



CHARMS OF 'FRUGAL+SHANZHAI' (B): A REVERSED PATH-DEPENDENT MODEL FOR DEVELOPING COUNTRY FIRMS TO CATCH UP

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Abstract

By conceptually re-iterating the transitional path from original innovation to imitation, this text is motivated to elucidate that, original innovation is not, and should not be treated as an exclusive privilege of those developed country firms or market leaders. Instead, it can also be birthed and used by those rapidly emerged developing country firms as their catching-up technique, both tactically and strategically. By presenting four case-studies, this text is tempted to elaborate the charms of 'Frugal+Shanzhai' framework (Zhao, 2019a), arguing that, as far as certain conditions are satisfied, 'Frugal+Shanzhai' can be applied as a innovation model facilitating developing country firms to produce competitive frugal products/services. The conclusion is that, 'Frugal+Shanzhai' is a reversed path-dependent catching-up model, forcing and reinforcing developing country firms to undergo a reversed-designing-engineering process initiated from the stage of Setting a Price-Cap prior to launching an innovation project, through the stage of using the Preset-Price-Cap as a mandatory guide to select the external sources for imitations and benchmarks, and then, to the stage of adopting a digital-mediated design-platform to simulate the designs and the 'trails and errors' on-screen, to provide front-loading problem solutions, to collaborate with the selected partners, to outsource the cost/risk-related factors and procedures as much as possible, and to minimize both costs and risks involved. 'Frugal+Shanzhai' also serves as a business model aligned with the principle of triple-bottom-line (TBL), facilitating developing country firms to build their competitive capabilities and advantages, and to ensure

their catching-up process. Lastly, strengths and weaknesses are discussed to make the 'Frugal+Shanzhai' framework not too far-fetched.

Keywords: Frugal, Shanzhai, Imitative-Innovation, Preset-Price-Cap, Path-Dependent, Digital-Platform, Reversed-Design, Catching-up, Benchmarking, Collaborating, Outsourcing, Cost-Reduction

INTRODUCTION

From Traditional Innovation to 'Frugal+Shanzhai' Imitative-Innovation

From the perspective of business environment evolution, it is unanimously believed that, the rapidly boomed and globalized information technology has dramatically boosted knowledge diffusion, changed global business environment, and stimulated the prosperity of many emerging economies (Ernst & Kim, 2002; Hariharan, 2005; Zhao, 2013; 2014; 2016; 2017). Of which, India (Jugaad: referring to Frugal) and China (Shanzhai: referring to Imitation) are perhaps the two fast-growing emerging economies benefited from the application of 'Frugal+Shanzhai', which is defined as a knowledge and technology based and also an Imitative-Innovation oriented path-dependent catching-up model, leading to the birth of many post-modern Asia-based industrial super-conglomerates, creating exemplars of an alternative path for developing country firms to catch up (Hagel & Brown, 2008), and supporting the theoretical framework hypothesized in this text that, 'Frugal+Shanzhai' can be qualified as an extension of the traditionally inherited Western-dominated innovation paradigm (Zhao, 2019a).

According to Jiangning Zhao, a professor dedicated to the research on Shanzhai, the China-way of doing business, the reversed path-dependent trajectory from '*Design-to-Price*' to '*Design-to-Cost*' constitutes the main characteristics of 'Frugal+Shanzhai' imitative-innovation model, differentiated itself from that of traditional innovation model in terms of 'Triple-A Technological Conditions', namely, there must exist an advanced innovation technology '*Available, Affordable, Applicable*', for developing country firms to imitate and benchmark. It is also stipulated that, developing country firms must be able to produce frugal products/services featured by 'Triple-Enough' characteristics, namely, cheap-enough in price, good-enough in quality, large-enough in volume, so that the frugal products/services can disrupt the existing but under-served markets (Zhao, 2019a). Aiming to elaborate such a theoretical framework, this text intends to present four typical case-studies, and to showcase how those newly emerged industrial stars from developing countries, have exercised the 'Frugal+Shanzhai' model to convey the charms of their 'Triple-Enough' frugal products/services, and to alter the traditional

way of catching-up, by capturing the needs and opportunities emerged from those existing but being overlooked/ignored or unserved low-end market segments, namely: the market massively populated by the consumer demographics of low-affordability. Admittedly, the validity and generalizability of 'Frugal+Shanzhai' framework as a combination of India Jugaad and China Shanzhai: are expected to be further explored, criticized, and polished.

Combination of 'Jugaad' and 'Shanzhai' Makes 'Frugal+Shanzhai' a Catching-up Model

The word 'Jugaad' is an Indian slang referring to 'frugal-innovation or frugal-way of doing businesses, and carrying a sense of pride, according to a professor at IIT (Indian Institute of Technology) during an international conference that, "the word implies the nation's traditionally inherited distinctive spirit of solving seemingly insoluble problems to make things done and never giving up". In comparison, the word 'Shanzhai' is also a Chinese slang, traditionally referring to 'anti-authority', contemporarily representing a spirit of 'If you can do it, then, we can do it too, regardless of whatever tricks and process it takes'. In a sense, both 'Jugaad' and 'Shanzhai' are cost-reduction-oriented ways of manufacturing and providing frugal-products/services, but differentiated from each other in terms of their respectively employed methodologies. 'Jugaad' is to get things done in a legally accepted way so to speak, such as simplifying or modifying the existing technologies or products without breaching the rules of IPR. In comparison, 'Shanzhai' embraces and pursues 'getting things done no matter the costs of others', resulting in the rampant imitation activities connived and instigated by the government economic reformation-policy, ubiquitously known as: 'white cat, black cat, catching the mouse is a good cat'. To this end, what 'Jugaad' stands for is basically still the Western heritage of market economy, reflecting Indian's British-colonial history; what 'Shanzhai' stands for however, is a post-modern political-economy system, striving to show off the omnipotent advantages of communism and socialism based impacts on economic development. It seems that, 'Jugaad' and 'Shanzhai' are mutually reciprocal and complementary to developing country firms' technological and managerial weaknesses, and that, the combination of the two, namely the proposed 'Frugal+Shanzhai' model in this text, may provide a distinctive contributions to the construction of catching-up model, both tactically and strategically (See Table 1):

Table 1: 'Jugaad' and 'Shanzhai' are Reciprocally Complementary Approaches to Cost-Reduction

1 st	<p>The 'Guanxi-based-network (personal-connection)' a post-modern business concept inherited from traditional Chinese political-economy system, has been indisputably interpreted as a key-factor contributing to the success of 'Shanzhai' supply-chain development (Zhao, 2013; 2014; 2016; 2017). When 'Guanxi' tactics is integrated into 'Jugaad' system to form the 'Frugal+Shanzhai' model, it will</p>
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facilitate firms to expedite their speed of gaining competitive capabilities and advantages in pursuing cost-reductions. When a solid personal relationship (Guanxi) with government officials is established, firms can make strategic decisions more preemptively and precisely aligned with government policies in a timely manner as to *'when and how'*, firms should downsize or expand their business operations, particularly in terms of order-fulfillment, production capacity and inventory controls. Li&Fung, a Hong Kong based company specialized in export business, is renowned as a pioneer of beneficiary relying on Guanxi-networked supply-chain comprised of 12,000 companies from more than 40 countries, to ensure its order-fulfillment, product-customization and quality-improvement. Similarly, Dachangjiang, a motorcycle-maker located in Guangdong province, is also reputed as a beneficiary of Guanxi-networked supply-chain of over a hundred domestic partners.

2nd

The application of imitation technique is defined as a key-factor contributing to the success of 'Shanzhai' cost-reductions, ensuring Shanzhai firms to produce cheap-but-good-enough products. Despite the endless debate between pros and cons over the legal and ethical aspects, the rapid growth of China Shanzhai-based economy during the past 40 years, has explained itself as a result of transitional-trajectory from imitation to innovation. The developmental path of Shanzhai mobile handsets from 'cheap enough' to 'good enough' may be used to elaborate the innovative progress incrementally improved one step at a time, from simple appearance imitation to make it look like, through a process of adding some exotically striking and appealing features and functions including but not limited to: solar chargers, super-loud speakers, telephoto lenses, ultra-violet lights that can be used to detect the forged currency, and watch-like, car-like or cigarette-packet-like mobile phones (having a real space for a few cigarettes) – all has clearly proved that, Shanzhai firms have accomplished in their own way, just as much genuine innovations as their so-called 'legitimate counterparts'. Therefore, integrating Shanzhai into 'Jugaad' system can make frugal products/services more frugal.

Table 1 explains that, 'Jugaad' and 'Shanzhai' are reciprocally complementary approaches to the purpose of cost-reduction, and that, the combination of the two contributes to the construction of 'Frugal+Shanzhai' model, which is a Guanxi-networked supply-chain operation in conjunction with an imitation-based collaboration, to jointly force and reinforce cost-reductions. Mindray (迈瑞) for example, is nationally known as one of the leading suppliers of cheap medical equipment, transformed from a pure imitator at its initial stage. Likewise, BYD, the king of imitation, has transformed into the world 2nd lithium-ion batteries producer, and reduced the global market price of lithium-ion batteries from \$40 to \$12 per unit by innovatively reducing the consumption of costly raw materials, and technologically changing the manufacturing conditions from expensively-designed and costly-heated 'dry room', to ambient temperatures, making BYD battery a globally recognized brand of triple-bottom-line product.

The Need to Conceptually Re-iterate the Transitional Path from Original Innovation to Imitation

The term 'original innovation' is defined as a synonymous with 'technological innovation', referring to the first-time application of science and technology in commercial practices (OECD, 1992), and emphasizing on the newness of the technological applications to market or industry (OECD, 1997). Such a definition seems to help differentiate the concept of 'original innovation' from that of 'imitation', indicating that, any none-first-time application of technology in product development is considered as 'imitation'. Accordingly, the capability of creating original products, new to the market, is differentiated from the capability of producing imitative products (Thomke, 2001; Thomke & Fujimoto, 2000). Such a definition seems to have dominated the mainstream of innovation literature, and may be metaphorically thought of a symphony, playing congruently the same old melody that: 'given their technological weakness, developing country firms have no choice but to arduously endeavor their efforts to imitate and absorb the emerging technologies from those original innovations, to accumulate their technological capabilities, competitive advantages, market credentials, and then, to transform from Imitators to Innovators'. Such a definition seems to be too stereotyped or clichéd trajectory to reflect the dynamic and prosperous roles of those fast-growing economies rapidly emerged from developing countries including but not limited to Asian Tigers, African Lions and Golden BRICS. The fact is that, more and more original innovations have indeed emerged through their booming process, but ignored by the traditionally inherited prejudice that, original innovation is a privileged game of the developed country firms, not the developing country ones (Zhao, 2013; 2014; 2016; 2017). Motivated and inspired to make a defensible argument that, original innovations can also be birthed by those developing country firms, this text presents four case studies to argue and elaborate the charms of 'Frugal+Shanzhai' model (Zhao, 2019a).

Frugal+Shanzhai: an Extension of Traditionally Inherited Innovation Framework

'Frugal+Shanzhai' is boldly termed in this text as an extension of traditional framework of innovation management, simply because it opens an easy-to-understand and feasible-to-practice management paradigm, derived and evolved from the increasingly globalized knowledge-technology oriented business environment. From process-control perspective, 'Frugal+Shanzhai' is defined in this text as an imitative-innovation oriented model, which is beyond a simple process of imitating originally innovated products. Instead, it is defined as a catching-up model for developing country firms to overcome their weakness of innovation capability, via the means of strategically outsourcing as much working process as possible, tactically modifying, substituting or replacing unnecessary components, and even

redesigning and/or restructuring the entire production processes. To this end, 'Frugal+Shanzhai' is proposed in this text as a feasible and profitable business model, forcing and reinforcing developing country firms to become able to maximally transfer the risks involved, maximally reduce the costs unnecessarily attached, while still able to maximally squeeze out a reasonable profit from the very limited price-markup-margin to serve and satisfy the needs of price-sensitive consumers at the mass-consumption markets such as health care, household utilities and communications. Such is the business mechanism supporting developing country firms to survive, grow and compete (Economist, 2010; Zhao, 2013; 2014; 2016; 2017).

From technological enhancement perspective, the application of 'Frugal+Shanzhai' imitative-innovation model can force and reinforce developing country firms to adopt the state-of-the-art design technologies such as digital-platform to simulate and imitatively change the architectural designs of the existing original components or even the entire products, so that the costs and prices of the finished products can be dramatically reduced, without changing the core concepts of original products, and especially without incurring high-degree risks (Ge & Fujimoto, 2004). It is suggested that, cost/price-reductions can be achieved by developing country firms both incrementally and radically. Simplifying the core concepts of original products is one way of reducing the costs of sophisticated R&Ds; substituting or replacing the raw materials of original products is another commonly adopted approach to pursue cost/price-reductions (Immelt et al., 2009). A typical example is the PC-based Ultra-Sound medical device developed by GE in China. By installing a software chipset, a laptop computer is turned into a key controller, by altering the original architecture design, a mini-and-portable Ultra-Sound device was imitatively and radically invented, only at a fraction of size, cost and price of the original device, serving the needs of mass-population crammed in those suburban areas. More and more similar innovations have been observed and witnessed as the results of frugal products/services, including but not limited to: Microwave oven (initiated by 'Galanz', a privately-owned Chinese firm), a simplified energy-saving microwave oven affordable for mass population (Christensen & Raynor, 2003); The Mini-washing machine launched by Haier (a privately-owned Chinese firm) was proudly termed by Haier itself as 'mini magical child', but sarcastically mocked as the imitation of 'concentric washing' technology. Notwithstanding, it has been consistently recognized and evaluated as an innovative washing machine, the size of only 1/2-3/5 of conventional ones, the cheapest, the energy-saving, and the noise-reduction, and the hot-selling household product in both domestic and international markets (Hang & Chen, 2008; Wang & Yang, 2008).

Frugal+Shanzhai: A Reversed Designing and Engineering Model for Cost-Reduction

Having 'Frugal+Shanzhai' framework defined as an imitative-innovation model, it is reasonable to stipulate that, benchmarking with original products (targets of imitations) in terms of costs and prices is mandatory. Therefore, preselecting the targets of imitation, presetting a price-cap, and working backwardly to benchmark the frugal products/services featured with 'Triple-Enough-Characteristic' with the preselected targets, is defined in this text as the reversed-designing-engineering process of 'Frugal+Shanzhai' model, which is also defined as a feasible cost-reduction model forcing and reinforcing developing country firms to gain and accumulate their competitive capabilities and advantages, to attract and solicit the low-end consumers with limited affordability and easy-to-satisfy preference. To this end, the 'Triple-Enough-Characteristic' not only determines the imitation nature of frugal products/services, but also determines the catching-up capability of developing country firms. Shanzhai products, especially the omnipresence of Shanzhai handsets (the imitated mock-ups of those hot-selling brands), are specifically designed to meet and benchmark with the preset price-cap. It is the imitation technique that has enabled Shanzhai firms to simplify or modify those branded handsets, and enabled Shanzhai phones to become competitive enough to break into the existing-but-unserved low-end markets (Zhao, 2013; 2014; 2016; 2017). When examining Shanzhai phones, in addition to their ultra-low price, some features and functions are impressively competitive, including but not limited to: easy-to-use flashlight (because of frequent power cuts in suburban areas); high volume of speakers (because of noisy environment of farmland and senior farmers' hearing barriers); multiple phone books (because of sharing the same phone by several family members); easy-to-access main menus (because of poorly educated suburban people) and so forth. These features and functions prove that, Shanzhai phones are not the results of simple imitation, and that, it is the innovation technique that makes them competitive in terms of price-to-performance.

The 'price-to-performance' has been historically applied as a managerial approach to win market competition. Motivated to reduce the unit price and to increase the total sales volume, Unilever and Procter & Gamble (P&G) have jointly formed an international consortium three decades ago, to encourage firms to pursue the frugal-way of trading business and to satisfy the preference of those disadvantaged consumers, such as selling shampoo and washing-powder in small packages rather than big ones. Such a simple change in product packaging-design helped and enabled P&G to cater for those customers with cramped living spaces and limited budgets. By changing product-design, Nike launched an 'all-enveloped athletic uniform' specifically tailored for Muslim women athletes, and won Nike an innovation reputation. Comparatively, GE and TCS have accomplished something more exciting than just

fiddling with existing products. Instead of conventionally inherited way of adding more and more fancy accessories to enhance products' selling points, GE (portable ECG device) and TCS (simplified water purification device) had preset a price-cap as their starting point respectively, to reversely or backwardly pursue their cost-reductions, by stripping their products down to the very essential features and functions, so that the preference of those price-sensitive consumers at the low-end markets can be satisfied.

External and Internal Conditions for Adopting and Implementing 'Frugal+Shanzhai' Model

Some scholars contended that, on the firm level, the transformation from imitation to innovation represents the process for developing country firms to upgrade their internal capabilities (knowledge, technologies and experiences) required to gain catching-up capabilities (Arrifin & Fugueiredo, 2004; 2006; Chang, 2008; Liu, 2005; Mu & Lee, 2005; Shenkar, 2010; Zeschky et al., 2011). It is also argued that, upgrading internal capabilities alone may not necessarily bring about sufficient competitive capabilities for developing country firms to catch up with those market leaders if certain external conditions are absent (Forbes & Wield, 2008; Luo & Tung, 2007; Luo et al., 2011). 'Frugal + Shanzhai' proposed in this text is not only the most distant innovation model from the existing ones, but also stipulated that, only when certain conditions (external and internal) are satisfied, can developing country firms become able to pursue such a distinguished innovation model, and to build their competitive capabilities and advantages accordingly (See Table 2):

Table 2: Conditions for Adopting and Implementing 'Frugal+Shanzhai' Business Model

External Conditions	An existing-but-unserved low-end market large-enough in size must exist; an advanced technology must exist, and must be <i>available, applicable and affordable</i> for developing country firms to use as the source or target of imitation, so that the <i>cheap-but-good-enough</i> frugal products/services can be benchmarked with and differentiated from those expensively priced brands.
Internal Conditions	Firstly, firms must be able to leverage as much resources (both external and internal) as possible to ameliorate, reduce and/or circumvent cost-related factors; secondly must be able to take the risks rendered from presetting a price-cap as an initial concept to launch a frugal innovation project, which is a reversed-designing-engineering process from 'designing-to-price' to 'engineering-to-cost'.

Table 2 indicates that, when and only when developing country firms become strategically and tactically able to identify and capture the emerging business opportunities, to assimilate and

leverage external resources, they can dynamically obtain and continuously accumulate their internal capabilities required to constitute their competitive advantages (Ray & Barney, 2004). For example, Heart disease and contaminated water have been the long-existing public healthcare problems in India, in which, more than 5million people die of cardiovascular diseases annually, more than 2million people die from drinking the contaminated water annually. No action was taken whatsoever prior to the involvement of GE (General Electric) and TCS (Tata Consultancy Services). The two identified these public needs, turned them into business opportunities, and created a win-win-win business model respectively in a timely manner, by designing and producing cheap and simplified versions of the two devices, namely: portable electrocardiogram (ECG) by GE, and bacteria-free edible water purifier by TCS.

Four Approaches of ‘Frugal+Shanzhai’ Model Driving Developing Country Firms to Catch up

Note that, ‘Frugal+Shanzhai’ is not a simple imitation model. It involves rethinking and restructuring the entire process of business operations in order to maintain and improve the price-to-performance and simultaneously squeeze profits out of the increasingly compressed margins. It is suggested that, given the technological weakness, managerial way of remodeling business operations is likely to play a more feasible role than technological applications (imitations) for developing country firms to pursue their catching-up processes, and that, the ‘preset-price-cap’ oriented ‘Frugal+Shanzhai’ is recommended as the best-practice to catch up, both strategically and tactically (Zhao, 2019a). By presetting ‘\$2500’ as the price-cap prior to actually launching the Nano Project, Tata Motors has successfully created the cheapest passenger car, and radically changed the history of auto-industry. Similarly, presetting a price-cap has enabled Godrej & Boyce, one of India’s oldest industrial groups, to have developed a mini-fridge (known as ‘the little cool’) running on batteries at the price of under \$70. A preset-price-cap has enabled Anurag Gupta, a telecom-entrepreneur, to have downsized the banking transaction process to a single smart-phone linked with a fingerprint scanner, and functioned as a portable ATM machine to serve those distanced remote rural areas. Numerous successful catching-up examples can be attributed to the adoption and implementation of ‘Frugal+Shanzhai’ model, which is constituted by the four managerial approaches (refer Table 3).

Table 3: Four 'Frugal+Shanzhai' Approaches Facilitating Developing Country Firms to Catch up

1 st	<p>Creating the prototype of frugal ideas should be prioritized as a routine to guide developing country firms to search for existing technologies that can be imitatively simplified and modified. Given the reality that, personal computers are relatively rare in India but televisions are ubiquitous, TCS captured this market opportunity, designed a box to connect televisions with internet via a mobile phone. With a remote-controller in hand, those rural people without prior experience of surfing the web through PC-keyboards can now easily enjoy the virtual-world provided through internet technology. Such a novel idea of reconfiguring the existing technologies and products (networks, televisions and mobile phones), has served to improve the life quality of millions people, allowing them to enjoy the TV-shows, and simultaneously, dial or receive any phone calls. Needless to mention the cost-reductions generated from the saved resource-consumptions.</p>
2 nd	<p>Identifying and capturing the needs of the unserved or under-served markets should be taken as the marketing strategy, guiding developing country firms to design their Frugal products/services. GE portable ECG device and TCS water purification device may be used as typical examples to explain how they have achieved their respective successes by capturing the ever-increasing needs of health care markets.</p>
3 rd	<p>Adopting the state-of-the-art digital-design platform should be mandated in order for developing country firms to technologically achieve the capability of front-loading problem-solutions. By simulating 'trials and errors', and by 'think-play-do' type of on-screen digital-design process (Dodgson et al., 2005), alternative solutions can be tested and established prior to actual production investment, and consequently, turning cost-reduction as a result of hassle-free natural flow (Thomke, 2001; 2003; Thomke, 2006). 3D-CAD is just one, among many others, widely applied digital-design platforms.</p>
4 th	<p>Applying 'outsourcing strategy' should be considered an effective way for developing country firms to transfer risks, and pursue cost/price reductions. The rule of thumb is to outsource as much cost-consuming process to contractors as possible. Bharthi Airtel, an Indian multi-billion dollars mobile communication company, has contracted out almost everything except the core business of selling phone calls. To make this work, Mr. Bharthi (the founder) convinced his board of directors, especially those external investors and partners, to agree for business model reconstruction. For example, Ericsson had to agree to accept a service-based payment by minute, rather than by a lump-sum charge of selling and installing its equipment; rival companies had to agree to rent towers rather than possessing the outright of ownership. Such a business model reconstruction helped Bharthi Airtel to transfer those major risks and costs, by handing over its network operations to Ericsson, its technical support service to IBM, and its management of transmission towers to an independent company. Consequently, Bharthi Airtel had achieved its cost-reduction and profit-maximization.</p>

Table 3 indicates that, 'Frugal+Shanzhai' model is beyond a simple technological imitation or innovation. The four 'Frugal+Shanzhai' techniques can be used to facilitate developing country firms produce frugal products/serves, which not only enable them to pursue their catching-up process, but also force and reinforce their business operations to be aligned with the principle of triple-bottom-line strategy.

OBJECTIVES, METHODOLOGIES AND SIGNIFICANCE OF THE RESEARCH

Organizational capability-building is determined by firms' internal ability of leveraging external resources to optimize production-processes for value-creation (Christensen & Overdorf, 2000). Given their weaknesses of internal ability, it makes sense to showcase and rationalize how 'Frugal+Shanzhai' model has been deviated or diverged from traditionally inherited 'late-comers-strategy', namely: 'following the footprints of market leaders and do as told', and used for developing country firms to develop their catching-up capabilities. For this reason, 'Frugal+Shanzhai' is also defined in this text, as a post-modern and anti-traditional approach to deal with or harness resource-deficiency problems. It is suggested that, exploratory case-study is methodologically more convincing than other research approaches in terms of sense-making (Yin, 1994; 2009). Guided in this direction, by organizing and combining archival data with data distilled from interviews and web searches, and by delving into a process of on-desk-analysis, the author of text attempts to explore and disclose the mechanism of how 'Frugal+Shanzhai' can serve as a competitive business model, facilitating developing country firms to survive, grow and catch up.

CASE-STUDIES: 'FRUGAL+SHANZHAI' MODEL FACILITATING DEVELOPING COUNTRY FIRMS' CATCHING-UP

To defend the theoretical framework proposed in this text that, 'Frugal+Shanzhai' can be used as an effective and competitive business model, to facilitate developing country firms to gain and accumulate their catching-up capability, four case-studies are selected and illustrated in this section, endeavoring to make this framework not too far-fetched to face future critiques in terms of validity and generalizability.

Case 1: General Electric Healthcare Laboratory (Bangalore) Frugal Innovation Product (Portable ECG)

The healthcare laboratory of General Electric (GE) located in Bangalore India is famous for having a few remarkably sophisticated equipments innovated for healthcare examinations, from the latest technology-based-scanners suitable for adults' diagnosis, to the state-of-the-art intensive-care devices to nurse the premature babies. The most impressive device capturing the global market attention, especially those developing markets, is its locally developed cheap and portable electrocardiogram (ECG), named as 'Mac 400'. Such an innovative frugal product serves for Medicare Personnel to carry the device on their shoulder, providing services to those low-income people, residing in those remote suburban areas and unable to afford the cost of transportations to urban hospitals.

The 'Mac 400' device may be characterized as a masterpiece of modifications and simplifications including: reducing the multiple buttons on conventional ECGs to just four buttons; reducing the size and weight of bulky printer on conventional ECGs to the size and weight of a portable ticket machine, flexible for both batteries and mains, small enough to fit into a backpack and carried around on the shoulders of Medicare Personnel. The 'Mac 400' device is such a frugal product, according to Mr. Ashish Shah, the CEO of the laboratory, not only technologically self-explaining its leading position, but most importantly, highlighting the significance of managerial innovation, since it is the idea of modifying and simplifying the original ECG machine, making it smaller and cheaper, reducing the conventional price dropped from \$2,000 to \$800 per unit, and accordingly, reducing the price of ECG test from about \$10 to just \$1 per patient. For these reasons, the 'Mac 400' device is qualified to be not only a frugal innovation product, but also a triple-bottom-line (TBL) based product, serving to benefit economy, society, and environment.

Case 2: Tata Consultancy Services (TCS) Frugal Innovation Product (Water Filter)

Mr. Ananth Krishnan, the chief technology officer (CTO) of Tata Consultancy Services (TCS) located in Chennai India, foresaw the potential market demand for simplified and cheaply priced water-filter device. Sitting in his office, he starts to ruminate how to initiate such a low-tech, easy-to-install but profitable innovation project. What in his mind is to have the device designed to utilize the rice husks (one of the vastly wasted side-products) to purify edible water. The device is expected to be not only robust in quality and profitable for TCS, but also reasonably affordable for the averagely large-in-size families in India. Considering the abundant market demand for bacteria-free edible water, the consuming price of utilizing this device must be calculated and counted on daily base in order to make it convincing, a win-win-win plan has eventually become practically feasible, economically profitable, end-user affordable, namely: the initial investment of \$24 one-time installation fee, and thereafter, a recurring expense of only about \$4 for a new filter replacement in about every 2-3 months.

Having such a pre-determined quality of product in conjunction with a preset price-cap pondered over and over again in mind, Mr. Ananth Krishnan established a firm confidence on such an idea of frugal device, and went on to convince the board of directors. Shortly after, this frugal project was assigned to Tata Chemicals, setting the goal of producing and providing 1million units per year and incrementally increasing its productivity to satisfy the needs of 100millions customers over the next few years.

Case 3: Frugal Innovation Model for Hospital Business Development and Management

This case is to demonstrate the successful effect of gaining competitive advantages by targeting at the existing but under-served market segment, and by leveraging the combination of economy of scale and brand-building of professional specialization. Motivated by providing affordable medical services to the economically disadvantaged group composed of India's mass population, Dr. Devi Shetty – the India's most celebrated heart surgeon, who performed the country's first neonatal heart surgery on a nine-day-old baby, who is honorably memorized among his patients as 'Mother Teresa', and most importantly, who is also reputed as the most successful frugal business entrepreneur to apply Ford's management principles – has not only established the India's first privately-owned hospital dedicated to serve low-income people, but also generated a positive impact on efficiency management of the nation's medical service industry.

Economy of Scale and Specialization-based Brand-Building Leads NHH to Frugal Advantages

Dr. Devi Shetty believes that, the combination of pursuing economy of scale and enhancing the reputation of professional specialization can not only facilitate brand-building and promotes the development of competitive advantages, but also radically reduce the cost and price of service business especially in medical service industry. His flagship Narayana Hrudayalaya Hospital (NHH) located in Bangalore provides 1000 beds, nearly ten-times of an average of 160 beds in American heart hospitals. Dr Shetty and his team of 40 cardiologists perform an average of 600 heart surgeries per week. Such a sheer number of patients allow Dr Shetty and his team to acquire and accumulate world-class expertise and experience from practices. Dr Shetty has performed more than 15,000 heart operations in total, and other members of his team more than 10,000 on average. An average charge of only \$2,000 per open-heart surgery in NHH makes it sharply contrasted with a price-range of \$20,000-100,000 in American hospitals, and an equivalent rate of surgery success comparing with those top-notch American hospitals, together they have earned NHH an indisputable market reputation, which is deemed an outcome inseparable from the adoption and implementation of a highly efficient and effective management system at NHH.

Maintaining a Professional Management Team Ensures NHH to Sustain Frugal Advantages

Having a highly trained 'Henry Ford's Lean Principle' oriented management team maintained at NHH has ensured its surgeons to concentrate on their specialty rather than wasting time on

administration. Dr Shetty has devoted much of his time and energy to boost his customer base, largely because of his belief that, higher volumes lead to better quality and vice versa. Such a business vision has enabled NHH to have achieved three frugal-advantages (See Table 4):

Table 4: The Three Frugal-Advantages Achieved and Sustained
at Narayana Hrudayalaya Hospital

1 st	Implementing an internet-based cutting-edge audio and video network system, linking NHH with remotely distanced hospitals in India, Malaysia and partners in Africa; providing a virtual platform for NHH surgeons to contribute their expertise to advise those less-experienced surgeons elsewhere, resulting in profit-gaining and enhancement of NHH reputation, without increasing the costs of business operation.
2 nd	Implementing a ‘clinics-on-wheels’ dispatch system, enabling NHH to send specialists to rural hospitals to test for heart disease; Implementing a health-insurance scheme by collaborating with local insurance firms, enabling low-income people to be covered for a premium of about 11 cents per person and per month.
3 rd	Implementing a sliding-and-fluctuating payment system, enabling NHH to charge a higher rate from richer patients and to provide subsidies to poor ones; Such a differentiated scaling system enabled NHH to attract not only an increased volume of patients, but also a steadily increased financial profit. According to NHH financial report, it has sucked in an average of 7.7% after-tax profit annually, a sharp contrast with an average of 6.9% in American private hospitals.

As noted in its report, NHH has expanded from a family-owned hospital specialized solely in heart disease, to a hospital specialized in both heart and eye disease; from a hospital only providing surgeries, to a hospital grouped with clinics, laboratories and blood banks, located in different parts of the country. According to Dr Shetty vision, NHH group will continue to expand, and to increase its number of beds to 30,000 in five years, making NHH the largest private-hospital group in India, enabling NHH to gain greater bargaining power when negotiating with its suppliers, while still continuing to reduce their service prices, and continuing to drive down the overhead cost of its entire business operations.

Case 4: Tata Nano Car and its Radical Innovation Oriented ‘Frugal+Shanzhai’ Model

As a new-to-the-world compact, two 623cc-cylinders, rear-wheel drive, and multi-point fuel-injection petrol engine with maximum speed of 105 km/hour, Tata Nano-Car represents the most impressive classic example, earning itself the world-class competitive advantages in terms of cost, price and market share (Chacko et al., 2010). For this reason, Nano-Car is described as the ultra-low-cost-car, creating a new category of the world passenger cars, and leading the

dynamic trend of global auto-market (Rahman, 2008). Three characteristics can help rationalize that, the success of Nano Project should be attributed to the implementation of the 'Frugal+Shanzhai' imitative-innovation model (See Table 5):

Table 5: Three Characteristics Rationalizing Nano Project
as a 'Frugal+Shanzhai' Imitative-Innovation

1 st	<p>Presetting a price-cap and targeting at unserved but fast growing low-end market crammed by low-income customers is set to be the starting point to confine the prototype design. Called upon the motivating and mandatory speech of Mr. Ratan Tata, Chairman of Tata Group, at the unveiling ceremony of the 'Nano Project': it is time to end the history of 'families riding on a two-wheelers, the father drives a scooter with one kid standing in front of him, his wife sitting behind him holding a baby' (Economic Times, 2008; 2009; TML, 2008b; 2010b). Nano Project is to produce cars at the first-to-the-world price-range (\$2,500-\$3,000), aiming to force the two-wheelers to retire from the street of India (Kearney, 2008; 2009; Meredith, 2007).</p>
2 nd	<p>Adopting reversed-designing-engineering-techniques to examine existing economic cars, and to imitate and benchmark with them, forcing and reinforcing a reversed process from 'design-to-price' to 'design-to-cost'.</p>
3 rd	<p>Breaking-all-the-rules is set as the principle of 'Nano Project'; outsourcing and collaborating with external partners are set to be the tactics of costs/risks reductions, and the strategies of breaking traditional concept and architecture, including but not limited to the designs of two-cylinder gasoline engine (positioned under the rear seat to save space), transmission, body, chassis and a single balancer shaft (TML, 2010a; 2010b).</p>

Company Background: The Transformation of TML from OEM to Nano Brand

TML (Tata Motors Limited), founded in 1945 and evolved as the largest OEM of utility vehicles and passenger cars in the auto-industry of India, is a child-company of Tata Group, which is the largest multinational conglomerate in India, with 22,000 employees and 70.8 billion dollars in revenue in 2009 (Palepu et al., 2010).

As an OEM of Daimler-Benz, TML began manufacturing commercial vehicles in 1954, launched its independently manufactured utility vehicle in 1991, and engaged in manufacturing passenger cars in 1998. By releasing its own brand 'Indica', the first India's indigenous car, TML has earned a best-selling record of indigenous brand. In a three-year period (1998–2001), 100,000 Indica were sold, and 200,000 in 2002 (TML, 2010a; 2010b), providing TML with a solid financial and technological capabilities, escalating TML's ambition of innovation, resulting in the successful release of a series of indigenous brands such as the Indigo, launched in 2002, and the Indigo Marina in 2004, both are regarded as derivative models of Indica (Rajurkar et al.,

2006). '1 million' passenger cars were sold in 2005, '4 million' total sales of both Nano-commercial and Nano-passenger in 2006 (TML, 2010a; 2010b) turning Nano-brand worldwide known, ranking Nano commercial-vehicle as the first, and Nano passenger car as one of the top-three in terms of their domestic market shares respectively (Economic Times, 2008; 2009; 2010; Financial Express, 2008; JD Power, 2010).

The Path-Dependent Trajectory: from Three Tactical Techniques to Three Strategic Advantages

TML had experienced a history of developing low-cost vehicle long before launching its Nano project. The Ace Mini-Truck Project was initiated in 2000, completed in 2005, and recognized as the first indigenously developed and manufactured cargo-carrying commercial vehicle, also priced as the cheapest and ranked as the hottest-selling Mini-Truck in India in between 2009-2010 (Chacko et al., 2010), deadly striking or disrupting the then India's three-wheeled auto market (Meredith, 2007). Coincidentally or not, Mr. Girish Wagh, a 37 year-old Nano Project manager from 2005 on, was also involved in the design of the Ace mini Truck. Leading a team of 500 indigenous and inexperienced engineers aged between 25 and 30, and in order to kick-off Nano Project from scratch, Mr. Girish Wagh had no choice but to hire different groups of world-class foreign technicians to be the on-sight consultants and/or advisors.

According to Mr. Girish Wagh, the major components of Nano-Car were either designed or modified by foreign companies, and the success of Nano Project should be irrefutably attributed to its path-dependent trajectory from the applications of three tactics, to the achievement of three strategic advantages, namely: (1) from tactically presetting a price-cap prior to the launch of Nano Project to force and reinforce a reversed-process from 'design-to-price-cap' to 'design-to-cost' and then, to the strategic advantage of costs-resources-reductions; (2) from tactically adopting the digital-design mediated platform to jointly simulating the trials-and-errors on-screen), which is termed as front-loading problem solutions (Agrawal & Wadia, 2008; Kripalani, 2008a; TML, 2008b; 2010a; 2010b), and then, to the strategic advantage of costs-risks-reductions; (3) from tactically outsourcing the risk-involved designs to the selected value-adding external partners, to the strategic advantage of costs-risks-transfers. The three tactics serve as the preemptively and sequentially staged procedures (Kim, 1980), forcing and reinforcing Nano Project to be confined to the preset-price-cap, and consequently ensuring the strategic advantages of costs, resources and risks reductions (See Table 6):

Table 6: The Path-dependent Trajectory from Three Tactical Techniques to Three Strategic Advantages

From the Tactic of Presetting a Price-Cap to the Strategic Advantage of Costs-Resources-Reductions:

1st From the moment of '\$2,500-\$3,000' price was stochastically popped out and ambitiously announced by Mr. Ratan Tata, the preset-price-cap was established as an uncompromised bottom-line to confine or restrain the development of Nano Project (Agrawal & Wadia, 2008). Such a price-cap preset by the ultimate decision-maker forces and reinforces a reversed process from 'design-to-price' to 'design-to-cost' without incurring otherwise a normally encountered organizational turmoil in terms of risks and responsibilities. According to Mr. Ravi Kant, one of the project managers, the preset-price-cap had served as a mandatory principle that, any designs exceeding the price-cap must be canceled and re-designed (Palepu et al., 2010), and that, finding alternative concepts and benchmarking the expected target-cost and target-performance with the existing ones, must be taken as daily routines and tasks of every member of Nano Team and external partners, just to avoid or reduce risks jeopardizing the goal of preset-price-cap (Kripalani, 2008a). Note that, right after the preset-price-cap announced, it was sarcastically joked as a 'half car' or something like four-wheeled scooters. In response to this sarcasm, Mr. Ratan Tata explained during an interview with Economic Times that, the mission of Nano Project is designated to turn the 'half car' into a properly functioned passenger car (Economic Times, 2008). Motivated by this price-cap, Nano Team, after a wild search for alternative concepts, selected Maruti Suzuki 800 (produced by Indo-Japanese firm) as the source of Nano-Design imitations and benchmarks, to initiate its reversed-designing-engineering process of cost-reduction (Chacko et al., 2010). As a result, Nano Team was forced and reinforced to eliminate, modify and simplify those none-value-adding features and functions, for example: one mirror replacing two, single wiper replacing two; plastic components replacing metal ones, removing air-condition, radio, power-steering and so forth, leading to a record-breaking-success of cost-reduction in the history of automobile industry (Ito, 2008; 2009).

From the Tactic of Digitally-Mediated Design Platform to the Strategic Advantage of Costs-Risks-Reductions:

2nd The application of 3D-CAD/CAM digital-design platform enabled Nano Team to take advantage of 'play-think-do' process of on-screen trials and errors, to avoid or reduce the costs imbedded in the traditionally physical-investment oriented experiments, and to ensure Nano Project confined to the preset price-cap. It is reported that, if without the application of the state-of-the-art digital aids, Nano Project would not have accomplished its preset price-cap (Khedkar, 2008; USSEC, 2008). In light of digital-design advantages, it is argued that, digital-design platform has served as a front-loading problem-solution (Thomke, 2001; Thomke & Fujimoto, 2000), forcing and reinforcing Nano Team to strip down those unnecessarily cost-related factors on-screen, rather than physical investment, so that the procedures of technological validations, mechanical simplifications, and managerial integrations could be accordingly accomplished and linked with PLM with ERP systems digitally (Sale, 2011). The digital process of Nano Project is also described as an imitation-oriented learning, designing and planning process, simulated and executed in a

cyberspace prior to the actual investment (Tata Technologies, 2010; 2011; The Times of India, 2008). It is argued that, the application of digital-design platform enabled Nano Team to have achieved over 40 patents ranging from concept-design to architecture-design (Gupta & Sriram, 2008). According to Mr. Ravi Kant, the application of digital-design platform had served as a Front-Loading Problem Solution platform, forcing and reinforcing Nano Team to take on a preventative routine task of checking and identifying unnecessary cost-related risks resulting from possible failures of product designs, tests and manufacturability.

From the Tactic of Outsourcing to the Strategic Advantage of Costs-Risks-Transfers:

3rd

It is reported that, collaboration with External Partners and Application of Outsourcing Strategy are the two contributors determining the success of Nano Project in terms of Cost-Reductions (Business Wire, 2010). According to Mr. Harris, the CEO of INCAT (a British owned and world leading engineering company with 3000 employees), and later the CEO of Tata Technologies after INCAT being acquired by Tata group in 2005 that, the success of Nano Project is inseparable from collaborating with and outsourcing the core-designs to INCAT, which helped Nano Project to set up the master digital mock up systems (Treece, 2008; Mahindra, 2008), and without which, Nano Project would be neither able to achieve its integration of PLM, ERP and CRM systems into the frugal design, nor able to accomplish its goal of the preset-price-cap (Tata Technologies, 2010). Of the total original components, only 15% was the results of in-house innovation; of the 85% outsourced original components, 70% was outsourced to foreign firms, and 30% to local firms (Gopalan & Mitra, 2008). These numbers may directly or indirectly indicate that, Nano Project was initiated without independently sufficient in-house technological capability, and that, without collaborating with external parties, the success of Nano Project would have been substantially discounted. By providing a roughly sketched component, more than 100 parties throughout the entire Nano supply chain, especially those design partners such as Dassault, Siemens, Bosch, were activated to engage in the collaboration of component innovation, instigated to maximally exercise their respectively accumulated experiences (Chacko et al., 2010; Palepu et al., 2010), and exclusively guided by the preset-price-cap, to remove or modify those none value-adding but cost-involved components (Agrawal & Wadia, 2008). According to Mr. Ravi Kant, among the 100 selected partners, the most noteworthy contributor in the pursuit of the preset price-cap is Munro & Associates, a US-based consulting company specialized in Lean-Design, being invited with a one-year (2006-2007) consulting contract. It is estimated that, Munro & Associates has contributed to more than 10% of total cost-reductions, mostly by ameliorating and/or modifying the unnecessary designs of engine, transmission, suspension, steering, and interior settings (Kripalani, 2008a).

Table 6 illustrates a path-dependent trajectory from the adoption of three tactical techniques to the achievement of three strategic advantages, indicating that, the success of Nano Project deserves to be recognized as an original or smart-way of imitative-innovation, resulting in some

major concepts and designs of components to be radically changed, modified and/or simplified, including but not limited to: engine, power train, drive shafts, clutch and axle, transmission, electronic sensors, brake system, body style and chassis and so forth. Comparing with the architecture design of Maruti Suzuki 800 (three-cylinder-engine car, preselected and determined as the target of imitation for Nano Project to benchmark), the finished Nano-Car officially completed in July 2006, had featured a number of distinguishable differentiations such as rear-seat-positioned 'two-623cc-cylinders engine', space and weight savings, and about 25%-30% of cost-reductions and material-consumption reductions (Gopalan & Mitra, 2008; Palepu et al., 2010).

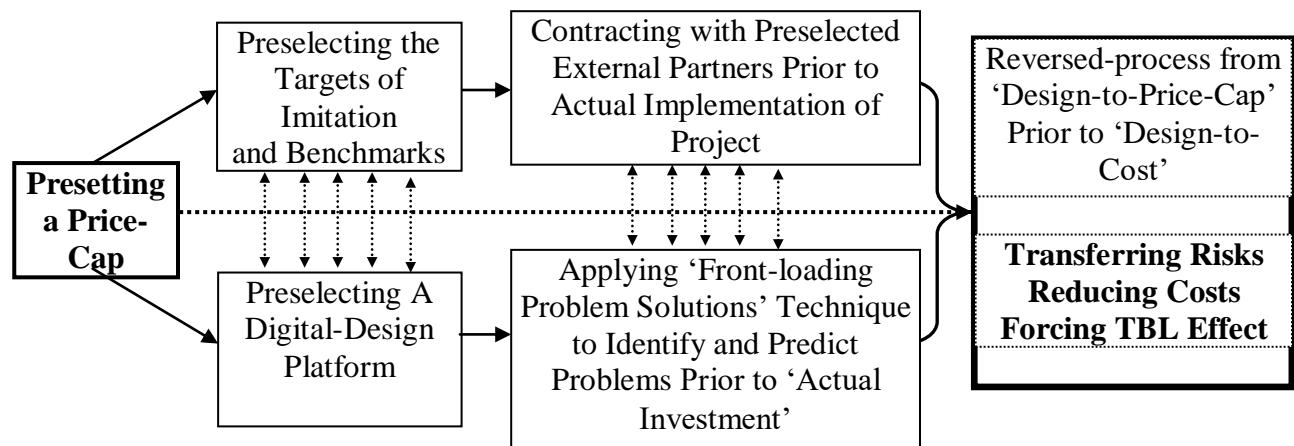
CONCLUSION: 'FRUGAL+SHANZHAI' IS A PATH-DEPENDENT CATCHING-UP BUSINESS MODEL

This text concludes that, 'Frugal+Shanzhai' can be qualified as a path-dependent innovation model facilitating developing country firms to catch up. The four case-studies presented in this text may prove that, 'Frugal+Shanzhai' can be used as an efficient and effective business model, facilitating developing country firms to cultivate their organizational capabilities, to gain their competitive advantages, and to pursue their catching-up processes (Economic Times, 2008; 2009; 2010). To this end, attributing the successes of those developing country firms to the results of implementing 'Frugal+Shanzhai' model is not a too far-fetched theoretical argument.

From the adoption and implementation of the three tactical techniques (presetting a price-cap, applying the state-of-the-art digital-design platform, collaborating with and outsourcing the costs/risks related to factors to external partners), to the achievement of the three strategic advantages (resource-savings, cost-reductions, risk-transfers), determines and features the path-dependent and catching-up mechanism of 'Frugal+Shanzhai' model (See Table 6). Together, these sequentially and causally related tactics and strategies constitute the feasibility and competitiveness of 'Frugal+Shanzhai' model, forcing and reinforcing developing country firms not only capable of catching-up, but also capable of complying with the principle of Corporate Social Responsibilities, or the principle of Triple-Bottom-Line (See Figure 1).

Figure 1 illustrates a flowchart of 'Frugal+Shanzhai' model, a reversed process, moving backwardly from design-to-a-preset-price-cap prior to design-to-cost. Such a reversed process helps firms to maximize their internal capabilities required to leverage external resources (both technological and managerial), and simultaneously to minimize the costs and risks involved in the process of producing frugal products, cheap-enough in price, good-enough in quality, and attractive enough to take advantage of economy of scale to win market competition.

Figure 1: 'Frugal+Shanzhai' as a Reversed Path-Dependent and Catching-up Business Model



Rationalizing the Reversed Path-dependent Mechanism: from 'Design-to-Price' to 'Design-to-Cost'

The framework of 'Frugal+Shanzhai' Model proposed in this text stipulates that, presetting a price-cap must be used as a mandatory guideline to force and reinforce the execution of a reversed-designing-engineering process, which in turn ensures that, any cost of design exceeding the preset-price-cap must be considered as a risk, and must be eliminated or re-designed. The application of digital-design platform jointly established by the carefully selected partners or collaborators, forces and reinforces them to identify and simulate potential problems on-screen, to take it as an approach of 'front-loading solutions', and consequently, the identified problems can be avoided or eliminated digitally prior to actual investment, resulting in the traditionally inherited wasteful experiments obsolete.

The reversed path-dependent mechanism of 'Frugal+Shanzhai' model can be applied for the purpose of both incremental innovation (see case 1 and 2) and radical innovation (see case 3 and 4). NHH and Nano-Car may be recognized as typical cases of radical innovations, radically changed the traditional way of doing business simply by setting a 'price-cap' as the central idea of innovation. Hence, it is reasonable to hypothesize that the newness of the preset-price-cap (the distance from the selected price-benchmarks) determines whether the 'Frugal+Shanzhai' is an incremental- or radical- innovation. The far-distanced preset-price-cap, like the ones achieved in the cases of NHH and Nano Project, should be considered as radical innovations, otherwise incremental. Another hypothesis is that, 'Frugal+Shanzhai' may serve as an innovation model for both market leaders and developing country firms. To this end, the proposed framework of 'Frugal+Shanzhai', although pending for empirical verification, not only

differs from that of described in the existing literature, but also serves to complement the theoretical development of innovation management.

Rationalizing the Reversed Path-dependent Mechanism: Forcing and Reinforcing the Goal of Catching-up

The reversed path-dependent mechanism of 'Frugal+Shanzhai' model is essentially an imitation-based benchmark system, forcing and reinforcing firms to catch up with or even outperform the preselected targets. This is why frugal-innovation is described as a fast-track for SMEs to gain competitive capabilities and advantages (Luo & Tung, 2007; Luo, et al., 2011; Zhao, 2016; 2017). It was reported that, by December 2010, approximately 70,000 Nano-Cars were rolling on the streets of more than 10 countries (TML, 2010b). Such a success of Nano-Car enabled TML to transform into not only a global leader of cheap-car market, but also a role-model leading the developmental trend of auto-industry and market trend of energy-saving passenger-cars (Bloomberg, 2009; Bruche & Ritterspach, 2010; Muralidhar, 2008; New York Times, 2009; O'Connor, 2008).

STRENGTHS, WEAKNESSES AND SUGGESTIONS

The main contribution of this text lies in its introduction of 'Frugal and Shanzhai' framework contributing to the transformation of developing country firms from imitators to innovators. Given the lack of internal capability required to independently pursue innovation, 'Frugal and Shanzhai' Model may be considered both theoretically as a new paradigm and practically as the best practice (See Table 3, 4, 5, 6; Figure 1), forcing and reinforcing developing country firms to shake off their intrinsically inherited dilemmatic ambidexterity of giving up imitations without compromising their profit-making through the process of costs/prices reductions (O'Reilly & Tushman, 2007).

Having argued the merits of 'Frugal and Shanzhai' framework, two questions are still remained to be further explored. The first unanswered question is that, even though, outsourcing is listed as one of the three tactics to facilitate Nano Project to achieve strategic advantage of costs-risks-reductions (Table 6). It is doubted that, most of developing country firms may not be able to follow the Nano-way of outsourcing, since they do not possess as sufficient internal capabilities (financial, technological and managerial) as TML does. Therefore, they may not be able to allure or convince those industrial leaders to collaborate (Kripalani, 2008a), not to mention the inherent risks imbedded in the process of pursuing radical changes of concepts and designs, mandatorily confined to the preset price-cap. The second unanswered question to be further discussed is the applicability of 'Frugal and Shanzhai' model to those

market leaders. Note that, the word ‘Shanzhai’ is referred as a synonym for imitation, and the word ‘frugal’ as a synonym for cost-reduction, both are commonly discussed topics in the existing literature of management. Nevertheless, convincing market leaders to adopt the imitation-based ‘Frugal+Shanzhai’ model seems to be theoretically irrational, and practically unrealistic and wasteful to their innovation resources and capabilities already established and accumulated through their hard-working and heavy investment. To this end and given the ecologically structured predatory relationship between innovators and imitators, it seems to be meaningful for market leaders to shift their mindset: from provocatively anti-imitation, to proactively improve their capabilities of protecting their Innovations; from meaninglessly accusing developing country firms for their infringement of IPR, and complaining about the developing countries’ government policies, legal, ethical and social systems for their permissively conniving or instigating the rampant imitation activities (like in China), to meaningfully concentrate on creating and consolidating an effective consortium platform, locking developing country firms into innovation collaborations, making ‘imitation’ none value-adding. This is a long-mooted question, still pending for further exploration (Kim, 1980; Kim & Mauborgne, 2000; Park & Lee, 2006; Zhao, 2016; 2017).

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