Level of protection for IPR	Controversial/ improving
	Access to open global innovation networks	High

Table 2: A meta-level assessment of factors of lead market advantage

5. Concluding discussion: Projecting India's soft power through frugal innovation

Frugal innovation, by doing better with fewer resources and positively impacting more people, constitutes a powerful economic force for influence. Furthermore, frugal innovations also represent a cultural idea and a philosophy for growing in a sustainable, creative and inclusive way, which is extremely important to ensure global peace, food security and economic development as envisioned by SDGs. Such innovations are, therefore, not only important for developing countries like India and similar countries in Asia and Africa, where Indian frugal solutions in automotive, healthcare and education have already proven popular. They are also relevant for Western nations with increasing demand for, and recognition of, the importance of frugal innovations both as economic goods but also as a way of conducting economic activity and organising industry.

As has been demonstrated, several socio-cultural factors in India contribute to the increasing acceptance of frugal solutions on both the demand and supply side. India holds a unique position on the global stage in terms of creating solutions that can enable “affordable excellence” as the country has a large demand base, access to the requisite technological expertise through open global innovation networks, and a favourable export base. The Indian diaspora as well as India's cultural exports, such as yoga and Hindi films, have helped create a positive image for the country around the world (Wagner, 2010; Blarel, 2012) and have helped reduce previously negative country-of-origin effects. Therefore, both domestic and foreign firms are increasingly utilizing India as a testbed for their frugal solutions, which are then commercialized internationally in suitable, relevant markets. As the factors responsible for the acceptance of frugal products, services, business models and technologies (e.g., financial constraints, environmental concerns and the need for complexity reduction) are now found in many economies around the world, we presume that the demand for frugal solutions is only likely to increase globally. This demand is also expected to be propelled by initiatives such as SDGs and the increasing emphasis on social innovation in both developed and developing countries (Nari Kahle, Dubiel, Ernst et al, 2013; Bocken, Fil, and Prabhu, 2016).

According to Blarel (2012: 30), the economic development model pursued by a country may be regarded “as a soft power resource to the extent that its accomplishments prove attractive to others”. India possesses some advantages on this score on account of its credentials as a growing economy with a democratic system. Nevertheless, India and more specifically Indian firms have to do their homework to fully exploit the opportunity provided by frugal innovations. Blarel (2012: 33) has argued that India still needs to strengthen its position as “an inclusive and prosperous economic reference” to fully realize the potential of its soft power. Wagner (2010) also sees India as a natural but still-reluctant soft power not backing up its cultural leverage with the requisite diplomatic efforts. Even as India's economic and military capabilities grow, there is an increasing need for it to develop a soft power strategy that will give legitimacy and credibility to its leadership role in the world (Blarel, 2012). Frugal innovations can potentially provide a useful medium for a benevolent power that aims to promote peaceful coexistence, inclusive growth and prosperity around the world.

Indian firms (and policymakers) should not, therefore, become complacent about their existing businesses and fail to emphasize the importance of frugal innovation. They should retain their focus on creating customer value and not fall prey to the dominant logic of potentially wasteful, unsustainable and exclusive innovation approaches from the developed world. Namely, instead of focusing on delivering “more for more for few” they should continue to focus on delivering “more for less for many”. The demand for affordable and sustainable excellence is sure to grow globally and India can establish itself as a global soft power in the process.

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