

HEC MONTRÉAL
École affiliée à l'Université de Montréal

Essays on Reverse Innovation

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Essays on Reverse Innovation

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Résumé

L'innovation inverse souligne que les entreprises étrangères visant le potentiel d'affaires des pays émergents ont besoin d'innover spécifiquement pour répondre aux besoins et conditions du marché fondamentalement différents de celles des pays développés. Malgré une importance pratique et théorique d'innovation inverse, la littérature pertinente est relativement restreinte et caractérisée par l'absence partielle de rigueur théorique et méthodologique, les conceptualisations divergentes, les impacts non documentés sur les pays d'accueil les moins développés, et la compréhension prédominante de l'innovation inverse comme d'un processus fermé.

Par conséquent, l'objectif général de cette thèse a été de contribuer à remédier aux faiblesses et combler les lacunes dans la littérature existante sur l'innovation inverse. La thèse est composée de trois essais, dont chacun se rapporte à un niveau d'analyse différent. L'Essai A explore les impacts sociaux de l'innovation inverse sur le groupe socio-économique le plus pauvre en Inde. L'Essai B repositionne conceptuellement l'innovation inverse comme un phénomène à l'échelle d'une entreprise donnée, tandis que l'Essai C s'appuie sur les facteurs cognitifs pour expliquer les décisions des entreprises en ce qui concerne le processus d'innovation inverse.

Plus précisément, l'Essai A explore les affirmations que l'innovation inverse peut aider à résoudre les problèmes sociaux des pays émergents. Malgré certains avantages identifiés, l'essai ne trouve aucune preuve que l'innovation inverse amène à la prospérité et à la réduction de la pauvreté à grande échelle. Par conséquent, l'innovation inverse est en aucun cas un synonyme de la responsabilité sociale des entreprises. Si elles veulent vraiment résoudre les problèmes sociaux des pays émergents, les entreprises étrangères multinationales devraient se concentrer sur l'achat, plutôt que sur la vente aux pauvres, car cela peut contribuer à renforcer les capacités domestiques, ce qui conduira plus probablement vers la prospérité et la réduction de la pauvreté.

L'Essai B affirme que l'innovation inverse n'est pas exclusivement réservée aux grandes entreprises multinationales occidentales, ni aux pays d'accueil spécifiques ou des niveaux de développement particuliers. L'essai suggère plutôt que l'innovation inverse soit un phénomène au niveau d'un nouveau produit ou service qui est développé en contradiction avec la logique d'innovation dominante de l'entreprise donnée, c'est-à-dire pour un marché autrefois secondaire à l'étranger. L'innovation inverse devient alors un modèle adaptable à chaque entreprise, en ce qui concerne sa situation particulière et la réponse managériale. Enfin, l'Essai C explique pourquoi les entreprises ont (ou n'ont pas) recours à des leviers externes d'innovation inverse tels que l'innovation ouverte, la coopération inter-organisationnelle ou le capital de risque de l'entreprise. En analysant de trois cas de l'innovation inverse par les petites entreprises aux ressources limitées d'une économie à revenu intermédiaire, l'essai conclut que ces entreprises ont contre-intuitivement eu recours uniquement aux leviers externes compatibles avec le noyau d'autoévaluation des propriétaires-gérants. Par conséquent, pour les recherches futures sur le lien entre les caractéristiques individuelles des dirigeants et des choix stratégiques, en ce qui concerne le processus d'innovation, l'essai propose un cadre théorique fondé à la fois sur la théorie des échelons supérieurs, la théorie de noyau d'autoévaluation, et les théories de l'entretien de concept de soi.

Pris dans son ensemble, la thèse contribue à la tendance récente dans la littérature sur l'innovation inverse qui se caractérise par deux aspects : la grande pertinence pratique et la rigueur théorique et méthodologique.

Mots clés : Pays émergents; innovation inverse; bas de la pyramide; impacts sociaux de l'innovation; logique d'innovation dominante; capital de risque de l'entreprise; innovation ouverte; noyau d'autoévaluation; entretien de concept de soi.

Méthodes de recherche : Étude de cas multiples; recherche qualitative.

Abstract

Reverse innovation emphasises that foreign enterprises aiming at business potentials of emerging markets need to specifically innovate in order to address market needs and conditions fundamentally different from those in developed countries. Despite practical and theoretical importance of reverse innovation, present body of pertinent literature is comparatively small and characterised by partial lack of theoretical and methodological rigour, diverging conceptualisations, unresearched impacts on less developed host countries, and predominant understanding of reverse innovation as a closed processes.

Consequently, overall objective of this thesis has been to contribute to remedying weaknesses and filling gaps in extant literature on reverse innovation. The thesis is composed of three essays, each of which addresses a different level of analysis. Essay A explores the social impacts of reverse innovation on the poorest socio-economic group in India. Essay B conceptually re-positions reverse innovation as a phenomenon at the level of any given firm, while Essay C draws on cognitive factors to explain enterprises' decisions regarding the process of reverse innovation.

More specifically, Essay A explores the claims that reverse innovation may help solving social problems of emerging markets. Despite some identified benefits, the essay finds no evidence that reverse innovation results in large-scale prosperity and poverty reduction. Consequently, reverse innovation is by no means synonymous with corporate social responsibility. If they really want to solve social problems of emerging markets, foreign MNEs should focus on buying from – rather than selling to – the poor, since this may contribute to building domestic capabilities as a more likely vehicle towards prosperity and poverty reduction.

Essay B argues that reverse innovation is neither exclusively reserved for large Western multinational enterprises, nor for specific host countries or particular levels of development. Rather, the

essay proposes that reverse innovation is a phenomenon at the level of a new product or service that is developed in contradiction to the dominant innovation logic at the level of any given firm, i.e. for a formerly secondary market abroad. Reverse innovation thus becomes a template that any enterprise may customise with regard to its specific situation and managerial response.

Finally, Essay C explains why enterprises do (or do not) resort to external leverages of reverse innovation such as open innovation, inter-organisational cooperation or corporate venture capital. Analyzing three cases of reverse innovation by small, resource-constrained enterprises from a middle-income economy, the essay concludes that these enterprises counter-intuitively resorted only to external leverages compatible with managing owners' core self-evaluation. Consequently, for future research on the link between executives' individual characteristics and strategic choices regarding the process of innovation, the essay suggests a theoretical framework consisting of upper echelon theory, core self-evaluation theory, and theories of self-concept maintenance.

Taken as a whole, the thesis contributes to the recent trend in the literature on reverse innovation that is characterised by both high practical relevance, and theoretical and methodological rigour.

Keywords: Emerging markets; reverse innovation; bottom of the pyramid; social impacts of innovation; dominant innovation logic; corporate venture capital; open innovation; core self-evaluation; self-concept maintenance.

Research Methods: Multiple case study; qualitative research.

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List of Acronyms

BoP	Bottom of the Pyramid
CVC	Corporate Venture Capital
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IPLC	International Product Life Cycle
JCR	Journal Citations Reports
MIT	Massachusetts Institute of Technology
MNE	Multinational Enterprise
NGO	Non-Governmental Organization
OECD	Organisation for Economic Co-operation and Development
PPP	Purchase Power Parity
R&D	Research and Development
SME	Small and Medium-Sized Enterprises
SPSS	Statistical Package for the Social Sciences

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Foreword

This doctoral thesis is generally written in the plural form ("we"), even though more often than not referring to the author alone. Essay A has been coauthored and consequently written in this form anyway. Additionally, in many sentences, "we" refers commonly to the reader and the author. For the sake of uniformity, I have decided to avoid a mix of singular and plural in the document. However, I am aware that opinions expressed and statements made throughout this thesis may or may not represent the point of view of the reader or the coauthor of Essay A.

All remaining errors are solely mine.

GENERAL INTRODUCTION

Summary

Developing countries have been rapidly increasing their share in the world's economy and are expected to account for the bulk of future economic growth (Jain, 2006; Kose and Prasad, 2010, OECD, 2010)¹. In this global context, a whole stream of related concepts such as cost (Williamson, 2010), frugal (Zeschky et al., 2011), Gandhian (Prahalad and Mashelkar, 2010), jugaad (Radjou et al., 2012) and reverse innovation (Immelt et al., 2009) plausibly stresses that aiming at business potentials of emerging economies entails specifically innovating in order to address market needs – or at least market conditions such as income levels and infrastructure – fundamentally different from those in developed countries. Within this ensemble, reverse innovation has been initially conceptualised as "developing products in countries like China and India and then distributing them globally" (Immelt et al., 2009: 58), which stresses its distinctive feature as potentially dually disruptive innovation: new-market disruptive in mass segments of emerging markets and low-end disruptive in niches of developed markets (Christensen and Raynor, 2003). Despite practical and theoretical importance, however, emerging markets as the new context of innovation are generally underresearched (Vives et al., 2010). Analogously, reverse innovation has received noteworthy appreciation by practitioners, yet despite increasing attention by scholars, our systematic literature review identifies no more than 25 related publications as of July

¹ Terms "developed" and "developing" (countries, economies, markets) use reference points such as income per capita to categorise geo-economic entities according to the level of (particularly economic) development. Despite intuitiveness, categorisations by different sources vary; Essay B elaborates on this in detail. For the sake of simplicity, in this general introduction, terms "country", "economy" and "market" are used synonymously. High-income, OECD-member countries are considered as developed, and all others as developing. Emerging markets are a sub-group of developing countries which transition into free market economies, integrate within the global marketplace, and enjoy rates of economic growth higher than the average in developed countries. Most common examples for emerging markets are Brazil, Russia, India and China.

2015. This comparatively small body of literature is characterised by a number of gaps and weaknesses, particularly with regard to the following:

Diverging conceptualisations: Extant research findings are scattered around different – although not necessarily mutually exclusive – aspects of reversal: flow of innovation outcome from less to more developed countries (e.g. Hang et al., 2010), reversal within the innovation process (e.g. von Zedtwitz et al., 2015: 12), switch of the roles between headquarters and subsidiaries with regard to the flow of knowledge and capabilities (e.g. Borini et al., 2012), and reverse knowledge spillovers from local firms to foreign MNEs in emerging markets (Li et al., 2013). This diminishes reliability of extant findings, and makes reverse innovation limitedly actionable for practitioners and insufficiently robust to absorb further research.

Merely structural interpretation of international business: Reverse innovation is a phenomenon "at the intersection between innovation and international business" (von Zedtwitz et al., 2015: 12). Yet in international business, "the term business can be defined as a firm [i.e. as a structure] or as an activity. If the former, it is synonymous with multinational enterprise; if the latter, it is not" (Wilkins, 2009: 5). As extant literature almost exclusively sees (large) MNEs as actors, reverse innovation has been in fact reserved for (large) firms that own assets abroad, which in turn excludes enterprises that do not, and/or small and medium-sized enterprises (SMEs). Yet additionally to the structural dimension, international business includes the managerial one, which refers to border-spanning managerial activities of *any* enterprise. Particularly agile, innovative SMEs may pursue a global approach (Madsen and Servais, 1997) or reverse innovation (Judge et al., 2015) as a crucial part of their start-up business model.

Impacts on developing host countries: Taken together, the definition of MNEs (Dunning and Lundan, 2008) and the fact that reverse innovation primarily enacts MNEs imply the presence of FDI as a base to develop and/or diffuse reverse innovation. Impacts of FDI on developing host

countries are complex in general (Meyer, 2004) and beneficial or detrimental to local firms in particular (Meyer and Sinani, 2009); reverse innovation may have augmenting or offsetting effects here. Though Govindarajan and Ramamurti (2011) put the link between reverse innovation and FDI on their extensive research agenda, and Govindarajan and Trimble (2012) purport large and positive social effects on emerging markets, these themes have remained unresearched so far.

Closeness of innovation processes: Reverse innovation has been predominantly understood as a process within a *single* firm or its intra-firm network. Yet innovation literature generally proposes resorting to external sources of innovation such as technologies and knowledge (Chesbrough, 2003; West and Bogers, 2014), equity stakes in innovative start-ups (Chesbrough, 2002), or collaboration with competitors (Hamel et al., 1989). Particularly when innovating for emerging markets, enterprises are additionally well advised to co-invent custom solutions and cooperate with local businesses, NGOs and governmental stakeholders (London and Hart, 2004).

Lack of theoretical and methodological rigour: The very inception of reverse innovation was characterised by ill-conducted research, detached from pertinent management literature, and based on very few anecdotes rather than empirically grounded, theoretically framed results (Cunha et al., 2014). A good deal of early research has hence the characteristics of what Huff (2000) neutrally calls "Mode 2" production of knowledge, and Anderson et al. (2001) rather pejoratively "Popularist Science": research recognized as highly relevant for the practice, yet of low theoretical and methodological rigour. As this kind of research is driven by demand from the managerial market for knowledge (Huff, 2000), we concur with Hodgkinson et al. (2001) that its wholesale abandonment is less important than restoring the balance in favour of "Pragmatic Science", or "Mode 1.5" approach to knowledge production (Huff, 2000), which is characterised by both, high practical relevance and high theoretical and methodological rigour.

Consequently, *overall objective of this thesis has been to contribute to remedying weaknesses of and filling gaps in extant literature on reverse innovation*. Within this overall objective, each essay addresses different gap/weakness (cf. Table 1). Essay A aims at filling the gap about the impacts of reverse innovation on developing host countries; Essay B attempts to overcome diverging conceptualisations and merely structural interpretation of international business; Essay C addresses the predominant notion of reverse innovation as a closed process. As a whole, the thesis aims to contribute to restoring the balance in favour of pragmatic science.

Considering the state of extant literature, potential research questions abound. The selection of those that have eventually been addressed had resulted from the author's assessment of thematic priority, a blend of critical realism and pragmatism as underlying research philosophy, and a generally – though not exclusively – inductive approach taken:

- Essay A: Which (positive) social impacts, if any, has reverse innovation had on the largest but poorest socio-economic group in India ("the Bottom of the Pyramid")?
- Essay B: What is the concept of reverse innovation *really* about?
- Essay C: Why and to which external leverages of reverse innovation do enterprises (not) resort?

Note that essays are ordered merely according to the maturity regarding the publication process; Table 1 on page 8 summarises their essential properties.

Essay A goes back to the author's axiological beliefs and commitment to innovation that benefits both, business and society. The essay therefore explores the claim that reverse innovation may benefit Western MNEs by simultaneously solving most vexing social problems of emerging markets. A four-staged process-model of reverse innovation and an assessment framework for social impacts are applied to secondary data in order to identify and assess impacts of reverse innovation that go beyond other FDI-related impacts. As a result, the essay finds some positive social

impacts, notably diminishing of horizontal inequality among social groups, access to healthcare, and creation of opportunities to participate in consumption. However, the analysis finds no evidence to support the claims that reverse innovation results in large-scale prosperity and poverty reduction. In line with Cozzens and Kaplinsky (2009), we thus conclude that poverty and inequality may trigger reverse innovation, but that reverse innovation hardly reduces poverty from which it has resulted. As a research avenue of particular interest, we propose studying reverse innovation endeavours that employ the Bottom of the Pyramid as a source of efficiency, and hence contribute to building domestic capabilities as a more likely vehicle towards prosperity and poverty reduction (Lundvall et al., 2009). In short, the main contribution of Essay A is that it isolates and rigorously assesses marginal impacts of reverse innovation on the poorest socio-economic group in India. On a more general note, it indicates that pursuing reverse innovation should by no means be viewed as synonymous with (a new form of) corporate social responsibility in emerging markets.

Essay B is a conceptual paper with explanatory purpose. On the one hand, it results from the author's perception of diverging conceptualisations as the most detrimental and most urgent weakness of extant literature on reverse innovation. On the other, it is an evident expression of pragmatism, as an unusual design is employed to answer an unusual research question. The essay first identifies five roles subordinate to reverse innovation (e.g. the acting enterprise or short "the actor"), re-interprets each role individually, and finally synthesises all roles within a plot template of reverse innovation. Rather than relatively to the geo-economic environment, reverse innovation is repositioned relatively to the traditional innovation management of the actor, as a new product or service that is developed in contradiction to the dominant innovation logic at the firm level. As the dominant innovation logic is peculiar to the enterprise in question, reverse innovation becomes a template that any enterprise irrespectively of its size, equity structure or origin

may and *has to* customise along two dimensions of distance – exogenous and endogenous – to a new primary market abroad. The environment to reverse innovation endeavours may include countries of any level of development from a continuous distribution, various paths of technology diffusion, or actors drawing on either or both internal and external technologies. Commonly mentioned aspects of reversal – particularly the diffusion of innovation outcome from less to more developed countries – may or may not be contained, but they are neither sufficient nor necessary criteria to conceptualise reverse innovation. As promising theoretical perspectives, particularly resource based view (Leonard-Barton, 1992), dynamic capabilities (Teece, 2007) and open innovation (Chesbrough, 2003) are suggested. Therefore, the major contribution of this essay is that it proposes a flexible but robust and valid concept of reverse innovation. Stressing the managerial interpretation of international business, Essay B achieves both, to smoothly integrate a good deal of previous literature on reverse innovation and to open the concept to any firm.

Essay C commences from the predominant notion of reverse innovation as a closed process to ultimately explain (not) resorting to external leverages with executives' individual characteristics. External leverages are understood as a meta-construct that includes three dimensions: content, form and purpose. A multiple explanatory case study is performed with three SMEs from Serbia, since such firms do not necessarily possess technological assets and usually lack capital (OECD, 2013). In this constellation, external leverages are likely needed and relied on, so this setting facilitates answering the research question. As embedded technique to analyse primary and secondary data collected, we employ explanation building. That means that we in fact commence deductively, from a rather atheoretical initial explanation inferred from previous literature – namely that enterprises would (not) resort to external leverages depending solely on own resource endowment. As data uncovered with this initial explanation emerge, we continue inductively and iterate until the final explanation is found, according to which an enterprise's factual or *perceived*

resource base determines which external leverages of reverse innovation may *potentially* be resorted to. However, decisions whether these leverages will be *in fact* resorted to, and if so to which extent, are made in a way that maintains the decision makers' core self-evaluation, which may or may not be the optimal decision regarding innovation performance. In consequence, we propose a theoretical framework consisting of upper echelon theory (Hambrick and Mason, 1984), core self-evaluation theory (Judge et al., 1997), and theories of self-concept maintenance (Carver and Scheier, 1981; Higgins, 1987; Mazar et al., 2008). Therefore, Essay C makes three important contributions. First, it links two streams of research that were largely segregated until now: external sources of innovation and emerging markets as the new context of innovation (Vives et al., 2010). Second, it provides a piece of evidence on how executives' individual characteristics affect the strategic choices about the innovation process. While a later refinement of the upper echelons (Hiller and Hambrick, 2005) adds the theory of core self-evaluation to the theoretical lens, as its third contribution, Essay C completes this framework with theories of self-concept maintenance.

In sum, the thesis as a whole delivers empirically grounded and theoretically framed results, which in turn contributes to the recent trend in the literature on reverse innovation that is characterised by both, high practical relevance and theoretical and methodological rigour.

The rest of this general introduction consists of two interlinked parts. The upcoming systematic literature review (Sections 1 to 5) follows the objective to conceptually consolidate, critically evaluate and selectively synthesise extant findings on reverse innovation. Subsequently, Section 6 links thesis essays with the gaps and weaknesses that emerge from the literature review, presents the author's research philosophy, explains approach taken and research designs employed, and eventually transitions to the essays.

Property	Essay A	Essay B	Essay C
Gap and/or weakness addressed	Impacts of reverse innovation on developing host countries	Diverging conceptualisations; Merely structural interpretation of international business	Closeness of innovation processes
Research question	Which (positive) social impacts, if any, has reverse innovation had on the largest but poorest socio-economic group in India ("the Bottom of the Pyramid")?	What is the concept of reverse innovation <i>really</i> about?	Why and to which external leverages of reverse innovation do enterprises (not) resort?
Level of analysis	Country (the Bottom of the Pyramid in India)	Enterprise pursuing reverse innovation	Process of reverse innovation
Article type	Empirical illustration	Conceptual	Empirical
Title	Reverse Innovation and the Bottom of the Pyramid Proposition: New Clothes for Old Garbs?	Reverse Innovation Reconceptualised: Much Geo-Economic Ado about Primary Market Shift	External Leverages of Reverse Innovation versus Managerial Core Self-Evaluation
Approach	Inductive	Inductive	Inductive; combines deductively based data-analysis technique
Purpose	Exploratory	Explanatory	Explanatory
Method	Multiple illustrative case study	Logical (inductive) reasoning	Multiple explanatory case study
Data sources	Secondary	Secondary	Primary and secondary
Frameworks developed or adapted	Four-staged process model of reverse innovation; <i>Assessment framework for social impacts</i>	Plot template of reverse innovation; Total distance framework	Three-dimensional concept of external leverage
Main theoretical themes suggested	Innovation systems, particularly capability building and the link between innovation, poverty and inequality	Resource based view; Dynamic capabilities	Upper echelon theory; Core self-evaluation; Theories of self-concept maintenance

Table 1: Major properties of essays

1. Literature Review: Objective, Method and Structure

Being aware of different conceptualisations of reverse innovation, we refrain from an attempt to *generally* synthesise extant literature. Different underlying concepts necessarily challenge construct validity (Yin, 2014: 238), which is in turn a critical precondition for a literature synthesis (Rousseau et al., 2008). On the other hand, however, different conceptualisations still overlap (Essay B), and may indicate different aspects of the same reversal. In consequence, we steer the middle course, and set the objective *to conceptually consolidate, critically evaluate and selectively synthesise the findings of extant literature on reverse innovation*. Put differently, the literature review generally aims at consolidation and evaluation of prior conceptual findings, and at their synthesis where suitable and feasible.

Narrative (or "heuristic") reviews of literature still represent the predominant approach in management science, yet they frequently lack rigor and may be biased, as the selection of literature to include remains largely at researchers' discretion (Hodgkinson and Ford, 2014; Tranfield et al., 2003). In contrast, systematic reviews "improve the quality of the review process and outcome by employing a transparent and reproducible procedure" (Crossan and Apaydin, 2010: 1156). Therefore, the decision has been made to draw on the method of systematic reviews.

Systematic reviews always consist of stages or phases, yet their definition and content vary depending on the source (cf. for instance among Cooper, 1989; Greenhalgh, 1997; Tranfield et al., 2003; Boaz et al., 2006; Rousseau et al., 2008), objectives (e.g. conceptual versus empirical synthesis) and eventually purpose – academic consolidation of research (Hodgkinson and Ford, 2014) or managerial evidence-based decision making (Briner et al., 2009). In line with the objective of our review, we particularly adopt propositions by Tranfield et al. (2003) and Rousseau et al. (2008), and define the following stages.

Planning: Drawing on the objective of the review, this stage decides which literature to semantically aim at, plans which databases to search for the literature, translates search semantics into search keywords, and sets the criteria for inclusion/exclusion of literature in/from the review.

Execution: The search in selected databases is executed in this stage, and all items of literature that match the search criteria are collected in a raw literature sample.

Quality Assurance: The raw sample is refined by removing duplicates and applying criteria for inclusion and exclusion defined in the planning stage. As the result, a core sample for the literature review is created.

Descriptive Analysis: In this stage, descriptive analyses of the core sample are performed; properties of collected items such as publication year, publishing outlet and geographical region of authors' affiliation are employed for various breakdown-based descriptive analyses.

Literature Consolidation, Evaluation and Selective Synthesis represent the major part of the review. Rather than to a single method, however, systematic reviews refer to a *family of methods* that aim at drawing comparisons and holistic conclusions from the literature being reviewed (Boaz et al., 2006). Statistical meta-analysis as one of these methods is particularly applicable to medical research, where reviewed literature is frequently homogenous with regard to both, research questions addressed and quantitative character of data used (Tranfield et al., 2003). In management science, however, systematic but flexibly structured reviews "congruent with [the field's] pluralism in methods, phenomena and potential end users" are needed (Rousseau et al., 2008: 500). In the present literature review, flexibility is particularly warranted due to the expected differences among conceptualisations of reverse innovation, which need to be analysed at the outset of the stage. In turn, different conceptualisations mean per se that there is no uniform concept that could be applied to organise the consolidation. As a consequence, we combine interpretative and integrative approaches (Rousseau et al., 2008), and first derive a uniform meta-

model of reverse innovation from the core sample (interpretation) to subsequently organise the results of previous research along the elements of this meta-model (integration). Finally, we identify major theories (explicitly or implicitly) employed by the literature reviewed. Given the objective to concentrate on conceptual results of previous work, we adopt the suggestion by Hodgkinson and Ford (2014), and compile the core sample into several tables displaying features of individual items so as to make conclusions, identify issues, and discuss implications. Section 5 concludes the literature review by highlighting its overall results.

2. Planning, Execution and Quality Assurance

As stated previously, our literature review focuses on conceptual results of prior research on reverse innovation. Nevertheless, we include both conceptual and empirical publications, yet with the intent to extract *conceptual* contributions (rather than empirical data) from the latter.

Both ABI/Inform and Web of Science were chosen as academic databases of record, since they are among most comprehensive databases of business literature. Note that ABI/Inform is a *full-text* database, so it consequently allows for a keyword-based search within titles, abstracts, keywords, and full texts of publications. In contrast, Web of Science is a *bibliographic* database, so it provides no possibility to search in full texts. Due to the novelty of reverse innovation, we anticipate a small number of publications on this topic, follow suggestions by Conn et al. (2003) and Tranfield et al. (2003), and additionally include so called *gray literature* from Google Scholar.

As search keywords, "reverse innovation" and its derivate "reverse innovations" were initially chosen. Being aware that "[management] researchers can employ a non-standardized array of terminology to refer to the same underlying constructs" (Rousseau et al., 2008: 503), we additionally included "innovation blowback" (Brown and Hagel, 2005) in singular and plural form as the only synonyms of reverse innovation known to us. A recognised limitation of our keywords

based search is that it may fail to identify previous literature that elaborates on phenomena virtually identical to reverse innovation by using a different label, or even by descriptively referring to the same phenomenon without using any particular label. For example, a report by Deloitte (2006) and a book by Jullien et al. (2012) do not use any specific term for new products developed for emerging markets that eventually diffused to advanced ones, such as Renault's inexpensive Logan car (ibid), which was developed for and marketed first in Eastern Europe. However, this issue is mitigated by the "Keywords Plus" feature of the Web of Science database, which tags a publication with thematic keywords in addition to the content-based ones chosen by the respective author(s). For instance, the article by Sartor and Beamish (2014) does not use the term "reverse innovation" anywhere in the text, but it was identified during the execution stage and included in the core sample due to the "reverse innovation" tag in "Keywords Plus".

In each database, we searched only for articles and not e.g. books, book chapters or conference papers. As Google Scholar does not feature any filter for document types, we planned to exclude non-articles obtained from this database manually, in the quality assurance stage.

Although the concept (but not the term) of reverse innovation was first proposed by Brown and Hagel (2005), and the phenomenon and the term first linked by Immelt et al. (2009), we searched within the timespan from 2000 to 2015. Setting this lower bound was expected not only to include all literature on reverse innovation in the sense of our interest, but – in connection to the aforementioned "Keywords Plus" – also its potential and ex ante unknown forerunners.

Finally, some additional search criteria were planned depending on the features peculiar to the respective source database, e.g. we search only in the Web of Science core collection (Table 2).

	ABI/Inform	Web of Science	Google Scholar
Publ. type	Article	Article	Article*
Further criteria	Peer reviewed, scholarly journals only	Web of Science core collection; Research area: "business economics"	
Search in	Everywhere except full text	Topic	Title
Search keywords	"reverse innovation"; "reverse innovations"; "innovation blowback"; "innovation blowbacks"		
Timespan	2000-2015		

Table 2: Overview of search criteria

**Publication type manually filtered during the quality assurance stage*

The foremost subject to planned exclusion were false positives, i.e. items of literature that use a search keyword in some homonymous way. For instance, we have been aware that "reverse innovation" in sense of Foxall (1989: 95) refers to "new product marketing by users" i.e. to the concept of lead users (von Hippel, 1986), and in sense of Changqing et al. (2005) to the concept of reverse engineering (UNESCO, 2005: 218). Further, we planned to substitute book reviews published in peer reviewed outlets by the respective book being reviewed, and to exclude the following items without any substitution:

- Papers written in languages other than English or French²
- Books and book chapters, conference papers, doctoral and master's thesis, reports, working papers, interviews, debate/opinion papers, editorials and papers labeled not citable
- Papers unrelated to management and/or business
- Papers from outlets known for charging publication fees directly (per published item) or indirectly (via compulsory memberships subject to fees)

² In fact, French versions of the keywords (e.g. "l'innovation inverse") were not searched for, so the execution stage was supposed to deliver items in English only. Nevertheless, several publications in Chinese, Italian and Polish were retrieved from Google Scholar but excluded from the review during the quality assurance stage.

Note that some of these exclusion criteria were defined due to intent to include gray literature coming from Google Scholar, which – in contrast to ABI/Inform or Web of science – does not offer corresponding filters such as publication type.

The *execution stage* resulted in a raw sample of 112 items, of which respectively 13, 19 and 80 from Web of Science, ABI/Inform and Google Scholar.

In the *quality assurance stage*, the full texts of all items were collected in the raw sample. Subsequently, abstracts and – where necessary – full texts were screened for compliance with inclusion criteria. We first assured the quality of the raw subsample obtained from Web of Science and ABI/Inform, and removed 7 duplicates, 2 false positives, and 5 non-research papers. Additionally, we substituted two reviews of the book by Govindarajan and Trimble (2012) published in peer reviewed outlets by the book itself. After removing duplicates and excludable items, the raw subsample from Google Scholar contributed another 8 items (all of which articles) to the core sample. Ultimately, a core sample of 25 items was created (24 articles and one book), and last updated on July 16, 2015.

3. Descriptive Analysis

Overall, an upward publication frequency on reverse innovations seems indicated since 2011, with a temporal drop in 2013 (Figure 1 and Figure 2). The oldest item in the sample, the aforementioned paper by Brown and Hagel, was published in 2005. While this paper does not mention the term "reverse innovation", the authors use the term "innovation blowback" to refer to a virtually identical phenomenon. Four years later, innovations diffusing from developing to developed countries and the term "reverse innovation" were linked by Immelt et al. (2009), which is the second oldest item in the sample. Only three recent papers in the sample (Corsi and Di Minin, 2014; von Zedtwitz et al. 2015; Zeschky et al., 2014a) mention Brown and Hagel. In contrast,

virtually all publications since 2010 mention Immelt et al. (2009), or subsequent work of the same authors. Consequently, it is possible that Brown and Hagel (2005) were initially disregarded (too) early observers of the phenomenon. However, it is also possible that the literature had discovered, then neglected, and finally re-discovered reverse innovation, while tagging relevant publications in a way that made us not recognising and hence not considering them.

In line with the objective to focus on conceptual results, a distinction between empirical and non-empirical publications was made solely depending on how they link propositions and data, be the latter qualitative or quantitative, primary or secondary. In this sense, empirical publications *employ* (usually primary) data to develop/prove theoretical or conceptual propositions. In contrast, non-empirical publications *illustrate* by resorting to (usually but not necessarily secondary) data, or use them to provide examples, if any data are resorted to. Non-empirical items in the sample are more frequent than empirical ones (17 versus 8). In fact, until 2012, publications on reverse innovation were exclusively non-empirical. The core sample thus indicates a low share but possibly an emerging trend towards more empirical publications (Figure 1).

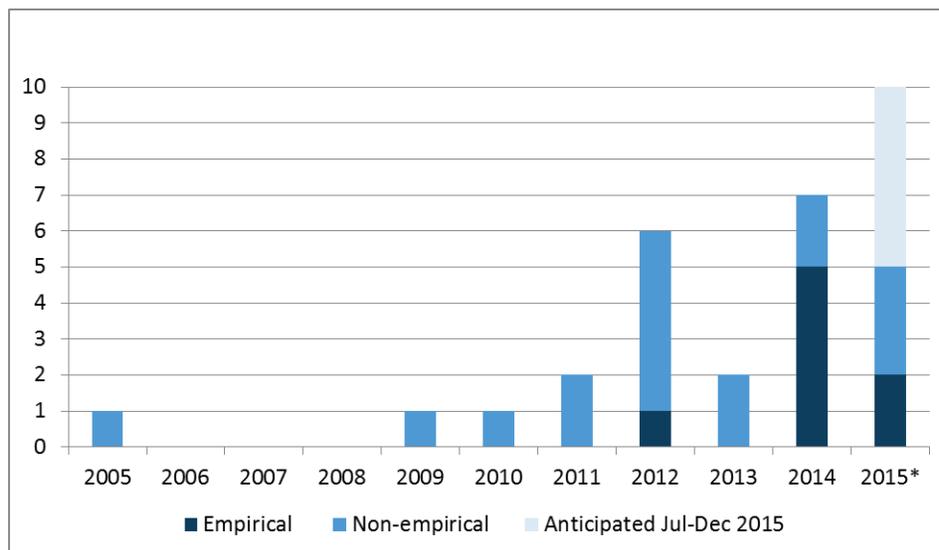


Figure 1: Annual publication frequency, empirical versus non-empirical items
 *Number of publications for July-December estimated

Harvard Business Review and Research Technology Management contributed 3 articles each to the core sample; remaining 18 articles appeared in 18 different outlets. Almost a half of all articles (11 out of 24) were published in outlets listed in the Journal Citation Reports (JCR) Social Sciences Edition 2014 (Figure 2).

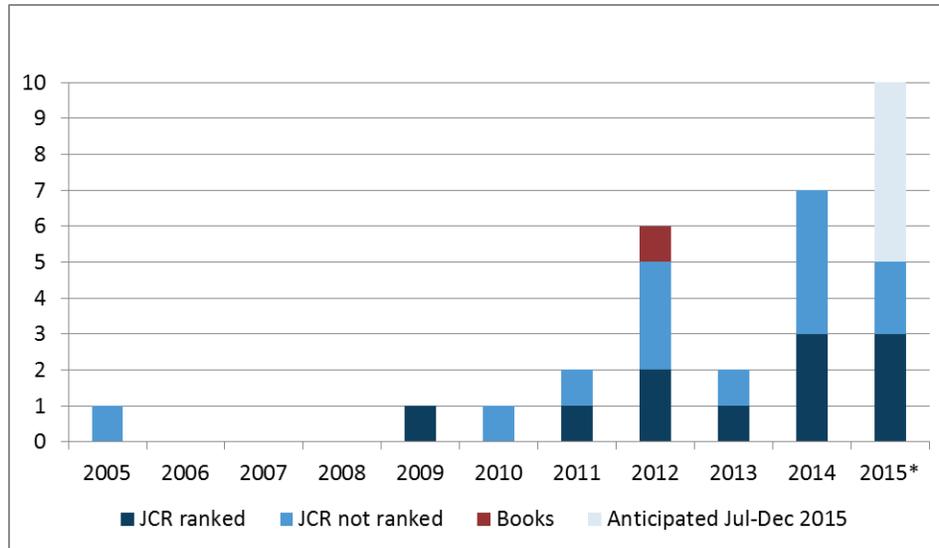


Figure 2: Annual publication frequency, JCR 2014 ranked versus non-ranked outlets
**Number of publications for July-December estimated*

As the ranking of publishing journals is an important criterion for assessing quality of individual articles in management research (Tranfield et al., 2003), a corresponding breakdown of the core sample according to the JCR 2014 rankings was performed. For outlets ranked in more than one category (e.g. "Management" and "Business"), the highest ranking was selected. Interestingly, while a share of articles from JCR listed outlets remains rather stable (ranging from 40% in 2012 to 60% in the first half of 2015; Figure 2), a large majority of articles on reverse innovation ever published in JCR listed outlets proved concomitantly to have appeared in higher ranked journals, i.e. journals ranked 1st or 2nd quartile (Figure 3).

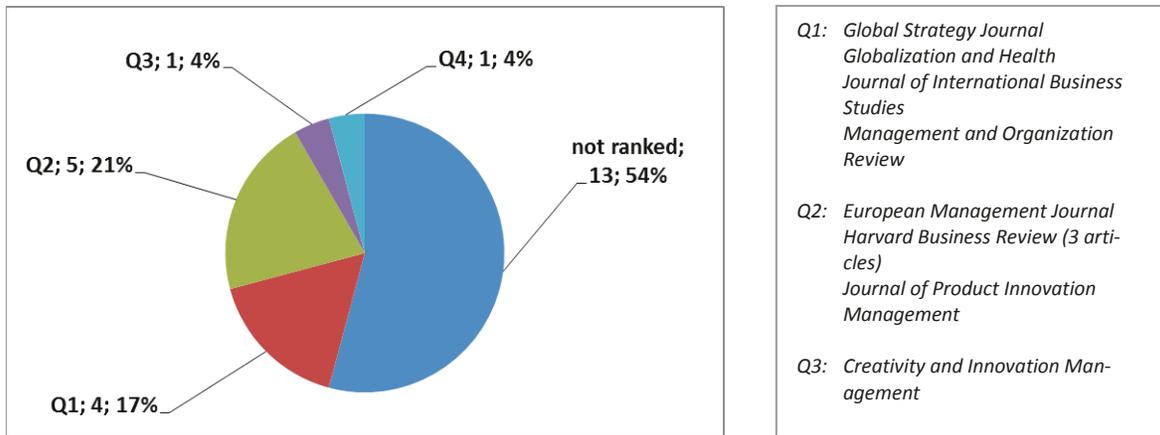


Figure 3: Breakdown of the core sample (articles only) by JCR ranks of publishing outlets
 "Qx; y; z%" indicates ranking quartile (x), absolute number (y) and share (z%)

The items in the core sample have been written by a total of 48 authors, whose affiliations spread over Asia, Europe, North and South America. Authors of European and North American affiliation represent a good third (17 authors) each, with the authors of Asian and South American affiliation being weaker represented (7 each; Figure 4).

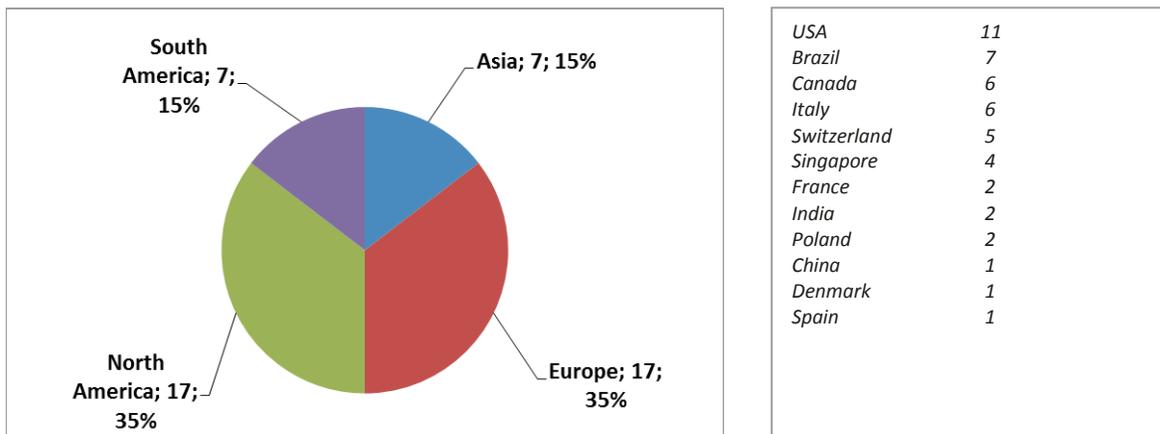


Figure 4: Breakdown of the core sample (all items) by authors' geographical affiliations
 "A; y; z%" indicates geographic region (A), absolute number (y) and share (z%)

This distribution indicates the literature on reverse innovation being dominated by authors from few countries of the transatlantic part of the Triad. However, authors with affiliations in G7 countries Germany, Japan, and UK are missing. More specifically, Vijay Govindarajan, a professor at the New Hampshire based Tuck School of Business and former chief innovation consultant at

General Electric, has authored or co-authored a relative majority of 6 items from the core sample, 5 of which from 2009 to 2012, including the pioneering paper on General Electric (Immelt et al., 2009). The case of General Electrics (or rather empirical anecdote; von Zedtwitz et al., 2015) was later included in the book by Govindarajan and Trimble (2012), which currently provides a largest single collection of examples of reverse innovation (Deere & Company, EMC Corporation, General Electric, Harman International Industries, Logitech, PepsiCo and Procter & Gamble). These seven anecdotes are mentioned throughout the sample (Table 3). New cases are rare, and include “Speres” (an anonymous Italian MNE; Corsi and Di Minin, 2014); Renault (Laperche and Lefebvre, 2012); Suzlon, Galanz, Haier, and Yadea (Hang et al., 2010); GRIT (an US start-up; Judge et al., 2015), and undisclosed cases in Zeschky et al. (2014a, 2014b). However, some of these cases are echoed in later publications as well (Table 3).

Case	Chronological occurrence in the core sample
Deere & Company	Govindarajan and Trimble (2012); Govindarajan and Trimble (2012b); Sinha (2013); Corsi and Di Minin (2014); Winter and Govindarajan (2015)
General Electric	Immelt et al. (2009); Govindarajan and Ramamurti (2011); Govindarajan and Trimble (2012); Govindarajan and Trimble (2012b); Kamp (2012); Laperche and Lefebvre (2012); Li et al. (2013); Sinha (2013); Corsi and Di Minin (2014); Judge et al. (2015); Ostraszewska and Tylec (2015); Sartor and Beamish (2015); von Zedtwitz et al. (2015); Winter and Govindarajan (2015)
Harman International	Govindarajan (2012); Govindarajan and Trimble (2012); Govindarajan and Trimble (2012b); Corsi and Di Minin (2014);
GRIT	Judge et al. (2015); Winter and Govindarjan (2015)
Logitech	Govindarajan and Trimble (2012); Corsi and Di Minin (2014); Zeschky et al. (2014b); Ostraszewska and Tylec (2015)
PepsiCo	Govindarajan and Trimble (2012); Govindarajan and Trimble (2012b); Sinha (2013); Ostraszewska and Tylec (2015); Winter and Govindarajan (2015);
Procter & Gamble	Govindarajan and Trimble (2012); Sinha (2013); Corsi et al. (2014); Corsi and Di Minin (2014); Ostraszewska and Tylec (2015); von Zedtwitz et al. (2015); Winter and Govindarajan (2015)
Renault	Laperche and Lefebvre (2012); Winter and Govindarajan (2015)

Table 3: Repetition of cases in the core sample

This lack of diversity is ultimately pronounced by the uniformity of constellations studied, which was equally observed by Subramaniam et al. (2015). Most depicted enterprises are large US MNEs, with few exceptions from West Europe and Asia. As emerging markets for which the actors innovated, China and India are mostly mentioned, with the exception of Procter & Gamble that innovated for Mexico.

By far the most frequently cited item from the core sample, Immelt et al. (2009), has been cited roughly 400 times so far. Paradoxically, 7 out of 10 top-cited items are simultaneously among 10 items that make least references (Table 4, items in italic).

Top Rank, Item	Citations*	Bottom Rank, Item	References**
1. <i>Immelt et al., 2009</i>	398	1. <i>Immelt et al., 2009</i>	0
2. <i>Govindarajan and Trimble, 2012</i>	209	2. Winter and Govindarajan, 2015	0
3. Govindarajan and Ramamurti, 2011	146	3. <i>Govindarajan, 2012</i>	1
4. <i>Brown and Hagel, 2005</i>	98	4. <i>Govindarajan and Trimble, 2012b</i>	3
5. <i>Hang et al., 2010</i>	48	5. <i>Brown and Hagel, 2005</i>	7
6. <i>Govindarajan, 2012</i>	33	6. <i>Hang et al., 2010</i>	11
7. Borini et al., 2012	17	7. <i>Vinekar, 2011</i>	11
8. <i>Govindarajan and Trimble, 2012b</i>	12	8. Snowdon et al., 2015	11
9. <i>Vinekar, 2011</i>	11	9. Corsi et al., 2014	12
10. Sartor and Beamish, 2014	4	10. <i>Govindarajan and Trimble, 2012</i>	17

Table 4: Most cited items and items with least references

* According to Google Scholar; ** Excluding references in appendixes

That being said, earlier publications in the core sample generally tend to use fewer references. A simple linear regression model tested with SPSS indicates with 85% confidence that a higher number of references is determined by a later year of publication. When the most recent outlier (Winter and Govindarajan, 2015) is excluded, the confidence rises to 92%. Another simple

(ANOVA) model reveals with confidence above 95% the tendency of particular outlets (i.e. Harvard Business Review) and certain authors to use fewer or even no references. The latter applies most regretfully to the "fathers" of reverse innovation, who clearly drew on previous research, yet who nevertheless omitted to integrate the concept with pertinent literature, thus failing to direct our attention to what is really new about it. For illustration, Immelt et al. (2009) do not refer to a single piece of literature. Govindarajan and Trimble (2012) refer mostly to newspapers and magazines in the main text, and in the appendix only to few articles published in JCR listed outlets. Yet almost all of these papers are aged (e.g. Vernon, 1966) or hardly about innovation (e.g. Eisenhardt and Graebner, 2007). Obviously, this is by no means to claim that a *high* number of references used in a publication is a *sufficient* criterion for its integration with a particular body of literature. Rather, we argue that a *certain* number of references is *necessary* to link a publication to prior research. While this number evidently does not equal zero or one, it may nevertheless be a comparatively small one. For instance, the forerunner paper by Brown and Hagel (2005) uses only 7 references, yet these at least position the concept of innovation blowback as the opposite of so called "corporate imperialism" (Prahalad and Lieberthal, 1998).

In sum, the breakdown-based analysis finds that the body of literature on reverse innovation contains a considerable share of papers appeared in high quality outlets, though it is generally of a limited size. Early publications introduced reverse innovation by means of empirical anecdotes, rather than by empirically grounded conceptual work, and largely failed to integrate the concept with prior literature at the very outset. The inception of reverse innovation was driven by very few if not a single author, and is heavily influenced by the anecdotal evidence from the case of General Electrics. Even today, the literature on the topic misses diversity regarding focal enterprises, country constellations and geographical distribution of authors' affiliations. The trends emerging from the descriptive analysis are recent and hence limitedly reliable, yet they may in-

duce a cautious optimism as a shift towards a higher share of empirical and more integrated work seems indicated.

4. Consolidation and Evaluation

4.1. Conceptualisations of Reverse Innovation

Different labels aside, there is virtually no difference between the conceptualisations implied by two earliest publications in the core sample. Innovation blowback by Brown and Hagel (2005) warns from disruptive practices by Asian enterprises and urges Western MNEs to target "the specific and demanding needs of lower-income consumers" in emerging markets, and "create the ability to take innovative products and services from the emerging world and use them in new categories at home" (p. 45). For Immelt et al. (2009), reverse innovation collectively addresses the cases of medical devices by General Electric (GE) that were initially introduced to Chinese/Indian market but eventually diffused to developed economies, particularly to the US, where they are "pioneering new uses for such machines" (p. 56).

Although these two papers derive suggestions that explicitly target Western executives, they ultimately remain confusing with regard to what exactly the concept is and to whom it applies, as enterprises from emerging markets are repetitively mentioned as well. For instance, "if GE doesn't come up with innovations in poor countries and take them global, new competitors from the developing world [...] will" (ibid: 59). Therefore, it is debatable whether for these two papers the actual reversal equals the mere path of innovation diffusion from less to more developed countries (which is how we interpret them), a novel or formerly unnoticed combination of this diffusion path and Western MNEs, or something else. Consequently but not surprisingly, the remaining sample echoes the concept differently (Table 5), especially with regard to the actor (i.e. the focal enterprise) and the actual reversal.

Reversal	Actor	Publication
Innovation flow from developing to developed countries	Any MNE	Brown and Hagel (2005); Corsi and Di Minin (2014); Govindarajan and Ramamurti (2011); Hang et al. (2010); Immelt et al. (2009); Kamp (2012); Sinha (2013); Zeschky et al. (2014b)
	MNEs from the Triad	Corsi et al. (2014); Govindarajan (2012); Govindarajan and Trimble (2012, 2012b); Winter and Govindarajan (2015); Zeschky et al. (2014a);
	Other or unclear	Judge et al. (2015); Ostraszewska and Tylec (2015); Snowdon et al. (2015); Vinekar (2011)
Two consecutive stages of the linear innovation process that take place in developing respectively developed country	Any MNE	von Zedtwitz et al. (2015)
R&D performed upstream in emerging markets to target local and global market	MNEs from the Triad	Borini et al. (2014); Laperche and Lefebvre (2012)
Flows of knowledge and capabilities from foreign subsidiaries to the parent	Emerging market MNEs	Borini et al. (2012)
Innovation flows from subsidiaries <i>or suppliers</i> in emerging markets to the parent	MNEs from the Triad	Baglieri et al. (2014); Sartor and Beamish (2014)
Knowledge spillovers from local firms to subsidiaries of foreign MNEs in emerging markets	MNEs from the Triad	Li et al. (2013)

Table 5: Differences in understandings of the reversal and the actor

These diverging conceptualisations are an unfortunate but logical consequence of two birth-defects of the literature stream on reverse innovation: largely ill-conducted research combined with vaguely defined scope and/or point of reference of the phenomenon. Different labels for the same concept – "innovation blowback" in Brown and Hagel (2009), and "reverse innovation" in Immelt et al. (2009) and thereafter – are hence a negligible issue compared to four others.

Firstly, levels of analysis and points of reference to the inversion diverge. For most sources, the level of analysis is the *outcome* of innovation that diffuses from developing to developed countries, so the point of reference is the International Product Life Cycle (IPLC; Vernon, 1966, 1979). Innovation *process* as the level of analysis is particularly stressed by von Zedtwitz et al.

(2015), for whom the reversal means that two consecutive stages from the linear innovation model (concept, development, primary and secondary market diffusion; Godin, 2006) take place in a developing respectively a developed country. Laperche and Lefebvre (2012) and Borini et al. (2014) also generally address the inversion within the process of innovation, but focus on the locus and mandate of R&D activities within it. For Li et al. (2013), the level of analysis are FDI-related *knowledge spillovers* which divert from their usual direction (Perri and Peruffo, 2015; Zhang et al., 2010), and flow from local firms to subsidiaries of foreign MNEs in emerging markets. For remaining items, the level of analysis is the *firm*, innovation primarily about capabilities, knowledge and technology, and the reversal means their flows from subsidiaries (Borini et al., 2012; Baglieri et al., 2014) or alternatively suppliers in emerging markets (Sartor and Beamish, 2014) to headquarters of foreign MNEs, rather than the other way round (Almeida and Phene, 2004; Phene and Almeida, 2008; Millar and Choi, 2009).

Secondly, the actor enacting reverse innovation is almost exclusively a (large) MNE, which over-stresses the structural interpretation of international business. As Wilkins (2009: 5) notes, in international business, "the term business can be defined as a firm [i.e. as a structure] or as an activity. If the former, it is synonymous with multinational enterprise; if the latter, it is not". In other words, extant literature makes reverse innovation implicitly reserved for enterprises of particular size that own assets abroad, which in turn excludes enterprises that do not, and/or small and medium-sized enterprises (cf. Essay B).

Thirdly, virtually the whole literature stream makes an oversimplifying assumption with regard to distribution of levels and paces of economic development, and categorises geo-economic entities in a dichotomic manner as either advanced/developed or developing/emerging, with particular focus on the US among the former, and India and China among the latter. However, even major international institutions such as International Monetary Fund (IMF, 2014), the World Bank

(WBDI, 2015) and UNO (2013) categorise geo-economic entities slightly but significantly differently, while any assumed dichotomy excludes the most entities located in the middle of the distribution along a continuous property such as income per capita (cf. Essay B, Essay C).

Fourthly and most importantly for a systematic literature review, different conceptualisations question the construct validity at the aggregate level of the literature stream. Therefore, as no uniform concept is given, a surrogate framework that integrates different conceptualisations and organises findings is necessary. For reasons explained in the following section, we call this framework a *meta-model* of reverse innovation, and derive it by adapting and – where warranted – extending the multi-dimensional framework of organisational innovation by Crossan and Apaydin (2010). Drawing on this seminal framework finally creates a bridgehead to synthesised research on organisational innovation in general, which in turn may facilitate future research on reverse innovation.

4.2. Meta-Model of Reverse Innovation

Prior literature largely relies on some kind of a *model* to illustrate reverse innovation and/or organise results about it, be this model proprietary or referred to, implicit or explicit. Note that a *model* is understood in the sense of a *good example* here, i.e. as "something that a copy can be based on because it is an extremely good example of its type"³. This perspective is particularly warranted as reverse innovation has been extrapolated from a limited number of empirical anecdotes, especially from the one of General Electric (Table 3). A framework appropriate for organising the literature review needs to absorb the variance in individual models, i.e. to integratively model the individual models at a more abstract level; that is why we call it a meta-model. In order to derive such a meta-model, we started from the model of General Electric in Immelt et al. (2009) and Govindarajan and Trimble (2012), since both this model (Table 3) and these two

³ Cambridge Online Dictionary of British English, <http://dictionary.cambridge.org/>

sources (Table 4) are the widest diffused ones. Due to differences among the conceptualisations (Table 5), different models from remaining publications were treated as cases that need to be integrated, so the initial meta-model was repeatedly revised until it eventually matched all individual models.

Innovative processes inevitably precede any innovative outcome (Crossan and Apaydin, 2010), yet for the model of General Electric, it was crucial that the outcome additionally diffused internationally, from emerging to developed markets (Immelt et al., 2009; Govindarajan and Trimble, 2012). "[D]iffusion is defined as the way in which innovations spread, through market or non-market channels; without diffusion, an innovation will have no economic impact" (OECD, 2005: 82). As any other innovation, reverse innovation is thus a two-stage process, with an enterprise innovating in the first stage, and then diffusing the outcome in the second stage. Consequently, we stipulate first three elements in the meta-model of reverse innovation: innovation as a process, innovation as an outcome, and (international) diffusion of the latter.

In order to pursue reverse innovation, GE drew on subsidiaries previously established in China and India, developed and finally diffused the outcome itself; it did *not* pursue export or licencing. From this, we infer that the company must initially have engaged in foreign direct investment (FDI) as entry mode to both countries. This is in line with the observation that prior literature primarily sees MNEs as actors in reverse innovation (Table 5), since MNEs are per definition firms that establish foreign subsidiaries by engaging in FDI (Dunning and Lundan, 2008).

However, some papers (Ostraszewska and Tylec, 2015; Sinha, 2013; Snowdon et al., 2015; Vinekar, 2011) only indirectly, hardly or not at all specify the actor. In addition, Judge et al. (2015) depict an US start-up enacting reverse innovation, and indicate no particular entry mode (export, licensing or FDI; Dunning, 1979). Finally, some sources imply that FDI may *follow* the innovation process, rather than to precede it. For example, Hang et al. (2010) elaborate on "four

innovative firms in Asia that *became* multinational companies on the back of disruptive products developed specifically to address the needs of consumers in emerging economies" (p. 21, italic added). Consequently, in the meta-model, *FDI is an optional element* that precedes either reverse innovation as a process or the diffusion of the outcome.

Finally, the model of General Electric indicates geo-economic drivers (e.g. differences in development levels and economic growth rates) and various determinants of reverse innovation. Drawing on Crossan and Apaydin (2010), we categorise the latter either as individual (e.g. CEO's motivation to innovate), organisational (e.g. resource allocation, change of organisational culture) or processual (e.g. a project organisation of local growth teams in emerging markets). Other items from the core sample add no further categories but additional within-category determinants such as knowledge management (Borini et al., 2012, 2014; Li et al., 2013) at the organisational level.

In sum, the complete meta-model (Figure 5) indicates a necessary chronology. The diffusion stage inevitably needs an outcome to diffuse; the outcome is always a result of and hence preceded by innovative processes; innovation processes are determined by factors at individual, organisational, and processual level, while determinants are driven by geo-economic environment. However, this chronology may or may not translate into a waterfall sequence, since loops are generally possible; for example, iterations between innovation process and outcome may occur. As for FDI, it usually but not necessarily precedes innovation as a process, or at least the diffusion of the outcome. Though we recognise that FDI is also determined by factors such as strategic motives (Dunning and Lundan, 2008), this relationship is not indicated in the meta-model as determinants of reverse innovation and those of FDI are considered different even if they reside at the same level.

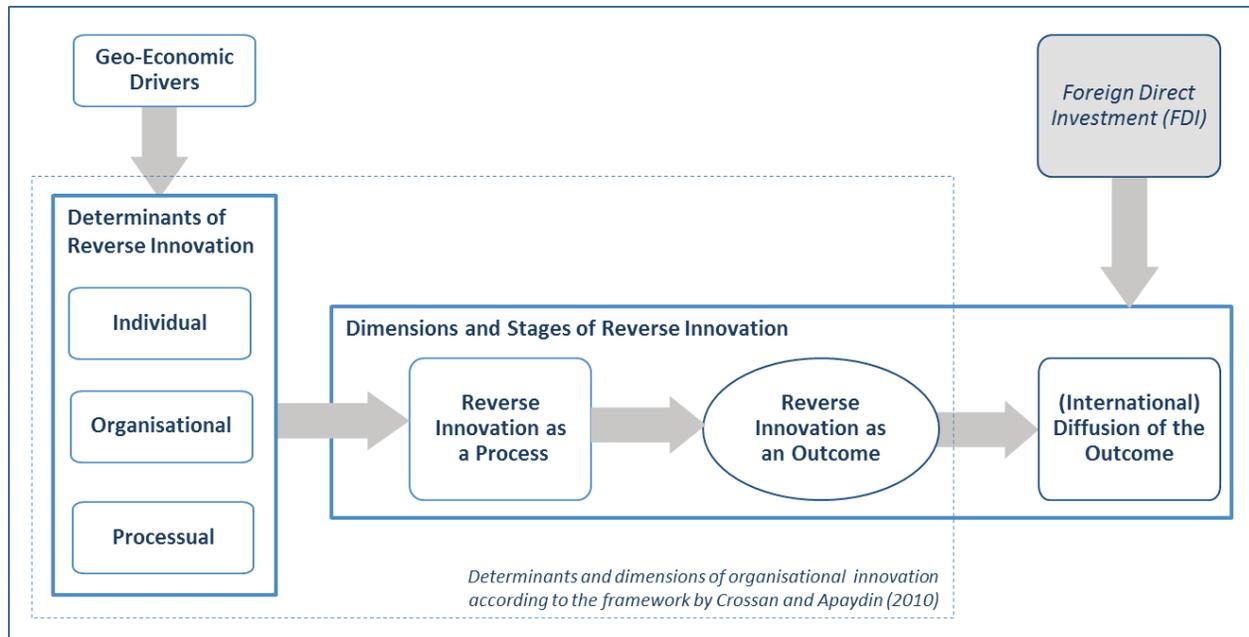


Figure 5: A meta-model of reverse innovation

Mirroring the meta-model on the framework of organisational innovation by Crossan and Apaydin (2010), we make three conclusions. First, the meta-model largely resembles the framework, though it is comparatively coarse-grained due to a by far smaller body of literature absorbed. This similarity has been intended in order to connect reverse innovation with prior research on organisational innovation in general. However, we argue that the similarity results not only from our intentions but also from the mere fact that reverse innovation is in its kernel (dotted area in Figure 5) a phenomenon that coincides with organisational innovation in general.

Second, Crossan and Apaydin define the scope of their work to exclude diffusion and environmental factors beyond organisational control. Yet exactly these are crucial to reverse innovation according to prior literature, which purports that the phenomenon is inseparable from geo-economic changes and (international) diffusion.

Third, previous understandings of reversal (Table 5) affect different elements of the meta-model, in which however no reversal as such is visible. This is explainable by Essay B: Reverse innovation actually resides *at the level of a new product or service* that is innovated in contradiction to

the actor's dominant innovation logic, so this is consequently not recognisable in a meta-model that reflects the organisational level. Since the dominant innovation logic is specific to the actor, reverse innovation is hence a template that necessarily needs customisation; what is reverse to one enterprise may be in line with the dominant innovation logic of another one. For instance, household appliances by Haier, a Chinese MNE studied by Hang et al. (2010), may or may not be disruptive as the authors purport, but this is in our understanding either way irrelevant as there is nothing *really* reverse in Haier's innovating as usually, for domestic market, and then diffusing the income internationally. Though some or all aspects of inversion mentioned in previous literature (Table 5) usually correlate with reverse innovation, and may be supportive of it, they are neither sufficient nor necessary criteria to define the concept.

4.3. Overview of Main Results

This section first lists (Table 6) and then briefly assesses main findings of all individual publications in the core sample. Subsequent sections identify and assess only findings that pertain to the respective meta-model element.

Item	Main Result
Baglieri et al. (2014)	Reverse innovation requires a radical transformation of roles, responsibilities and activities of the parent company and its subsidiaries.
Borini et al. (2012)	Reverse transfer of innovation from foreign subsidiaries to headquarters of emerging MNEs depends on entry mode, subsidiaries' age, strategic orientation of R&D and integration with the parent, and the entrepreneurial orientation of the MNE.
Borini et al. (2014)	Reverse innovation is "associated with the formation of centres of excellence in subsidiaries in emerging markets" (p. 163).
Brown and Hagel (2005)	Western MNEs associate emerging markets solely with labor arbitrage and economies of scale, and are hence vulnerable to disruptions by competitors from emerging markets. Western MNEs should rather innovate for lower-income consumers in emerging markets and use the outcome in new categories at home.
Corsi and Di Minin (2014)	Reverse innovations are disruptive innovations with a particular geographical dimension, i.e. disruptive innovations diffusing from emerging markets.
Corsi et al. (2014)	Reverse innovation may be accidental result of initiatives by foreign subsidiaries that finally threaten the parent's primary market and thus create internal resistance.

Item	Main Result
Govindarajan (2012)	Reverse innovation requires a radical change of Western MNEs' dominant logic, i.e. of the way how they approach innovation.
Govindarajan and Ramamurti (2011)	Reverse innovation is still a rare phenomenon, but it nevertheless may enrich mainstream theories of innovation and internationalisation.
Govindarajan and Trimble (2012)	In order to successfully pursue reverse innovation, best practices need be applied regarding strategy (innovate for emerging markets; diffuse outcome to other countries; observe emerging giants), organisation (move power and resources to emerging markets; create a particular organisational mind-set; use separate scorecards) and project-based implementation (commission local growth teams; leverage the company's global resource base; manage as disciplined experiments; p. 71-72).
Govindarajan and Trimble (2012b)	Innovators win in emerging markets, exporters lose. But "[a] loss abroad can lead to an even bigger loss at home" (p. 9).
Hang et al. (2010)	Firms pursuing reverse innovation must be receptive for resource constraints of targeted consumers in emerging markets, and develop managerial as well as R&D capabilities to meet aggressive price/performance ratios.
Immelt et al. (2009)	Western MNEs should innovate in and specifically for emerging markets, and subsequently diffuse the outcome back home. Reverse innovation is approach to both, tapping into potentials of emerging markets and inhibiting competitors raising from there, as these "emerging giants" could leverage on reverse innovation themselves.
Judge et al. (2015)	"By recognizing developing country users as lead users, designers can reveal latent needs and create globally disruptive innovations" (p. 1).
Kamp (2012)	Emerging markets can also become lead markets and "spark innovations [...] that lead to global sales and market domination" (p. 482); they will increasingly generate more advanced and high-end reverse innovations, instead of solely frugal ones.
Laperche and Lefebvre (2012)	Reverse innovation introduces next stage of globalisation of MNEs' R&D, which now needs to be performed upstream in emerging markets.
Li et al. (2013)	With increasing sophistication of emerging markets, knowledge spillovers between foreign and domestic firms diversify into reverse spillovers and reverse innovation.
Ostraszewska and Tylec (2015)	Reverse innovation takes a particular position vis-à-vis other kinds of innovation (disruptive, cost, Gandhian, jugaad, frugal, good-enough) in/for emerging markets.
Sartor and Beamish (2014)	Higher home-host country distances in informal institutions trigger uncertainty, which in turn induces lower level of organizational control of headquarters over innovation offshored to own subsidiaries or suppliers located in emerging markets.
Sinha (2013)	Reverse innovations may be conceptualized for the BoP and "are a result of cutting edge technology, common sense and ingenious use of local commodities with the price range that is affordable to a huge mass of consumers" (p. 69).
Snowdon et al. (2015)	Reverse innovation in healthcare systems is an opportunity for developed countries, and may be induced by targeted initiatives.
Vinekar (2011)	Indian tele-ophthalmology initiatives may be adapted by (firms from) developed countries, thus becoming a reverse innovation in healthcare.

Item	Main Result
von Zedtwitz et al. (2015)	Depending on which phases of the global innovation process take place in emerging and which in advanced markets, 5 types of strong and 5 types of weak reverse innovation may be distinguished.
Winter and Govindarajan (2015)	Reverse innovation "succeeds when engineering creatively intersects with strategy" (p. 83) and particular design principles are adhered to.
Zeschky et al. (2014a)	MNEs' ability to generate reverse innovation is independent of the location of the product mandate, but contingent upon development of frugal innovation capabilities through the location of design and development mandate in emerging markets.
Zeschky et al. (2014b)	Reverse innovation requires strategy and capabilities different from strategy and capabilities for other types of resource-constrained innovation (i.e. cost, good-enough, and frugal innovation).

Table 6: Main results by individual publication

In order to facilitate evaluating prior results from an overall perspective, we additionally group individual publications according to the focal element(s) of the meta-model (Table 7). Consequently, we observe that a comparatively small number of publications in the sample have addressed a variety of themes. Prima facie, this thematic diversity may appear as a positive contrast to the aforementioned uniformity of enterprises and country constellations. For four reasons, we nevertheless argue that centrifugal effects prevail. First, the pluralism of conceptualisations (Table 5) scatters the results and makes the whole a simple sum of its parts, if not less than that.

Second, we have observed a scarcity of empirically grounded studies (Figure 1) concomitant with repetitive mentioning of same empirical anecdotes (Table 3). Taken together with the variety of themes addressed, these observations indicate that the same limitedly reliable anecdotal evidence may have been squeezed out to achieve a marginal conceptual progress.

Third, already at this stage of the literature review, several gaps become evident – paradoxically gaps about themes that are fundamental rather than peripheral. While we will discuss the implications in more detail subsequently, we note at this point that *geo-economic drivers* are constantly but anecdotally purported to trigger reverse innovation, yet no source persuasively explains why this stimulus necessarily drives a strategic response exactly in this form, and not some other. Pri-

or literature is also mute about *individual determinants*, *portfolio management*, and *commercialisation*; regarding the latter, beneficial impacts of reverse innovation on business performance seem to have been taken for granted. Finally, *foreign direct investment* is mostly the base from which reverse innovation commences, yet not the main subject of any publication so far.

Meta-Model Element	Publications with Main Focus on the Respective Meta-Model Element (Multiple Entries)
Geo-economic drivers	<i>None</i>
Individual determinants	<i>None</i>
Organisational determinants*	<ul style="list-style-type: none"> • Mission, goals and strategy: Brown and Hagel (2005); Govindarajan and Trimble (2012, 2012b); Immelt et al. (2009) • Structure and systems: Baglieri et al. (2014); Borini et al. (2012, 2014); Sartor and Beamish (2014) • Resource allocation: Govindarajan and Trimble (2012); Immelt et al. (2009) • Organisational learning and knowledge management: Hang et al. (2010); Li et al. (2013); Zeschky et al. (2014a, 2014b) • Organisational culture: Govindarajan (2012); Govindarajan and Trimble (2012)
Processual Determinants*	<ul style="list-style-type: none"> • Initiation: Corsi et al. (2014); Govindarajan and Trimble (2012); Immelt et al. (2009); Judge et al. (2015); Snowdon et al. (2013) • Portfolio management: None • Development and implementation: Govindarajan and Trimble (2012); Immelt et al. (2009); Laperche and Lefebvre (2012) • Project management: Govindarajan and Trimble (2012); Immelt et al. (2009) • Commercialisation: None
FDI	<i>None</i>
Reverse innovation as a process	Borini et al. (2014); Brown and Hagel (2005); Govindarajan and Trimble (2012); Hang et al. (2010); Immelt et al. (2009); Judge et al. (2015); Laperche and Lefebvre (2012); Sinha (2015); Vinekar (2011); von Zedtwitz et al. (2015); Winter and Govindarajan (2015)
Reverse innovation as an outcome	Corsi and Di Minin (2014); Kamp (2012); Ostraszewska and Tylec (2015); Zeschky et al. (2014b)
Diffusion	Kamp (2012)
All/most elements	Govindarajan and Ramamurti (2011)

Table 7: Main results by individual meta-model element

*Sub-constructs according to Crossan and Apaydin (2010)

Fourth, though prior literature invokes a number of theories (cf. Section 4.9 for details), a majority of publications nevertheless remain largely phenomenological or best-practice oriented (e.g.

Brown and Hagel, 2005; Govindarajan, 2012; Govindarajan and Trimble, 2012, 2012b; Immelt et al., 2009; Judge et al., 2015; Winter and Govindarajan, 2015). Integrative approaches are rare and fail short of being conclusive: Govindarajan and Ramamurti (2011) provide an extensive agenda with regard to potential theoretical implications of reverse innovation, rather than any theory itself. A promising approach by von Zedtwitz et al. (2015) aims at a potentially integrating typology; in fact, however, it establishes a mere categorisation rather than any typology, as it unfortunately omits to predict the variance in any dependent variable (which is a necessary feature that distinguishes typologies from categories; Doty and Glick, 1994).

4.4. FDI: A Prerequisite for Reverse Innovation?

Although Govindarajan and Ramamurti (2011) recognise that reverse innovation may extend mainstream theories of internationalisation and FDI, these aspects have remained virtually unsearched so far. Most evidently, it is unclear why reverse innovation requires FDI as the entry mode at all, as the core sample implies. Some ongoing research (Winterhalter, 2015) and our Essay C rather suggest that the entry mode still depends on ownership, internalisation and location advantages (Dunning, 1979). Even if FDI is really warranted for some yet unpublished reasons, prior research remains mute on its impacts on developing host countries in the altered context of reverse innovation. Li et al. (2013) only propose that FDI-related knowledge flows between foreign MNEs and domestic firms in emerging markets ultimately diversify into reverse knowledge spillovers and reverse innovation. Govindarajan and Trimble (2012: 210) laconically note that some spillovers are good while "others are not so good", yet nevertheless purport unambiguously positive social effects of reverse innovation on emerging markets.

Even without reverse innovation, impacts of FDI on developing host countries are complex (Meyer, 2004) and subject to ongoing debates. According to dependency theory (Bornschiefer and

Chase-Dunn, 1985), MNEs are mere agents of underdevelopment; in contrast, neoclassical (Solow, 1956) and neoliberal (Friedman, 1962; Williamson, 1990) view generally advocate foreign capital infusion, while innovation systems approach only conditionally affirms its positive impacts (Blomström and Kokko 1998; Freeman, 1995; Lall, 1992; Lundvall, 1992; Lundvall et al., 2009). Empirical evidence has been mixed as well, ranging from clearly or largely negative impacts (Aitken and Harrison, 1999; Kathuria, 2000), over conditional (Bengoa and Sanchez-Robles, 2003; Borensztein et al., 1998; Zhang, 2001) to unambiguously positive (Liu, 2002). More recently, a meta-analysis by Meyer and Sinani (2009) attempts to reconcile prior empirical results, and proposes a U-shaped relationship between FDI impacts and income levels of host countries. FDI would hence have positive demonstration effects to local enterprises at a low level of income, lead to crowding out of indigenous firms in middle-income countries, but induce a dynamic competition with positive impacts in high-income host countries.

That all being said, we argue that *aggregated impacts* of the interaction of reverse innovation and FDI may depend on at least two factors disregarded so far, namely potential shift of strategic rationale and level at which innovation outcomes occur. First, ex-ante strategic goal of MNEs pursuing reverse innovation is to seek market. At a later point however, when the outcome is diffused internationally, the strategic intent for FDI can become ex-post efficiency-seeking, which is in turn considered more beneficial to the host country (Dunning, 1997: 220-221). Second, outcomes of innovation novel only to foreign MNEs (and not at the country level) indicate MNEs entering markets of local firms, as e.g. Unilever entered the market formerly served by Indian firms, (re-)innovated single-serve sachets and low-end detergents for India (Bhattacharya and Michael, 2008; Prahalad and Hart, 2002), and finally diffused the outcome to Europe (Subramaniam et al., 2015). In contrast to predictions by Meyer and Sinani (2009), reverse innovation

could hence crowd out local competition in both low and middle income host countries, i.e. be detrimental to every developing host country.

As for *marginal impacts* of reverse innovation, they may be of the same or opposite sign as the impacts of underlying FDI, thus having either augmenting or offsetting effect. Main challenge to studies on this topic is hence to isolate impacts of reverse innovation from other FDI-related impacts. Our contribution with this regard is Essay A, which aims at isolating and assessing social impacts of reverse innovation on the largest yet poorest socio-economic group in India (so called "Bottom of the Pyramid").

4.5. Reverse Innovation as a Process

Organisational innovation as a process is characterised by sub-dimensions such as driver (or stimulus), source, locus, and direction (Crossan and Apaydin, 2010). Several generations of models of innovation connect sub-dimensions in a particular way, e.g. by assuming a certain driver from which the process would flow in a specific direction (Hobday, 2005). Ever since the first generation model (technology-push; Schumpeter, 1911), later work challenged the respective dominant view by re-positioning the driver, source, or locus, or by revealing that the direction of processes in fact deviates or inverts. For example, second generation model (market-pull; Schmookler, 1966) inverted the prior technology-push by proposing that the main driver are in fact unsatisfied market needs.

As for reverse innovation, previous findings pertain mostly to its driver, source and locus, less to the direction, and hardly to a holistic model of the process. The *driver of reverse innovation* are virtually in unison needs of emerging markets that arise from their peculiarities, e.g. specific consumption preferences, income levels, required price/performance ratios, and infrastructural or regulatory conditions. For a majority of the sample, emerging markets are simultaneously the

geographic locus of innovation, though Zeschky et al. (2014a) suggest that the product mandate may be located elsewhere, and von Zedtwitz et al. (2015) relax the locational requirement to apply to single stages in the process only. For all items in the sample, the *organisational locus* is either the firm or its *intra*-firm network, the latter of which may include centres of excellence in emerging markets (Borini et al., 2014). The *source of reverse innovation* is the actor's global resource base (Immelt et al., 2009; Govindarajan and Ramamurti, 2011; Govindarajan and Trimble, 2012), or consumers from developing countries as lead users (Judge et al., 2015; Vinekar, 2011). Winter and Govindarajan (2015) extend the latter notion of the source, and include all stakeholders in developing countries as well as the match of engineering/design with strategy.

Direction of reverse innovation as a process has been specified only with regard to partial sequences so far, i.e. two consecutive stages that take place in developing respectively developed countries (von Zedtwitz et al., 2014), knowledge spillovers from local firms in emerging markets to foreign MNEs (Li et al., 2013), and organisational bottom-up sequence from subsidiaries, suppliers or R&D centers in emerging markets to headquarters (Baglieri et al., 2014; Borini et al., 2012, 2014; Laperche and Lefebvre, 2012; Sartor and Beamish, 2014). Potential *models of reverse innovation as a process* have been neglected so far. Only von Zedtwitz et al. (2015) draw on a complete, linear innovation model by Godin (2006), yet they do so in order to enable the conceptualisation of reverse innovation as a specific sequence of two stages within the process, rather than to establish a particular model of the process itself.

In sum, reverse innovation is perceived as a process by a number of publications in the sample (Baglieri et al., 2014; Borini et al., 2012, 2014; Laperche and Lefebvre, 2012; Li et al., 2013; Sartor and Beamish, 2014; von Zedtwitz et al., 2015). Nevertheless, only three of these actually define the reversal at processual level: as two consecutive stages that take place in developing respectively developed countries (von Zedtwitz et al., 2015) or as R&D performed *upstream* in

emerging markets (Baglieri et al., 2014; Laperche and Lefebvre, 2012). For Li et al. (2013) the reversal takes place rather at the level of FDI-related spillovers, and for Baglieri et al. (2014), Borini et al. (2012) and Sartor and Beamish (2014) at the firm-level, by reversing the flows between subsidiaries and headquarters. For a majority of publications (cf. Table 5), the inversion does not reside in the process whatsoever, but rather in flows of the *outcome* from developing to developed countries, which is in purported contradiction to the IPLC theory.

Consequently, we argue that prior findings on reverse innovation as a process suffer from at least three issues. First, the IPLC theory does not postulate any particular innovation process; instead, it takes an aggregated perspective on the diffusion of outcomes (cf. Section 4.7 and Essay B). Defining innovation processes as a reversal of the IPLC is hence simply not feasible.

Second, publications up to 2015 see the process of reverse innovation exclusively taking place within a single firm or its *intra*-firm network. It is only very recently that Judge et al. (2015) and Winter and Govindarajan (2015) refer to the same case in which users were employed as an external source of innovation. Yet literature on innovation in general proposes resorting to variety of sources beyond a firm's boundaries, e.g. to external technologies and knowledge (Chesbrough, 2003; West and Bogers, 2014; Wikhamn, 2013), equity stakes in innovative start-ups (Chesbrough, 2002), or even collaboration with competitors (Hamel et al., 1989). Particularly when innovating for emerging markets, enterprises have been advised to leverage on co-inventing custom solutions, developing relationships with local business partners, and local stakeholders such as government bodies and NGOs (London and Hart, 2004; Radjou and Prabhu, 2012).

Third and most general, the crucial role of an actor's business model as the frame for (re-)alignment of innovation processes and business strategy (Teece, 2010) is virtually unresearched so far. As long as the actor is not a start-up, innovation processes are finally contingent on prior strategic decisions, rather than designed in a vacuum. For example, reverse innovation

clearly requires a shift towards local responsiveness within the global strategic mix (Bartlett and Ghoshal, 1989), which will likely collide with the goal to achieve the economies of scale.

4.6. Reverse Innovation as an Outcome

Characteristics of reverse innovation as an outcome are collaterally mentioned throughout the core sample, yet are the main subject of only few publications (i.e. Corsi and Di Minin, 2014; Kamp, 2012; Ostraszewska and Tylec, 2015; Zeschky et al., 2014b). Table 8 summarizes prior positioning with regard to some major classifications of the outcome of innovation in general.

Classification	Characteristics of reverse innovation as an outcome
Form: Product, service, processes, organisation, or business model (Crossan and Apaydin, 2010; EC, 1995)	Product (most publications); additionally/alternatively: Service (Snowdon et al., 2015; Vinekar, 2011); Product or service (Govindarajan and Trimble, 2012); Processes (Brown and Hagel, 2005); Intersection of business model and organisation (Zeschky et al., 2014a).
Magnitude: Radical versus incremental (OECD, 2005)	Radical (Immelt et al., 2009; Ostraszewska and Tylec, 2015); Potentially radical (Kamp, 2012; von Zedtwitz et al. 2015)
Disruptiveness: Disruptive versus sustaining (Christensen, 1997; Christensen and Raynor, 2003)	Disruptive (Brown and Hagel, 2005; Hang et al., 2010; Immelt et al., 2009); Disruptive with the geographic origin of diffusion necessarily in emerging markets (Corsi and Di Minin, 2014)
Dominant design conformity (Anderson and Tushman, 1990)	Challenging the dominant design (Judge et al., 2015; Winter and Govindarajan, 2015); Introducing new dominant design (Kamp, 2012)
Sophistication and other classifications (own compilation)	<ul style="list-style-type: none"> • Affordable and robust without excessively compromising on quality; based on novel technologies (Govindarajan and Trimble, 2012; Sinha, 2013; Winter and Govindarajan, 2015) • Same characteristics as cost, good-enough, or frugal innovation (Ostraszewska and Tylec, 2015) • Presently frugal, prospectively high-end (Kamp, 2012) • Sub-type of resource-constrained innovation, like cost, good-enough and frugal innovation (Zeschky et al., 2014b)

Table 8: Characteristics of reverse innovation as an outcome

Classifications of reverse innovation as an outcome are arguably of practical importance, particularly if linked to managerial implications of the underlying classification system. However, theoretical implications of comparisons with related concepts – such as Gandhian (Prahalad and

Mashelkar, 2010), cost (Williamson, 2010), or jugaad innovation (Radjou et al., 2012) – remain unclear, as this whole stream of terms still lacks stable theoretical fundamentals anyway (Cunha et al., 2014). Unresolved contradictions also occur; for Kamp (2012), Ostraszewska and Tylec (2015) and Zeschky et al. (2014b), "frugal" characterises the sophistication of the outcome, but it is considered the innovation mode in environments in which affluent customers are scarce by Cunha et al. (2014). Finally, the question at which level (OECD, 2005) reverse innovation as an outcome occurs has not yet been conclusively addressed. Prima facie, the publications in the core sample individually imply at least the country level, but the firm level on overall. For example, portable ultrasound devices for China similar to those of GE (a US MNE) were also innovated by ACorp (an anonymous MNE from the UK; Zeschky et al., 2014a). Note that the level at which the innovation outcome occurs may alter the impacts on developing host countries (Section 4.4).

4.7. Diffusion

For a majority of sources in the core sample (cf. Table 5), reverse innovation is conceptually inseparable from the diffusion of the outcome from emerging to developed markets, which is in supposed contradiction to the IPLC theory (Vernon, 1966; 1979). In fact, for Brown and Hagel (2005), Corsi and Di Minin (2014), Govindarajan and Ramamurti (2011), Hang et al. (2010), Immelt et al. (2009), Kamp (2012), Sinha (2013) and Zeschky et al. (2014b), this mere diffusion path seems the sufficient criterion to define (the inversion in) reverse innovation. There is little objection to this notion within the sample, explicitly only from von Zedtwitz et al. (2015) and implicitly by Borini et al. (2014) and Laperche and Lefebvre (2012), all of whom adopt a process-based perspective rather than the diffusion-based one. Remaining publications in the sample (Baglieri et al., 2014; Borini et al., 2012; Li et al., 2013; Sartor and Beamish, 2014) tacitly conceptualise reverse innovation their own way, as flows of capabilities, knowledge or technology

from subsidiaries, suppliers or competitors to headquarters of foreign MNEs. In other words, a majority of publications in the sample take the diffusion-based perspective for granted, while the remaining large minority consider this perspective as irrelevant. This is a possible explanation why only one publication, namely Kamp (2012), sets its research focus on diffusion. While holding the claim of diffusion-based inversion relatively to the IPLC, Kamp additionally draws on lead-market theory (Beise, 2004). Lead markets pioneer new dominant designs and "can help companies to develop global innovations" since "innovations that have been successful [...] in lead markets have a higher potential of becoming adopted world-wide" (ibid: 998). According to Kamp (2012: 482), particularly China and India have potential to become lead markets and "spark innovations and product developments that lead to global sales and market domination". Consequently, emerging markets would increasingly generate more advanced and high-end reverse innovations, instead of solely frugal ones.

Though we do not object to the idea that emerging markets may become lead markets in some industries and/or product groups, we distance ourselves in general from conceptualisations of reverse innovation relatively to phenomena in enterprises' geo-economic environment, and in particular from taking the IPLC theory as the point of reference for the inversion. As we note in Essay B, the levels of analysis in the IPLC theory and reverse innovation are incompatible, hence hardly contrastable. The IPLC theory takes an aggregated economic perspective so as to overcome the Leontief (1953) paradox, i.e. the inadequacy of previous theories of international trade and FDI flows. Quite differently, for reverse innovation, the level of analysis is the acting enterprise, while the unit of analysis is a new product or service that is being developed in contradiction to the actor's dominant innovation logic.

4.8. Drivers and Determinants of Reverse Innovation

Geo-economic drivers and individual determinants of reverse innovation have been largely neglected so far; in contrast, organisational and processual ones have been frequently addressed, with some gaps nevertheless remaining (cf. Table 7). In this section, we first summarise existing results on organisational and processual determinants, and respectively discuss autonomous implications. Cross-level implications, particularly in context of identified gaps, are discussed towards the end of this section.

Organisational Determinants: Several publications (particularly Brown and Hagel, 2005; Govindarajan and Trimble, 2012, 2012b; Immelt et al., 2009) emphasise a twofold strategic importance of reverse innovation for Western MNEs. On the one hand, it represents a means of exploiting potentials of both mainstream markets in emerging economies and niche markets in developed ones. On the other, Western MNEs may pursue reverse innovation for defensive reasons as well, to inhibit competitive threats from rapidly growing MNEs from emerging markets (so called "emerging giants"; Khanna and Palepu, 2006). In consequence, reverse innovation entails a shift towards more local responsiveness within the transnational model (Bartlett and Ghoshal, 1989), or even going beyond it (London and Hart, 2004). Successful implementation of reverse innovation requires allocating resources and power to emerging markets (Govindarajan and Trimble, 2012; Immelt et al., 2009), organisational learning about local customers and ways to meet their needs (Hang et al., 2010; Zeschky et al. 2014a, 2014b), absorbing reverse knowledge spillovers from local firms (Li et al., 2013) and re-distribution of roles between subsidiaries and headquarters (Baglieri et al., 2014; Borini et al., 2012, 2014), the latter of which is co-determined by informal institutional differences between developed countries and emerging markets (Sartor and Beamish, 2014). Eventually, reverse innovation requires a change of organisational culture and dominant logic of the actor (Govindarajan, 2012; Govindarajan and Trimble, 2012).

As long as the actor is a (large) MNE from the Triad, these findings appear consistent. However, for all other players – not large, not from the Triad and/or not MNEs – the applicability is in fact questionable, as these players will have different competitive positions (Burger-Helmchen et al., 2013). For instance (cf. Essay C), small and medium sized enterprises will be less constrained by prior dominant logic and may follow a global approach (Madsen and Servais, 1997) or reverse innovation itself as a part of the start-up business model (as the US start-up in Judge et al., 2015), but may suffer from scarce resources in general (Knight and Cavusgil, 2004) or limited finance in particular (OECD, 2013).

Processual Determinants: According to extant literature, initiation of reverse innovation endeavours may go back to decisions made at the organisational level of the firm in question (Govindarajan and Trimble, 2012; Immelt et al., 2009), requirements of lead-user groups in emerging markets (Judge et al., 2015), targeted initiatives by other stakeholders in developed countries (Snowdon et al., 2013), but also accidentally result from initiatives by subsidiaries (Corsi et al., 2014). As long as the actor is a (large Western) MNE, new products may be developed by R&D centres (Laperche and Lefebvre, 2012), centers of excellence (Borini et al., 2014), or project teams in emerging markets ("local growth teams"; Govindarajan and Trimble; 2012; Immelt et al., 2009). As reverse innovation triggers fear of cannibalisation, it is likely to face internal resistance that need be managed at organisational level (Corsi et al., 2014; Govindarajan, 2012; Govindarajan and Trimble, 2012; Immelt et al., 2009).

What has been researched on processual determinants so far equally appears mainly applicable to (large) MNE from the Triad, see above. Further issues result from aspects that have not been researched at all, namely *commercialisation* and *portfolio management*. Certainly, Immelt et al. (2009) report on GE's US\$ 278 million of gross revenues from portable ultrasounds in 2008, yet they do not mention net profit from this product line nor the fact that these devices accounted for

only 0.15% of \$183 billion in total revenues which the company reported that year (General Electrics, 2009). In turn, this raises questions about *portfolio management*, i.e. about "making strategic choices – which markets, products, and technologies [to] invest in", and hence about appropriate resource allocation and project selection (Cooper et al., 1999: 333). With this regard, the research community has not yet learned whether GE abandoned or postponed other projects so as to pursue reverse innovation, nor whether (and if so how much) the company has forgone by deciding that way. In other words, isolated data purport positive marginal effects of reverse innovation on business performance, but studies on aggregated effects are yet to come – at least as long as the actor is a firm that *shifts* towards reverse innovation. In case of start-ups that pursue reverse innovation from the very inception (Judge et al., 2015; Essay C), positive overall effects may be arguably assumed by the mere survival of their initial business model.

Geo-economic drivers have been purported to trigger reverse innovation throughout the core sample. Doubtlessly, the global business environment has been changing, e.g. economic power has been shifting towards emerging markets (e.g. Jain, 2006; Kose and Prasad, 2010; OECD, 2010; PWC, 2013). However, non-existence of reliable studies on commercialisation and diverging conceptualisations being given, we argue first of all that it is yet unclear why exactly reverse innovation would be *the* response to these global changes and, if it all, to whom. If we take the perspective of large Western MNEs such as GE, our Essay B is the first study that attempts to explain why geo-economic drivers determine innovating for emerging markets *first* and then bringing the outcome back to traditional ones, instead of going the other way round. As the needs of Indian main and the US niche market for low-end medical devices had coexisted, GE basically achieved a dual disruption, new market disruption in India and low-end disruption in the US (Christensen and Raynor, 2003). However, the firm could have exported US low-end disruption to India instead of importing Indian new market disruption to the US.

Applying the typology by Miles et al. (1978), we additionally reveal a mismatch underlying the strategic response that the "fathers" of reverse innovation propose to Western MNEs. Initially, they suggest a pure "prospector" strategy: as the environment is rapidly changing, aggressive new product development and depart from previous glocalisation are necessary so as to exploit new opportunities ("reverse innovation isn't optional; it's oxygen"; "[glocalisation] makes reverse innovation impossible"; Immelt et al., 2009: 59, 60). Few years later however, two of these authors (Govindarajan and Trimble, 2012) purport that a "global corporation must learn to execute reverse innovation and glocalisation *simultaneously*" (p. 38, italic borrowed). The impossible has hence become the advisable; in fact, the advisable mixes in glocalisation as a "defender" strategy, which correlates with the perception of the environment as stable. This paradox is partly explained by the reconceptualization proposed by Essay B: reverse innovation basically suggests following "prospector" strategy at the level of a new product or service, but "defender" at the firm level. Evidently, this is a tremendous challenge, as the dominant innovation logic is simultaneously followed and questioned. Besides, the absence of conclusive studies on commercialisation being given, it is yet open to debate whether taking on this challenge is worthwhile and to whom. As for *individual determinants*, the role of the CEO in strategy formulation and resource allocation is often mentioned (e.g. Immelt et al., 2009; Govindarajan and Trimble, 2012). This implies that leadership plays for reverse innovation a role as important as for innovation in general (Mumford and Licuanan, 2004). Yet a lack of evidence about beneficial impacts on business performance being given, this also raises the question to what extent personalised interpretations of the strategic situation as a function of executives' experiences, values, and personalities (upper echelon theory; Hambrick, 2007; Hambrick and Mason, 1984) determine the decisions to engage in reverse innovation. However, the link between top managers' individual characteristics and a firm's choice to pursue reverse innovation remains virtually unresearched so far.

4.9. Theoretical Perspectives

In this section, we finally evaluate the core sample based on theoretical standpoints taken towards reverse innovation (Table 9). Three indicative groups of publications have been distinguished: those that set up a theoretical framework including a particular theory (marked with an asterisk*), those that explicitly invoke a theory without setting up any theoretical framework (normal print), and those that *strongly* imply a theory without mentioning it explicitly (*italic*). Evidently, the last group is a matter of our judgment and open to different interpretations.

Theory	Theoretical framework of*, Invoked or <i>Implied</i> by (multiple entries)
Contingency theory	Borini et al. (2014)*
Disruptive innovation theory	<i>Brown and Hagel (2005)</i> ; Corsi and Di Minin (2014)*; Govindarajan and Ramamurti (2011); <i>Govindarajan and Trimble (2012, 2012b)</i> ; <i>Immelt et al. (2009)</i> ; Hang et al. (2010); Ostraszewska and Tylec (2015); Sinha (2013); Zeschky et al. (2014a)
Evolutionary economics	<i>Govindarajan and Ramamurti (2011)</i> ; Li et al. (2013)
Institutional theory	Sartor and Beamish (2014)*
International Product Life Cycle	Borini et al. (2014)*; <i>Brown and Hagel (2005)</i> ; Corsi and Di Minin (2014)*; <i>Immelt et al. (2009)</i> ; Kamp (2012)*; Govindarajan and Ramamurti (2011); Govindarajan and Trimble (2012); von Zedtwitz et al. (2015); Zeschky et al. (2014a)
Lead market theory	Kamp (2012)*; <i>Winter and Govindarajan (2015)</i>
Lead user theory	Govindarajan and Ramamurti (2011); Judge et al. (2015)*; <i>Winter and Govindarajan (2015)</i>
Resource based view	Borini et al. (2012); <i>Govindarajan and Ramamurti (2011)</i>
Transaction cost theory	Sartor and Beamish (2014)*
<i>None or unclear</i>	Baglieri et al. (2014); Corsi et al. (2014); Govindarajan (2012); Laperche and Lefebvre (2012); Snowdon et al. (2015); Vinekar (2011); Zeschky et al. (2014a)

Table 9: Theories invoked by publications in the core sample

Overall, prior research has employed a variety of theoretical lenses to study reverse innovation, which is consistent (but *not* identical) with different perceptions of the reversal. Remaining differences between Table 5 and Table 9 result from the fact that several publications *describe* some

inverting aspects of the phenomenon referred to, rather than to invoke a particular theory to position the inversion. For instance, Ostraszewska and Tylec (2015) apparently perceive the inversion in innovations flowing from developing to developed countries, yet do not explicitly position this flow relatively to the IPLC. Instead, they describe the characteristics of reverse innovation as an outcome by drawing on the theory of disruptive innovation. In contrast, some publications *do invoke* a particular theory to define the reversal, but not so to frame the results. For example, von Zedtwitz et al. (2015) explicitly position reverse innovation as the opposite to the IPLC, but do not indicate within which theoretical framework to position their categorisation of reverse innovation as a process.

Not surprisingly, theories most employed in some way are the IPLC (Vernon, 1966; 1979) and disruptive innovation theory (Christensen, 1997; Christensen and Raynor, 2003). Explicitly or implicitly, the IPLC is a frequent point of reference for the reversal, while disruptive innovation theory has been often employed to characterise the outcome of reverse innovation (Table 8). Equally not surprising but more unfortunate is the fact that more than a quarter of the core sample does not allow for any unambiguous recognition of the theoretical lens employed, while only few publications set up an explicit theoretical framework for the research being performed. As most publications in the latter group are very recent, this observation is at least in line with the (emerging) trend towards more empirical and more integrated publications observed in Section 3.

That being said, we argue that major issues correlate with gaps in prior literature, or respectively result from a tacit mismatch between main results achieved and theoretical perspectives taken. Regarding the former, the link between top managers' individual characteristics and reverse innovation has not yet undergone any theoretical scrutiny, which correlates with the absence of studies on individual determinants of reverse innovation (Table 7, Section 4.8). According to Crossan and Apaydin (2010), a promising theoretical perspective here would be the upper echelon theory

(Hambrick and Mason, 1984), while our Essay C proposes adding self-concept maintenance theories (Crisp and Turner, 2010) to the theoretical framework.

Regarding the latter, main results of several publications (Baglieri et al., 2014; Govindarajan, 2012; Hang et al., 2010; Zeschky et al., 2014a, 2014b; cf. Table 6) touch on dynamic capabilities (Eisenhardt and Martin, 2000; Teece, 2007), but this perspective has not been explicitly taken so far. As we note in Essay B, however, an enterprise's response to the shift of the stimulus to innovate towards emerging markets requires dynamic capabilities, that is, "the allocation, reallocation, combination, and recombination of resources and assets" (ibid, p. 1341).

5. Literature Review: Conclusion

Looking back on prior ten years of management thinking, a group of Harvard Business Review editors declared in 2010 a list of top management concepts of the decade, or even the "*most influential management ideas of the millennium (so far)*"; (Kirby, 2010; italic borrowed). Of twelve concepts listed, reverse innovation has been ranked eleventh, for "the maturation of the concept of globalization, particularly with regard to emerging economies" (ibid). Additionally, the book on reverse innovation by Govindarajan and Trimble (2012) has been named one of the best business books for that year by the *strategy+business* magazine (Holly, 2012). This appreciation is likely one of the reasons why Vijay Govindarajan, co-inventor of the concept and co-author of most frequently cited sources on reverse innovation (Table 4), was ranked 3rd respectively 5th business thinker by "Thinkers 50" in 2011 and 2013, ahead of e.g. Michael Porter, Henry Mintzberg and Henry Chesbrough. According to its own website (www.thinkers50.com), Thinkers 50 is the "leading independent authority" and "first-ever global [biennial] ranking" of living "business thinkers" or even "gurus". Winners of rankings have been Peter Drucker (in 2001 and

2003), Michael Porter (in 2005), Coimbatore Krishnao Prahalad (in 2007 and 2009) and Clayton Christensen (in 2011 and 2013).

That being said, one might arguably challenge Harvard Business Review's authority to declare the *globally* most important management concepts. Given that most persons ranked by Thinkers 50 (41 in 2011) are from or based in the United States, United Kingdom or Canada, one might also question *for whom* are those the most influential business thinkers. Nevertheless, such doubts would not change the fact that the concept of reverse innovation has been widely acknowledged for its practical relevance – at least within an important scope consisting of predominantly English speaking, developed North-Atlantic countries.

Practical relevance of reverse innovation notwithstanding, our review has revealed a number of issues and gaps in the literature on this topic. Especially diverging conceptualisations, scarcity of theoretically framed approaches, as well as the absence of publication on individual determinants, models of reverse innovation as a process, commercialisation, and impacts on developing host countries are top themes for a research agenda going well beyond the one by Govindarajan and Ramamurti (2011). Considering the novelty of the research stream, these gaps in the literature are more understandable than the lack of academic maturity of what *has* been published on reverse innovation so far (Cunha et al., 2014). Particularly the very inception of the concept was characterised by ill-conducted research, detached from pertinent streams of management literature, and based on very few empirical anecdotes rather than empirically grounded conceptual results, all of which in turn made reverse innovation emerge in a fragmented and inconclusive manner. Overall, we argue that particularly a good deal of early research on reverse innovation has the characteristics of what Huff (2000) neutrally calls "Mode 2" production of knowledge, and Anderson et al. (2001: 393-394, *italic borrowed*) rather pejoratively "Popularist Science" (cf. Figure 6):

"Where practical relevance is high but methodological rigour low, Popularist Science is generated (Quadrant 1). Studies falling within this category address a theme widely recognized as relevant, but fail to do so with sufficient rigour to permit any reliance upon their findings. [...] It is typically executed where fast-emerging business trends or management initiatives have spawned ill-conceived or ill-conducted studies, rushed to publication in order to provide a degree of legitimacy and marketing support."

However, as this kind of research on reverse innovation seems to be driven by the demand from the market for knowledge (Huff, 2000), we concur with Hodgkinson et al. (2001) that its wholesale abandonment is less important than restoring the balance in favour of "Pragmatic Science". Exactly as "Popularist Science", "Pragmatic Science" (Anderson et al., 2001; Hodgkinson et al., 2001) – or "Mode 1.5" approach to knowledge production in words of Huff (2000) – is of high practical relevance, but it is simultaneously characterised by high theoretical and methodological rigour (Quadrant 2, Figure 6).

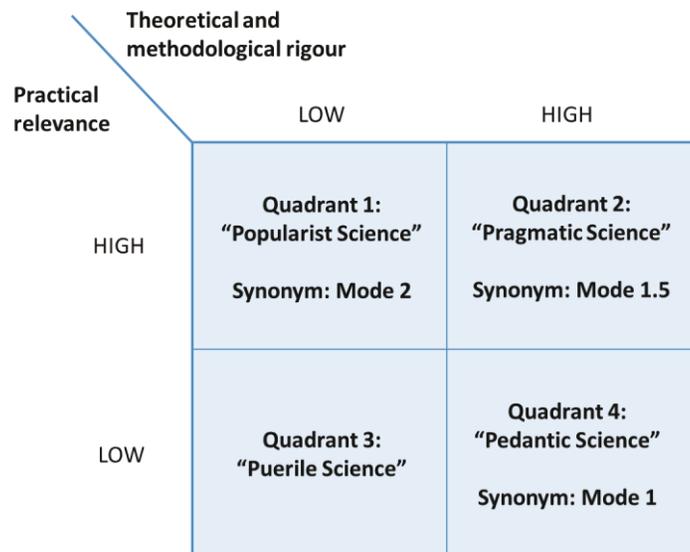


Figure 6: Fourfold typology of research

Sources: Anderson et al. (2001:394) as adapted by Hodgkinson et al. (2001: S42); modes from Huff (2000) added

There are signs that the recent research on reverse innovation has been attempting to do exactly this, i.e. to restore the balance towards "Pragmatic Science". The trends identified by our literature review are recent and thus not yet conclusive, but they justify at least a cautious optimism as

they seem to indicate an emerging shift towards a higher share of rigorous, empirical, integrated, and/or theoretically framed work. This thesis is our attempt to contribute with this regard.

6. Thesis Essays in Common Perspective

6.1. Overall Thesis Objective

In line with the observation by Vives et al. (2010) that emerging markets as the new context of innovation are presently underresearched, our systematic review has revealed a number of gaps in extant literature on reverse innovation, primarily with regard to geo-economic drivers, individual determinants, models of innovation processes, commercialisation, and impacts on developing host countries. Additional weaknesses of this body of literature result particularly from diverging conceptualisations, detachment from influential streams of management literature, as well as from a lack of diversity regarding focal enterprises and country constellations.

Consequently, *overall objective of the doctoral thesis as a whole has been to contribute to remedying weaknesses of and filling gaps in extant literature on reverse innovation.* While this overall objective basically mirrors issues and gaps, potential research questions with this regard abound. The selection of those that have been ultimately addressed had hence resulted from both, the author's assessment of priority and research philosophy. The following two subsections hence first explicitly commit to the research philosophy underlying the thesis as a whole, and to the general approach taken towards it. Subsequently, we state the essays' research questions and objectives, and explain their selection from the perspective of either or both, priority perceived and research philosophy followed. Remaining subsections respectively address essays' research design, ethical considerations, and provide publication notes, with which the thesis transitions to the essays.

6.2. Research Philosophy

The research philosophy underlying this thesis as a whole may be characterised as a blend of critical realism and pragmatism. On the one hand, the author's fundamental beliefs largely concur with those of critical realism (Table 10). On the other hand, however, the author argues that the ultimate determinant of the epistemology, ontology and axiology should be the respective research question, rather than mere beliefs (pragmatism; Saunders et al., 2009: 109).

Fundamental belief	Critical realism
Ontology: What is the nature of reality	Reality exists independently of human thoughts, beliefs or knowledge of its existence, yet human interpretations and social conditioning affect the reality observed.
Epistemology: What constitutes acceptable knowledge	Observable phenomena provide credible data and facts, but may create sensations which are open to misinterpretation.
Axiology: What is the role of values in research; What is researcher's stance	Research is value-laden; the researcher is biased by world views, cultural experiences and upbringing. Value-laden and etic
Data	Observations, judgements, and interpretations; quantitative and/or qualitative
Focus	Causal mechanisms identified via fallible observations

Table 10: Fundamental beliefs of critical realism

Sources: Combined from Rousseau et al. (2008: 486), Saunders et al. (2009: 119) and Wahyuni (2012: 70).

6.3. Approach

Given the novelty of reverse innovation, coupled with a small body of related literature characterised by various gaps and weaknesses, deductive approach is hardly a reasonable choice for the present thesis. Instead, we concur with Saunders et al. (2009: 127), who note:

"With research into a topic that is new, is exciting much debate, and on which there is little existing literature, it may be more appropriate to work inductively by generating data and analysing and reflecting upon what theoretical themes the data are suggesting."

We hence *generally* adopt inductive approach and – among others – explicitly aim at identifying linkages between reverse innovation and major streams of management literature, which is in

turn reflected in essay's objectives (Table 11). Note however that Essay C nevertheless mixes in the deductively based approach of explanation building so as to reduce project risk by research design (Section 6.5).

6.4. Essays Selection, Research Questions and Objectives

The selection of *Essay A* goes back to the author's axiological beliefs and commitment to innovation that benefits both, business and society. This essay therefore follows the claim that reverse innovation may benefit Western MNEs by simultaneously serving as "an instrument for solving some of the world's most vexing social problems" (Govindarajan and Trimble, 2012: 192; echoed e.g. in Sinha, 2013). These claims stand in contrast to prior literature which provides no convincing evidence (Karnani, 2007) that Western MNEs could simultaneously increase business performance and help eradicating poverty by targeting the poorest segments of emerging markets ("the Bottom of the Pyramid Proposition"; Prahalad, 2005). Additionally, Essay A addresses the gap about the interaction of reverse innovation and FDI, as it aims at isolating social impacts of reverse innovation from other FDI-related impacts.

Essay B results from the author's perception of diverging conceptualisations as the most detrimental and most urgent weakness of extant literature. This weakness finally makes reverse innovation limitedly actionable for practitioners and insufficiently robust to absorb further research. As our literature review has shown, diverging conceptualisations scatter publications along different dimensions of innovation and notions of underlying reversal, thus diminishing reliability of extant findings and their suitability for conclusive syntheses. Note that Essay B is equally linked to the author's fundamental belief about epistemology: observable phenomena (which reverse innovation is) provide credible data and facts, but may create sensations open to misinterpretation (which also seems to have been the case with reverse innovation).

Finally, *Essay C* addresses two gaps in extant literature, about individual determinants and processual models, coupled with predominant notion of reverse innovation as a process taking place within a firm's boundaries – although innovation literature generally suggests the opposite, i.e. resorting to some kind of external leverages (e.g. Chesbrough, 2002, 2003; London and Hart, 2004). This essay also relates to the author's beliefs about epistemology, namely the belief that human interpretations and social conditioning may affect the reality observed.

Each of the essays constituting the thesis consequently addresses a particular research question; in turn, answering the respective research question is the *primary* objective of each essay. However, each essay equally attempts to achieve further objectives, which generally correspond to the thesis' overall objective and inductive approach taken (Table 11).

Essay	Research Question	Objectives
A	Which (positive) social impacts, if any, has reverse innovation had on the largest but poorest socio-economic group in India ("the Bottom of the Pyramid")?"	<ul style="list-style-type: none"> • To identify social impacts of reverse innovation on the Bottom of the Pyramid • To isolate impacts of reverse innovation from other FDI-related impacts, and to assess them • To add a piece of evidence to the complex relationship between innovation, poverty and inequality in the context of reverse innovation
B	What is the concept of reverse innovation <i>really</i> about?	<ul style="list-style-type: none"> • To propose a reconceptualization actionable by any enterprise, irrespectively of its size, equity structure, origin, or country constellation in which it operates • To identify the linkages between the re-positioned concept and major streams of related managerial literature • To achieve a backward-compatibility, i.e. to largely accommodate previous literature on reverse innovation
C	Why and to which external leverages of reverse innovation do enterprises (not) resort?	<ul style="list-style-type: none"> • To explain why and to which kind of external leverages enterprises do (not) resort in reverse innovation endeavours • To broaden the empirical database on reverse innovation by focusing on previously understudied actors and country constellations

Table 11: Research questions and objectives by essay

Note that the labels and order of essays (A, B, C) do not imply any priority among each other, but merely the individual maturity with regard to the publication process (cf. Section 6.6). However,

the selection of essays included in the thesis *does* imply a higher priority in comparison to author's other contributions about reverse innovation that have not been included in the thesis. In addition, there is a chain of insights spreading over thesis essays. While Essay A primarily aims at identifying and assessing social impact of reverse innovation on the BoP in India, it also collaterally observes that that the concept has been emerging in a fragmented and diverging manner. Essay B specifically follows up on diverging conceptualisations, and among others explicitly proposes re-positioning reverse innovation as a process that may span more than one enterprise. In turn, Essay C focusses on previous notion of reverse innovation as a closed process, and links this with individual determinants of external leverages resorted to within innovation process.

6.5. Research Design by Essay

Essay A is exploratory, and according to the typology by Thomas (2011) illustrative. It primarily aims at rigorous exploration of social impacts of reverse innovation ("what is happening"; Robson, 2002: 59), which are according to wholesale assertions by Govindarajan and Trimble (2012) large and positive. As the actor implied by Govindarajan and Trimble is a Western MNE, we infer that it must have had to initially engage in FDI. Consequently, *aggregated* social impacts will come either from FDI, from reverse innovation, or from their interaction. However, we primarily aim at assessing *marginal* impacts of reverse innovation, which means impacts that need to be isolated from other FDI-related ones. Essay A is hence performed in three steps. First, a four-stage process model of reverse innovation from the BoP is conceptualised, with FDI taking place in the first stage. Second, an assessment framework for social impacts is derived and adapted from the previous work of London (2009). Third, based on secondary data from prior literature, this framework is applied along the four stages to assess the social impacts of reverse innovation on the BoP in India. The unit of analysis are hence reverse innovation endeavours by

developed country MNEs, while the level of analysis is the Indian BoP. India has been chosen purposefully as the setting for the study, since this country represents the geographical intersection for the bulk of literature on both the BoP proposition and reverse innovation. Its recent economic growth combined with the reality of persisting poverty (INSEAD, 2011) potentially renders India the ideal place for Western MNEs to achieve both, significant business and large social benefits. In fact, India might even be the only country where the BoP proposition yields positive results for both the society and MNEs (Landrum, 2007). However, though our results indicate some doubtlessly positive social impacts, we find no evidence to support the claims that reverse innovation results in large-scale prosperity and poverty reduction. In line with Cozzens and Kaplinsky (2009), we therefore conclude that poverty and inequality may possibly trigger reverse innovation, but that reverse innovation hardly reduces poverty from which it has resulted. As a research avenue of particular interest, we propose studying reverse innovation endeavours that employ the BoP as a source of efficiency, and hence contribute to building domestic capabilities as a more likely path towards prosperity and poverty reduction (Lundvall et al., 2009).

Essay B is a conceptual paper with explanatory purpose. It follows up on the insight that reverse innovation has been evolving as a fragmented, instable concept, in which the settings of empirical illustrations used to establish the concept have been fallaciously – and divergently – echoed as the concept itself. The essay first identifies five roles subordinate to reverse innovation (Actor; Stimulus to innovate and the origin of innovation; Final destination of innovation; Stage or environment; Actual reversal involved) along with the evolvement of their individual interpretations. In order to re-interpret these five roles and establish causal relationships, illustrative secondary data and inductive reasoning are applied. The level of analysis is the acting enterprise, but the unit of analysis is a new product or service contradicting the actor's dominant innovation logic at the firm level. All re-interpreted roles are subsequently synthesised to propose re-positioning of

reverse innovation as a template customisable to any particular enterprise, its old and a new primary market for innovation. Ultimately, our total distance framework positions reverse innovation relatively to innovation "by default", glocalisation and "domestic" disruptive innovation along dimensions exogenous (cultural, administrative, geographic, economic; Ghemawat, 2007) and endogenous (market knowledge, technology, business model) distance. Based on this, we suggest an explanation for e.g. why GE developed its low-end medical devices for Asian emerging markets and diffused them from there to the US, rather than the other way round. As promising perspectives towards reverse innovation, Essay B suggests among others resource based view (Leonard-Barton, 1992), dynamic capabilities (Teece, 2007) and open innovation (Chesbrough, 2003). Note that this essay is the most evident expression of the pragmatic component in our research philosophy, as an unusual design is employed to answer an unusual research question.

Finally, *Essay C* attempts to explain why and to which external leverages of reverse innovation enterprises do (not) resort. In order for this question to be answered, we first conceptualise external leverages to include three dimensions: content (market knowledge; technology; equity finance), form (inter-organisational cooperation; open innovation; corporate venture capital) and purpose (product or service development; business model development; diffusion). As research strategy, a multiple case study is performed, since "why" research question are best tackled by explanatory case studies (Yin, 2014). Multiple case studies allow for cross-case comparisons, enhance internal validity of results and make them more generalizable (Lewis-Beck et al., 2004).

As embedded technique to analyse data collected, we decided for explanation building, which is narrative and iterative; it starts from an initial explanation that is repeatedly revised until it eventually matches all empirical data (Yin, 2014). Note that Saunders et al. (2009: 500) and Yin (2014: 147) see explanation building as a *deductively based* analytic technique, which may appear in contradiction to the generally inductive approach underlying the thesis. Yet inductive and

deductive approaches are not mutually exclusive; "Not only is it perfectly possible to combine deduction and induction within the same piece of research, but also [...] it is often advantageous to do so" (Saunders et al., 2009: 139). We argue that explanation building basically combines both approaches, with deduction in the initial explanation and induction in subsequent iterations. The advantage to our research project meant lower risk as compared to analytic induction, which is basically a (more) inductive version of explanation building (ibid: 508). To see this, consider first that initial explanation may contain different degrees of theory (Yin, 2014: 149). The more theoretically based the initial explanation, the more deductive is explanation building. Yet if initial explanation is less or hardly theoretical, explanation building remains *deductively based* but turns *in fact inductive* technique to iteratively build new theory from cases studied (cf. Eisenhardt, 1989b; Eisenhardt and Graebner, 2007). Essay C leveraged on this insight to reduce project risk by research design. On the one hand, extant literature on reverse innovation did not allow for definition of initial theoretical frameworks and hypotheses regarding the research question. On the other hand, however, this literature predominantly depicts large Western MNEs as actors, which in turn implies that actors are likely to be in possession of sufficient or even slack resources. Consequently, refraining from external leverages of reverse innovation might have been a simple consequence of actors' self-sufficiency, with their resource endowment as the only but sufficient explanatory variable. If we had ignored this rather simple – but nevertheless possible – initial explanation and employed analytic induction, we could have ended up looking for something where there is nothing to find. "With induction you have constantly to live with the fear that no useful data patterns and theory will emerge" (Saunders et al., 2009: 127). Research design with explanation building eliminated this risk early, but subsequently remained flexible to allow for a theoretical explanation to emerge from the patterns observed.

The existence of an initial explanation notwithstanding, we doubt whether actors' resource endowment is really the whole story, and aim at identifying possibly unobserved causal paths ("heuristic case study"; Thomas, 2011: 515), for which "outlier cases may be especially valuable". Therefore, the population of Serbian SMEs was pre-selected to draw cases from, as enterprises from middle-income economies do not necessarily possess own technological assets to pursue reverse innovation, and particularly Serbian SMEs lack capital for innovation diffusion (OECD, 2013). In this constellation, some external leverages of reverse innovation are likely needed and possibly in fact relied on, so the initial explanation may rapidly be verified or refused. Four enterprises from the population have been identified, three of which participated in our study. Note however that the embedded unit of analysis in Essay C is the particular reverse innovation (Yin, 2014: 31-34), as we were unconcerned with why the firms (not) resorted to external leverages otherwise. Data collection was performed by triangulation of semi-structured interviews, shop floor or plant visits, firm documentation and external documentation analysis.

In contradiction to initial explanation, all case firms suffered from lack of own and affordable debt finance, but nevertheless refrained from corporate venture capital as a financing alternative. As these data uncovered with initial explanation had emerged, we continued inductively and drew on further literature to develop improved explanations for the next iteration. Our final explanation indicates that case firms opportunistically resorted to external leverages of reverse innovation of any content, form and purpose, but only as long as that did not negatively affect the involved decision makers in their core self-evaluation as innovators. In other words, the enterprise's factual or perceived resource base determines which external leverages of reverse innovation may *potentially* be resorted to. However, decisions whether these leverages will be *in fact* resorted to, and if so to which extent, are made in a way that maintains the decision makers' core self-evaluation, which may or may not be the optimal decision regarding innovation performance.

In consequence, we frame an enterprise's strategic decision regarding external leverages of (reverse) innovation by upper echelon theory (Hambrick and Mason, 1984), core self-evaluation theory (Judge et al., 1997) and theories of self-concept maintenance (Carver and Scheier, 1981; Higgins, 1987; Mazar et al., 2008).

6.6. Note on Publications and Coauthors

As noted previously, the labels of essays do not imply any priority or hierarchy, but merely the maturity and chronology with regard to the publication process (Table 12). At the time of this writing, Essays A and B have already been published, while Essay C is pending submission for a potential publication. The systematic literature review contained in this general introduction shall be adapted to a potential publication at a later point of time. Note that Essay A is synonymously referred to as (Radojevic and Peerally, 2013) and Essay B as (Radojevic, 2015).

Essay	Corresponding publication and coauthors
A	"Reverse Innovation and the Bottom of the Pyramid Proposition: New Clothes for Old Garbs?". In Jin, C. and Al-Hakim, L. (Eds.), 2013. <i>Quality Innovation: Knowledge, Theory and Practices</i> , pp. 32-52. Hershey, Pennsylvania: IGI Global. Coauthored by Jahan Ara Peerally.
B	"Reverse Innovation Reconceptualised: Much Geo-Economic Ado about Primary Market Shift". <i>Management International</i> , 19(4), pp. 70-82. Special Issue "Globalization of Innovation Processes in Multinational Companies", 2015.

Table 12: Essays and corresponding publications

6.7. Ethical Considerations

As no primary data have been collected for Essays A and B, only the research project that has led to Essay C was submitted for approval, and approved, by the Ethical Committee of HEC Montréal. An ethical certificate was subsequently issued in April 2014 and extended in May 2015.

Using real names of organizations and persons facilitates understanding and increases credibility of a study. However, participating enterprises and individuals are mentioned in Essay C by their

real names only if they (in case of enterprises: their respective managing owners) have freely, formally and in writing declared their consent. As managing owners of participating enterprises have been the primary respondents, a risk of any negative consequence for the individual interviewees can be generally ruled out.

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ESSAY A: "Reverse Innovation and the Bottom of the Pyramid Proposition: New Clothes for Old Garbs?"

Abstract

Analysing cases from India, this chapter reveals flaws in recent claims that reverse innovation can resolve some of the world's most urgent social problems. Reverse innovation implies the diffusion of innovations from developing to developed countries, and is therefore, per se, irrelevant for the social needs of the former. If understood more broadly, as a strategic approach, reverse innovation may reduce some dimensions of inequality. However, as an instrument of poverty reduction, reverse innovation equals the known and compelling but doubtful proposition that developed country multinational enterprises may induce large-scale prosperity simply by doing business with the World's poorest. In this chapter, we assess the social impacts of reverse innovations and we contrast previous wholesale claims on those impacts with an in-depth analysis. Our analysis reveals that these social impacts are not as significant as currently believed. We conclude by suggesting future research avenues on the bottom of the pyramid which will be of key relevance to academics and managers alike.

Keywords: Reverse innovation; bottom of the pyramid; social impacts of innovation; innovation in emerging markets.

1. Introduction

In 2009, Immelt et al. (2009) established the concept of reverse innovation as innovations which diffuse to developed economies after being introduced to developing ones. Thus, reverse innovation is seen as the opposite of the "glocalisation" approach (Khanna and Palepu, 2006) and implies a novel direction for the diffusion of innovations which is unlike those of previous theories. More recently, the concept as introduced by Immelt et al. (2009) has been extended to purport that reverse innovation is in fact a strategic approach used by multinational enterprises (MNEs) from developed economies (Govindarajan and Trimble, 2012; Laperche and Lefebvre, 2012) which operate in emerging and developing economies. Consequently, this literature argues that, as a strategy, reverse innovation is anticipated to benefit the MNEs from developed economies threefold (Govindarajan and Trimble, 2012). First, MNEs could tap into the tremendous business opportunities which emerging markets offer due to their high growth rates and sheer population sizes. Second, MNEs would additionally benefit from innovations initially developed for emerging markets by subsequently introducing these innovations into the low-end segments or niches of developed markets. Finally, pursuing reverse innovations could help MNEs from the developed world to pre-empt the threat of rising MNEs from emerging economies.

Following from the above, it can be argued that at the very least, the concept of reversion innovation is subject to some literature-based misnomer. At the most, it is evident that the phenomenon of reverse innovation is evolving in a fragmented manner, and therefore requires a theoretical integration with previous work on innovation. Such integration is beyond the focus of this chapter, however. Instead, this chapter focuses on the claim in recent literature that reverse innovation can serve as *"an instrument for solving some of the world's most vexing social problems"* (Govindarajan and Trimble, 2012, p. 192). These claims, we argue, recycle the 'bottom of the pyramid' (BoP) proposition (for e.g. by Prahalad, 2005), except that now the latter includes the

added dimension of reverse innovation. The literature on the BoP proposition asserts that not only could MNEs achieve 10 to 200 times better business performance by serving the tiers further down the economic pyramid of emerging markets as compared to targeting the top tiers only (Prahalad, 2005), but by this virtue, the MNEs could also eradicate poverty through profits (ibid). Based on the few salient points presented above, the main motivation for this chapter becomes axiomatic. We particularly aim at adding a piece of evidence to the complex relationship between innovation, poverty and inequality, as previously summarized by Cozzens and Kaplinsky (2009). In this effort, we assess the social impacts of reverse innovation within its most documented context, namely the emerging market India.

To do so, we firstly develop a four-stage conceptual model which draws on Dunning and Lundan's (2008) classification of economic and strategic motives for foreign direct investment (FDI). The model illustrates the four stages through which developed country MNEs operating at the BoP progress before and while engaging in reverse innovation. This four-stage model is the key for analysing the cases of MNEs which are currently held as contributing to poverty reduction at the BoP through reverse innovations. Secondly, we develop an assessment framework for social impacts of reverse innovation derived and adapted from the previous work of London (2009). This assessment framework is applied to cases from India known from the academic literature, in order to demonstrate that the social impacts of MNEs, depending on their position along the four stages of our conceptual model, are not as significant as currently believed. Based on this assessment, we contradict previous wholesale claims made on the poverty reduction property of reverse innovation with an in-depth analysis. We complete the chapter by suggesting future research avenues of key relevance for both academics and managers.

This chapter is organized as follows. The next section presents the concept of reverse innovation and the BoP proposition in detail. Third section identifies India as *the* example for the analysis

following later on, since this emerging market represents the geographical intersection for the most extensive literature and documentation on both the BoP proposition and on reverse innovation. In the fourth section, we present our conceptual model which illustrates the four stages underlying the scenario of reverse innovation by MNEs targeting the BoP. These stages are market-seeking FDI, innovation in India, domestic diffusion within India, and the international diffusion to developed economies. In the fifth section, we then apply our four-stage conceptual model to the documented cases from India and position these cases along the stages of the model. The subsequent sixth section contains the analytical kernel of the chapter. In this section, we introduce the assessment framework for the social impacts of reverse innovation along identified categories such as income and social relationships (derived from London, 2009), and assess the social impacts along the four stages of our conceptual model. In consequence of this assessment, the ensuing section suggests future research directions. The final section concludes that reverse innovation has not yielded any significant social improvements for the Indian BoP, as currently purported in the literature. If understood as a strategic approach used by MNEs (*à la* Govindarajan and Trimble, 2012), reverse innovation is simply a re-conceptualisation of the BoP proposition but with the added dimension of the former. In the context of this re-conceptualisation, reverse innovation is seen as a tool for poverty reduction. Yet our analysis finds no evidence to support the claims that reverse innovation would either result, at the most, in large-scale prosperity or, at the least, in poverty reduction.

2. Background

2.1. Reverse Innovation: A Fragmented Concept

In the innovation literature, it is often implicitly assumed that innovative processes have a 'normal' direction and that under certain circumstances this direction can deviate or invert (Burger-Helmchen et al., 2013). An example of such change in direction is seen in Schmookler (1966), who introduced the market demand-pull model of innovation as the inversion of the then-dominant technology availability-push innovation model.

The concept of reverse innovation can be considered another manifestation of this change in 'normal' innovation direction. In fact, the term 'reverse innovation' made its first appearance in an article by Foxall (1989, p. 95), in which reverse innovation is described as "*new product marketing by users*", which resembles von Hippel's (1986) concept of lead users as a source of innovation. However, more recently, reverse innovation has been re-conceptualised by Immelt et al. (2009). In this understanding on which we draw in our chapter, reverse innovations are innovations diffusing from developing to developed economies, which is indeed the opposite direction of international innovation diffusion as explained, for example, in the International Product Life Cycle Theory put forward by Vernon (1966, 1979). Although the latter theory does not explicitly exclude developing countries as potential locus of innovation, it is nevertheless mute on innovations diffusing from developing origin to developed destination. Reverse innovations as understood by Immelt et al. (2009) was initially exemplified and documented through cases of product innovations by General Electrics which were initially introduced to the Chinese and Indian markets, and which eventually diffused back to developed economies including General Electrics' home country, namely the United States (ibid).

This conceptualisation of reverse innovation has been, thereafter, echoed in several scholarly articles, including e.g. Govindarajan and Ramamurti (2011) and Burger-Helmchen et al. (2013).

Comparably to innovation terminologies in general, however, a set of terms referring to innovations originating from developing countries is emerging, with similar, partly overlapping or indistinguishable meanings. As pointed out in Burger-Helmchen et al. (2013), papers by Hang et al. (2010), Talaga (2010), and Corsi and Di Minin (2011) understand reverse innovation in a slightly different way, for example as necessarily disruptive innovations diffusing from emerging markets (ibid).

More importantly within the context of our chapter, some recent sources (for e.g. Govindarajan and Trimble; 2012; Laperche and Lefebvre, 2012) add a strategic interpretation to the concept of reverse innovation. According to these sources, reverse innovation is still a path of innovation diffusion as introduced by Immelt et al. (2009), but it is concomitantly a strategic approach to be pursued by MNEs from the developed world. While developed economies are becoming saturated (London and Hart, 2004; Osenton, 2004), developing countries *"are likely to account for at least two-thirds of world GDP growth for decades to come"* (Govindarajan and Trimble, 2012, p. 8). Thus, in order to tap into this potential, Govindarajan and Trimble contend that MNEs from developed economies need to consider local realities and innovate specifically for emerging markets. However, as a study by Deloitte (2006) based on survey of executive managers of 418 MNEs from developed economies (a half of which with over \$1 billion in annual revenues) reveals, these MNEs still target emerging markets with the offerings identical or similar ("glocalized") to the offerings in developed markets, notwithstanding the fact that the surveyed managers acknowledge that products specifically developed for emerging markets yield significantly higher margins. Tiwari and Herstatt (2012) name innovations required for emerging markets 'frugal innovations': they are developed specifically for emerging markets, particularly India, and are affordable, robust, and *"good enough"* (ibid, p. 2) without excessively compromising on quality. As purported by Govindarajan and Trimble (2012), such innovations offer 50% performance at 15%

of the price to emerging market consumers when compared to developed market products and consumers.

Additionally, it is argued that the growth opportunities for developed country MNEs would significantly increase by introducing innovations initially developed for emerging markets to formerly untapped market segments of developed economies, particularly to over-served low-end segments (Christensen, 1997; Christensen and Raynor, 2003). Finally, MNEs from the developed world should pursue such a strategy for defensive reasons as well, in order to curb or pre-empt potential competitive threat from 'emerging giants' (Khanna and Palepu, 2006), in other words, MNEs from emerging economies.

From the above discussion, it is evident that reverse innovation as a strategy used by MNEs encompasses two stages. Firstly, the MNE innovates (frugally or otherwise) specifically for, and diffuses these innovations within emerging markets. Secondly, the MNE diffuses these innovations from emerging to developed markets, simultaneously or after the innovation is launched into the emerging market.

Moreover, the above discussion also highlights the fact that the concept of reverse innovation is evolving in a fragmented manner with various facets and therefore requires a theoretical integration with previous work on innovation. As mentioned previously, such integration is beyond the scope of this chapter. Rather, this chapter focuses on the most recent claims about reverse innovation as brought to our attention by Govindarajan and Trimble (2012, p. 192), namely on the *"power of reverse innovation as an instrument for solving some of the world's most vexing social problems"*. Since there are hardly any social problems of affluent classes in developing countries to solve, these claims refer to social problems that plague the individuals at the bottom of the economic pyramid. In other words, Govindarajan and Trimble (2012) draw on the bottom of the

pyramid (BoP) proposition in a context altered by the presence of reverse innovation. Hence, the following section revisits the BoP proposition.

2.2. The Bottom of the Pyramid (BoP) Proposition

The socioeconomic structure of emerging markets, as depicted in Figure 7, is considered to be four-tiered (Prahalad and Lieberthal 1998; Khanna and Palepu, 2006).



Figure 7: The four-tiered structure of emerging markets

Source: adapted from Khanna and Palepu, 2006

Seeing that MNEs from developed countries largely target the global tier of emerging markets, followed by the "glocal" tier, the BoP proposition, as intended by Prahalad and Hart (2002), argue that foreign MNEs are disregarding tremendous opportunities further down the market pyramid. Despite the fact that the definitions of the BoP considerably vary, as do the estimates of its population and market size, even the most conservative assumptions, as shown in Table 13, yield a total population of few billion individuals and an annual purchasing power exceeding \$1 trillion at purchasing power parity (PPP).

Property	From...	...To
Poverty line, USD per day/capita at purchasing power parity	\$1	\$2
Number of individuals	2.7 billion	4.0 billion
Combined purchasing power, USD at purchasing power parity	\$1.2 trillion	\$13 trillion

Table 13: The worldwide BoP estimation ranges⁴

Sources: Based on own compilation of data extracted from the World Bank Indicators (www.worldbank.org) and the Population Reference Bureau (www.prb.org).

Thus, according to Prahalad and Hart (2002) and Prahalad (2005), foreign MNEs should tap into this vast bottom market tier and as a result "do well by doing good" (ibid, p. 26). Karnani (2007, p. 90) presents his bulleted interpretation of Prahalad and Hart (2002) and Prahalad's (2005) stances of the BoP proposition, which he does not adhere to, as follows:

- *"There is much untapped purchasing power at the bottom of the pyramid. Private companies [i.e. Western MNEs] can make significant profits by selling to the poor.*
- *By selling to the poor, private companies can bring prosperity to the poor, and thus can help eradicate poverty.*
- *Large multinational companies (MNCs) should play the leading role in this process".*

Several practitioner-orientated articles categorically support Prahalad and Hart (2002) and Prahalad (2005) stances (see for e.g. Hart and Christensen, 2002; Prahalad and Hammond, 2002; Anderson and Markides, 2007; London, 2009). In addition, some academically-oriented articles are also generally positive about the BoP proposition (e.g. London and Hart, 2004), although less enthusiastic (Rajan, 2007; Viswanathan and Rosa, 2007). However, the BoP proposition is not unchallenged. Critical voices, predominantly those from the developmental perspective, have

⁴ The Bottom of the Pyramid is conceptualized differently by different authors. For example, some sources use estimates of people living on less than \$1 a day and others on less than \$2 a day. Our compilation regroups all the different conceptualizations as presented in Prahalad and Hart (2002), Prahalad (2005), Karnani (2007), WB (2009) and INSEAD (2011).

been articulated in the academic literature (see for e.g. Jenkins, 2005; Walsh et al., 2005; Landrum, 2007; Karnani, 2007). Furthermore, empirical evidence on the BoP proposition provides ambiguous results, and is restricted to few studies (Prasad and Ganvir, 2005; Rost and Ydren, 2005; Rajan, 2007; Xavier et al., 2007).

Regardless of the ongoing debate about the actual magnitude of the social impacts of the BoP proposition, virtually all sources consensually emphasize the importance of innovations specifically targeting developing countries (e.g. Hart and Christensen, 2002; Prahalad and Hart, 2002; Prahalad, 2005; Anderson and Markides, 2007; Karnani, 2007; Rajan, 2007). The BoP proposition challenges foreign MNEs *"to increase innovation and creativity, with a special emphasis on strategies for entering emerging economies"* (Landrum, 2007, p. 9). Recent claims that reverse innovation can help resolve some of the world's grave social needs (Govindarajan and Trimble, 2012) clearly follow up on this consensus.

3. Reverse Innovation and the BoP in India

According to data from the Economist Intelligence Unit (EIU), India has enjoyed high growth rates of gross domestic product (GDP) since 1997, with a compound annual growth rate of ca. 7%⁵. At purchasing power parity (PPP), India's GDP has surpassed the GDP of Germany in 2006 and that of Japan in 2011, while India's GDP growth rates are expected to remain at a level fairly above that of developed countries⁵. Despite these positive economic trends, India remains a poor country. According to World Bank data⁶, India's real GDP per capita was \$1,477 in 2010 (137th in the world), while the poverty ratio was at 29.8%. Multiplied with India's total population of 1.24 billion, this ratio implies that the Indian bottom of the pyramid accounts for 370 million

⁵ Authors' own calculation based on data from the Economist Intelligence Unit (EIU) website (www.eiu.com), retrieved in March 2013.

⁶ Data retrieved from the World Bank website (www.worldbank.org) in March 2013.

people. Even the most conservative estimates, as seen in Table 13, imply that the BoP in India accounts for an annual purchasing power of almost \$200 billion at PPP.

Although millions of India's poorest live in slums such as the Mumbai's Dharavi, the actual Indian BoP market is dispersed rather than concentrated, since 71% of the Indian population lives in rural areas, spread over more than 600,000 villages (INSEAD, 2011). Furthermore, the Indian BoP *"faces scarcity on a grand scale across the board: from water and food to oil and gas and to primary education and basic health care"*; consequently, *"the need to get more value for less cost [...] is often a matter of survival"* (INSEAD, 2011, p. 77).

Combining the above data on purchasing power with the reality of poverty in India consequently and potentially renders this emerging market the ideal place for developed country MNEs to reap added business benefits and provide social benefits. Summarising results of a case study from India (Prasad and Ganvir, 2005), which provides positive evidence for social benefits, and of another study from Mexico and Indonesia (Rost and Ydren, 2006) showing at best neutral social impacts, Landrum (2007) assumes that India might even be the only country where the BoP proposition yields positive results for both the society and MNEs. Following from this premise, and considering the fact that the extant literature on reverse innovation largely focuses on India (e.g. Brown and Hagel III, 2005; Immelt et al., 2009; Hang et al., 2010; Talaga, 2010; Govindarajan and Ramamurti, 2011; Govindarajan and Trimble, 2012), we chose India as the setting for analysing the social impacts of reverse innovation on the BoP. However, before conducting this analysis, in the following section we first present in detail the scenario under which Govindarajan and Trimble's (2012) claim that reverse innovation may solve India's social problems.

4. Four-Stages Model of Reverse Innovation from the BoP

Explicitly and implicitly, Govindarajan and Trimble (2012) propose that reverse innovation would solve the social problems of India's poorest under the following scenario.

1. A MNE *from a developed country* aims at reverse innovation from India.
2. As a necessary prerequisite for reverse innovation *from* India, this MNE needs first to innovate *in and for* India, i.e. needs to introduce frugal innovations (Tiwari and Herstatt, 2010) into the Indian market.
3. These frugal innovations target the bottom tier of Indian market, i.e. the MNE operates at the BoP and diffuses frugal innovation within India, prior to diffusing the innovation back to developed markets.

Following from the above scenario, we infer that given that the MNE *itself* innovates for and operates in India, and does not export or licence its offerings via a local partner, it must have had to initially engage in FDI and open a local subsidiary. Under this scenario, the MNE's economic and strategic motive for engaging in FDI is clearly and primarily market-seeking (Dunning and Lundan, 2008) and not primarily natural resource seeking or efficiency-seeking for example⁷.

Thus, combining Dunning and Lundan's (2008) classification of motives for FDI with the various fragments of the reverse innovation concept, we develop a four-stage conceptual model which illustrates the stages through which a developed country MNE that operates at the BoP progresses before and while engaging in reverse innovation. These stages, illustrated in Figure 8, include FDI, innovation, domestic diffusion, and international diffusion.

⁷ In some cases MNEs may have already exhausted a market-seeking strategy and their economic and strategic motive may evolve into an efficiency-seeking one.

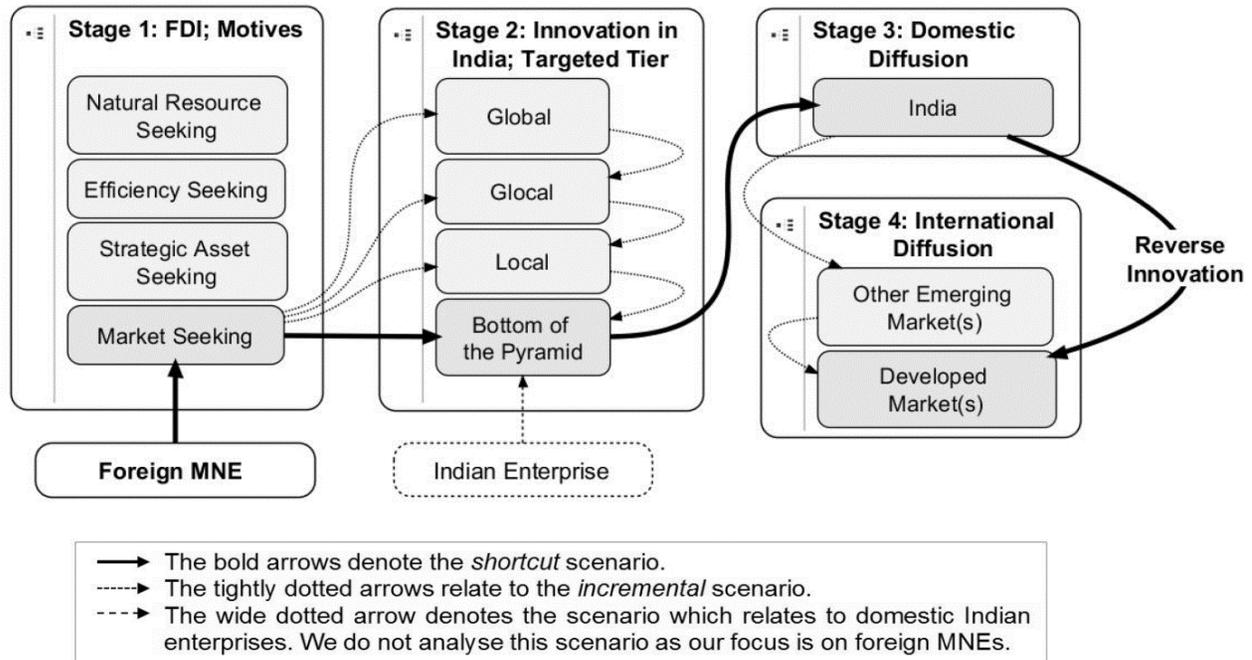


Figure 8: Four stages leading to reverse innovation

There are several variations of the MNE's progression from one stage to the next in this model. The *shortcut* scenario, as represented by bold arrows, is the most direct route through the four stages for the MNE to progress from market entry via FDI to the Indian BoP and to reverse innovation. The *incremental* scenario leads equally to reverse innovation, but the MNE may take, for example, a prior detour via other market tiers during stage 2 of the model, rather than the direct path via the BoP. These detours actually reflect both the reality of developed country MNEs in India and the theoretical model of MNEs' incremental commitment to foreign markets as established by Johanson and Valne (1977). There could also be a *complete* scenario whereby the MNE progresses to stage 4 of the model, through any of the combinations mentioned above, and an *incomplete* scenario whereby an MNE does not progress beyond stage 3 of the model. Finally, a *related* scenario involves some shared nodes and/or paths with the shortcut scenario, but the process does not necessarily start with the foreign MNE (in which case it starts with an Indian enter-

prise), it may not necessarily involve the BoP tier in stage 2 of the model, and/or it may or may not result in reverse innovation in stage 4.

Thus, as a strategic option for MNEs from developed countries, reverse innovation includes all stages of the model and therefore includes the BoP proposition (stages 1-3) and the international diffusion of innovations to developed countries (stage 4).

5. Applying the Four Stages Model to the Indian BoP Cases

While there are several documented cases of Indian enterprises innovating for and operating at the BoP, such as Bharti Airtel (Prahalad and Mashelkar, 2011), ITC Ltd (London, 2009), n-Logue (Jhunjhunwala et al., 2004), SKS Microfinance (Akula, 2008), and Tata Chemicals (Prasad and Ganvir, 2005), there are very few documented cases of developed country MNEs doing the same. Many developed country MNEs engage in market-seeking FDI in India (UNCTAD, 2011), yet the majority diffuses solely offerings identical or similar to those in developed markets (see above; Deloitte, 2006), therefore not innovating specifically for India and consequently operating solely in stage 1 of our conceptual model (Figure 8). The number of developed country MNEs in stages 2 to 4 of the model remains very limited. Applying our four-stage model to these rare cases of MNEs specifically targeting the Indian BoP yields results summarized in Table 14. General Electrics does not operate at the BoP at all, although its handheld electrocardiogram device does help to provide medical services to rural areas. Novartis' Arogya Parivar program, although reportedly scalable, on the other hand covers only some 30,000 (or 5%; INSEAD, 2011) of 600,000 Indian villages and can be considered a large-scale experiment (Jhunjhunwala et al., 2004). When it comes to MNEs pursuing large scale operations at the Indian BoP, documented cases thus boil down to virtually one unique case, namely Hindustan Unilever Ltd (HUL). Anderson and Markides (2007) report that HUL's products penetrate rural India with rates between 32% and

90%. However, there are no documented cases of reverse innovation resulting therefrom. The crux of the HUL case is that small packages of toiletries such as shampoos, shaving foam and toothpaste were created for and marketed at the Indian BoP. In parallel, it is also a fact that these small packages exist in developed country markets. These small packages for the Indian BoP may be argued as being reverse innovation, however the fact remains that there is an absence of empirical evidence to validly prove this claim.

Enterprise	Source(s)	Short Description	Applying the Four Stages Model
General Electrics (GE)	Immelt et al. (2009); Govindarajan and Trimble (2012)	Handheld electrocardiogram device; innovated for rural India. The device itself does not target bottom tier consumers, but enables these consumers to receive medical services.	<i>Related</i> scenario: Foreign MNE enables medical services for rural areas; reverse innovation is in progress.
Novartis	INSEAD (2011)	Arogya Parivar program; delivering health services in rural areas via "health educators" who act as micro-entrepreneurs earning from sales of medications; collaboration with public authorities and NGOs.	<i>Incremental</i> scenario: Foreign MNE operating at the BoP; viewed as experimental in nature, reverse innovation is not anticipated.
Hindustan Unilever Ltd. (HUL)	Prahalad and Hart (2002); Prahalad (2005); Karnani (2007); Rajan (2007); Xavier et al. (2007)	Several profitable and coordinated programs targeting the bottom of the pyramid; distribution, product, and brand innovation; innovation in communication and packaging, e.g. packaging for fewer usage occasions, eventually single-serve sachets; encourages rural micro-entrepreneurs.	<i>Incremental</i> scenario: Foreign MNE (Indian subsidiary of British-Dutch Unilever) operates at the bottom market tier; no documented evidence of achieved reverse innovation so far.

Table 14: Documented cases of developed country MNEs at the Indian BoP

In sum, when applying our conceptual model, it becomes evident that there are, firstly, abundant cases of foreign FDI projects in India, many of which are market-seeking in nature (stage 1). Secondly, there are very few cases of foreign MNEs innovating for, and commercially operating at the bottom of the market in India (stages 2 and 3). Thirdly and lastly, there are presently no documented cases of reverse innovation resulting from innovations for the Indian BoP (stage 4). In fact, Govindarajan and Trimble's (2012) work is based on reverse innovation focusing on

emerging middle class rather than the BoP. As such the existing literature does not provide any empirical guidance on how to assess the social impacts of reverse innovations derived from the BoP. Consequently, in the next section we rely on an existing BoP framework (London, 2009) for assessing social impacts, but we apply it to the concept of reverse innovation by analysing these impacts from the perspective of our conceptual model shown in Figure 8 of this chapter.

6. Social Impacts of Reverse Innovation

As discussed previously in this chapter, the basic assertion of the BoP proposition with regards to social impacts is that foreign MNEs which sell to this market tier will bring prosperity and help eradicate, or at least alleviate, poverty. However, taking a purely market transaction perspective (i.e. foreign MNEs selling to the BoP), this assertion fails to concomitantly consider both positive and negative externalities. In order to capture a holistic picture of positive and negative impacts, London (2009) presents a "Base of the Pyramid Impact Assessment Framework". This framework is a matrix which distinguishes between impacts on economics, capabilities, and relationships along one dimension, and between constituents i.e. buyers, sellers, and communities along another. In a similar fashion, Cozzens and Kaplinsky (2009) developed a matrix that links innovation with poverty and several dimensions of inequality. For our analysis, we adapt London's (2009) framework as shown in Figure 9, since a hierarchical approach rather than a matrix is better suited to our purpose. As previously mentioned, London (2009) distinguishes between constituents such as consumers, micro-entrepreneurs and competitors in his matrix, but in our analysis of social impacts we regroup these different constituents. Our preference for a hierarchy results from the fact that a discussion of social impacts is more purposeful if pursued from an overall societal perspective, rather than for each constituent separately. Thus, in the following Figure 9, social impacts are structured in three categories namely income, social infrastructure, and so-

cial relationships. These three categories then lead to seven impact categories, namely from 'consumers' to 'caste and intercommunity relationships'. Income, derived from 'economics' in London's (2009) framework relates to the income of consumers, middleman micro-entrepreneurs and other existing market players. Social infrastructure is derived from our analysis in Table 14, whereby we have added the impact categories of 'education on health and sanitation' and 'training' to London's (2009) framework. Finally, social relationships also derived from London (2009) include the impact categories of 'gender and intra-family relationships' and 'caste and intercommunity relationships'. We then proceed to analyse social impacts of reverse innovations along the four stages identified in our conceptual model (Figure 8) and across those seven impact categories.

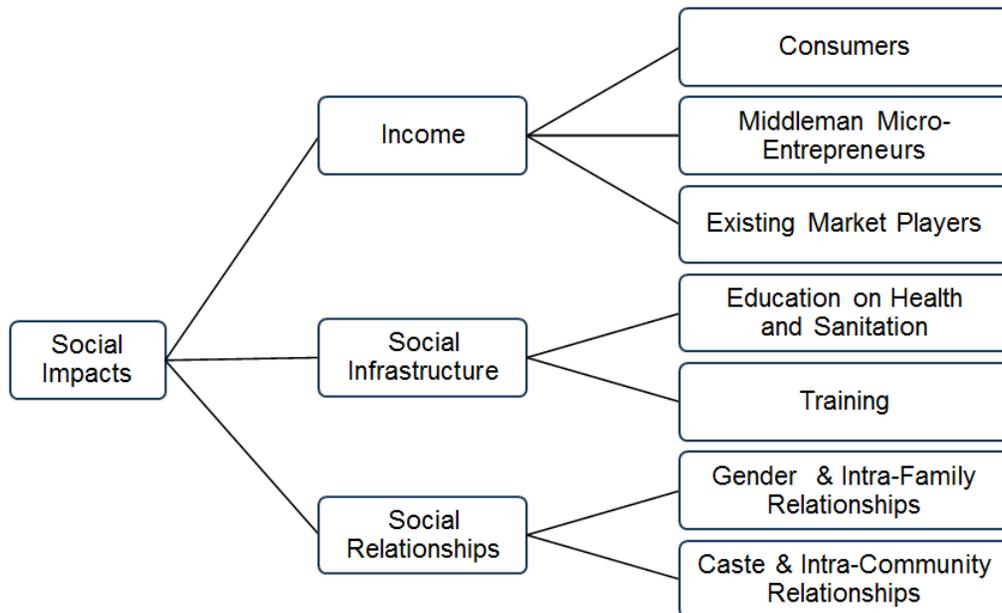


Figure 9: A framework for assessing the social impacts of foreign MNEs operating at the Indian BoP

Source: Adapted from London (2009)

6.1. Stages 1 and 2: Market-Seeking FDI and Innovation for India

At least at the aggregate level, FDI has *some* impacts on the recipient developing countries, for example by affecting local labour market and competition, flow of technology and knowledge, overall economy, environment, etc. (for a complete framework organising FDI impacts, see e.g. Meyer, 2004). This is the only general consensus in different streams of FDI literature. Yet when it comes to the question whether the FDI impacts on developing countries are *positive or negative*, different approaches make fundamentally opposing predictions. The Marxist and dependency theory view the aggregate impacts of FDI as unambiguously negative, while the neo-classical approach views these impacts as positive. In this chapter, we take the national technological capabilities/national innovation systems theory approach, which unlike the two aforementioned approaches conditionally affirms the positive impacts of FDI (e.g. Lall, 1992; Blomström and Kokko 1998; Lall and Narula, 2004). This strand of literature sees the national institutional and technological environment as determinants of development, with innovative processes among a country's enterprises being the channel (e.g. Lundvall, 1992; Nelson, 1993; Freeman, 1995; OECD, 1997; Lundvall et al., 2009). In this context, *"if FDI results in technology transfer, and if domestic firms internalise the spillovers, and if domestic conditions support learning, there will be economic development"* (Narula, 2011). Simply put, the implicit and basic proposition of this approach is that there is a 'right' and 'wrong' kind of FDI for economic development (Narula and Dunning, 1999). In line with this proposition, the literature implies that market-seeking FDI – which is as per our model in Figure 8 necessary for reverse innovation – is not usually considered the right kind of FDI for economic development, as shown by regional studies on East Asia (Ozawa, 2003) and Latin America (Mortimore, 2000). The lower local market segments in developing countries are usually served by domestic enterprises; an entrant MNE from a developed country with superior resources will cause detrimental crowding-out of domestic enterprises in

the same market segments, rather than positive spillovers leading to development (Spencer, 2008). Furthermore, even if FDI leads to development and growth, growth does not necessarily reduce inequality in income distribution i.e. poverty (Fields, 2001). With regard to the direct impact of market-seeking FDI on the Indian BoP specifically, empirical studies are yet to come. Nevertheless, we conclude that in stages 1 and 2 of our conceptual model, social impacts of reverse innovations are ambiguous to assess across all seven impact categories.

6.2. Stage 3: Domestic Diffusion of Frugal Innovations within India

Consumers' income: Simply selling to the consumers at the BoP will not change their income and therefore their poverty level. Several sources make this very straightforward conclusion (see for e.g. Jenkins, 2005; Karnani, 2007; Landrum, 2007). If they really want to increase the income at the bottom of the market, foreign MNEs should rather view *"the poor as producers"* and be buying from instead of selling to them (Karnani, 2007, p. 91). In addition, a *"poor person is far more constrained by lack of income than by lack of variety of goods and services"* (ibid, p. 97). Thus, selling goods such as shampoos or cell phones may therefore entice the poor into diverting their minuscule incomes from *"higher priority needs such as nutrition and education and health"* (ibid, p. 97). However, some supporters of the BoP proposition (e.g. Prahalad and Hammond, 2002) suggest that consumers at the BoP recognise that it is not a realistic option to rely on businesses to fulfil their basic needs, such as access to running water or electricity. Consumption of fast moving consumer goods and luxury brands would at least *"improve the quality of their lives"* (ibid, p. 50) or, put more broadly (Landrum, 2007, p. 1), lead to cognitive gains such as *"increased engagement in the global economy, increased dignity and self-esteem"*. This may or may not be the case, and may or may not imply the reduction in, for example, the inequality of opportunities to consume. But the fact remains that that it does not increase consumers' income.

Income of middleman micro-entrepreneurs: In order to overcome adverse infrastructural conditions and to reach remote consumers, some foreign enterprises such as HUL and Novartis employ micro-entrepreneurial local distributors and support them with affordable micro-credits and training. Extant literature provides only positive examples of such cases with evidence of significant raises in income (Rajan, 2007; Xavier et al., 2007; INSEAD, 2011). Those same sources are, however, mute on unlikely potential of opportunity costs in those cases.

Income of existing market players: When they penetrate shantytowns or remote villages, foreign MNEs are not entering an economic vacuum. Economic activities with different players already existed prior to this entry, even though these activities may be predominantly informal in nature (London and Hart, 2004). A MNE entrant changes the rules of the game, by for example shifting the emphasis from informal to formal economy and by affecting the established competitive equilibrium in the market. While some domestic players, such as middleman micro-entrepreneurs may gain from this entry, others such as owners of existing businesses and local traders (London, 2009) will lose their income or a portion of it.

Education on health and sanitation: Some foreign MNEs have been reported as providing health and sanitation education. Novartis, for example, provides education on medicine and health in general (INSEAD, 2011) while HUL promotes washing hands with soap instead with water alone (Rajan, 2007). These cases of strategic philanthropy clearly benefit society while improving the competitive position of foreign MNEs (Porter and Kramer, 2006). Thus, in this particular instance the positive social impact is clearly identifiable.

Training: Once more, Novartis (INSEAD, 2011) and HUL (Rajan, 2007; Xavier et al., 2007) are cases of foreign MNEs that reportedly provide training (medical knowledge, basic computer and managerial skills) to their last mile distributors. Training is undoubtedly advantageous to these middleman micro-entrepreneurs and is considered as having positive social impacts. However,

the overall social impact of training should be discounted by potentially negative indirect effects on other local market players who do not receive training and, thus, lack the capabilities to compete under this new dynamic.

Social Relationships: Foreign MNEs (for e.g. HUL in Xavier et al., 2007) and Indian enterprises (for e.g. SKS Microfinance in Akula, 2008) alike exclusively choose women as borrowers for micro-loans, regardless of whether for micro-entrepreneurial or farming activities. It must be noted that women are selected less for altruistic reasons and more for the fact that they are simply less likely to fail than men. As a consequence of this selection, the impact on the social position of women and gender equity are reported as being positive. However, such relative changes in gender positions may increase conflicts within families (London, 2009). Another possible source of conflict is a change of relative position within community, particularly those among castes. Last but not least, with their operations at the BoP, developed country MNEs 'export' their idea of society to India (Landrum, 2007). The motive is unlikely malicious and most likely unintentional, yet Indians may not necessarily wish to adopt foreign ideas of a society.

6.3. Stage 4: International Diffusion to Developed Countries

The international diffusion of innovations initially conceived for the Indian BoP may be beneficial for the business performance of developed country MNEs (e.g. Immelt et al., 2009). However, the social impacts of these innovations on the BoP at stage 4 of our model, based on our analysis of existing cases, are non-existent. Neither income nor social infrastructure or relationships at the bottom of the pyramid can be affected by the mere fact that an MNE diffuses its (initially) Indian innovations to developed countries. For example, social impacts to India from GE's electrocardiograms innovated there (ibid) must have materialised before diffusion to the US, i.e. in some or all of Stages 1-3.

6.4. Social Impacts from Reverse Innovations: A Summary

We summarise all above mentioned social impacts into the Table 15. As can be seen, the social impacts in stages 1-2 are ambiguous since at this stage of our model, reverse innovation has not yet occurred (stage 1) or is too early in the process (stage 2) to assess. Most of the measurable impacts are at stage 3 of our model, while there are no identifiable impacts at stage 4.

Impact Category	Stages 1-2	Stage 3	Stage 4
Consumers	±	<ul style="list-style-type: none"> ○ Consumers' incomes are not increased through mere buying of goods or services – Potential of diverting income from priority needs of consumers 	none
Middleman micro-entrepreneurs	±	+ Increased income	none
Existing market players	±	– Some traders and business owners will likely lose a share of income	none
Education on health and sanitation	±	+ Increased hygiene e.g. hands washing with soap Win-win strategic philanthropy	none
Training	±	<ul style="list-style-type: none"> + Increased skills for middlemen micro-entrepreneurs – Diminished capabilities for competing market players 	none
Gender and intra-family relationships	±	+ Improved gender equity & social position of female micro-entrepreneurs	none
Caste and intra-community relationships		<ul style="list-style-type: none"> – Potential social conflicts by change of relative social positions (genders, castes) ± Export of "Western" values and ideas 	

±: Social impact is ambiguous in the sense that it is difficult to assess.

+: Social impact is assessed as being positive.

–: Social impact is assessed as being negative.

○: There is no social impact.

Table 15: Summary of social impacts of reverse innovation on the Indian BoP

7. Future Research Directions

Following from our analysis, we suggest pursuing future research avenues which firstly elaborate on and increase our understanding as to why there are only a few developed country MNEs targeting the world's BoP in general and the Indian BoP in particular. More generally, future research needs to focus on understanding the interplay between factors such as location, organization, and capabilities of developed country MNEs in emerging markets (Vives et al., 2010).

Secondly, qualitative studies are required to research developed country MNEs which focus on the BoP as a source of efficiency, not only as an untapped market tier. As Karnani (2007, p. 102) notes, if they really want to increase the income at the bottom of the market, foreign MNEs should *"emphasize buying from the poor rather than selling to the poor"*. From a research perspective, such case studies are crucial for much needed and appropriate theory building in this field. From a managerial perspective, these case studies should be useful in terms of their practical implications.

Thirdly, in terms of future research areas, there is a need for the creation of better frameworks for estimating the aggregate impacts of developed country MNEs operating at the BoP. The concept of the triple bottom line (Elkington, 1994; Elkington, 2004) has not yet resulted in an universal method or metric for calculating social impacts, despite some existing index-based approaches (Slaper and Hall, 2011). Consequently, quantifying the social grand total impact - *per se* - of foreign MNEs operating at the Indian BoP is presently not feasible.

8. Conclusions

Our study shows that reverse innovation in its narrower sense (as an innovation that diffuses from emerging to developed economies, stage 4) yields no social improvements for developing countries. In its broader sense as a strategic approach used by MNEs from developed economies, reverse innovation is simply a re-conceptualisation of the BoP proposition (stages 1-3 of our model) but with the added dimension of the subsequent international diffusion (stage 4). Yet our analysis finds no evidence to support the claim that selling to the bottom market tier results in large-scale prosperity and poverty reduction. Admittedly, some social impacts from foreign MNEs' targeting the Indian BoP (stage 3) are doubtlessly positive, notably the reduction of horizontal inequality among social groups such as genders. In addition, reverse innovation may reduce the unequal distribution of education, access to healthcare, or provide individuals at the BoP with an opportunity to participate in consumption. However, it is also factual that some impacts are ambiguous in nature, hence difficult to assess, or potentially negative, especially when the externalities of market-seeking FDI are considered (stages 1 and 2). In line with Cozzens and Kaplinsky (2009), we therefore conclude that inequality in income and/or poverty determines reverse innovation, and not vice versa. Indeed, even Govindarajan and Trimble (2012) implicitly admit this fact when they suggest that developed country MNEs should consider income gaps and innovate specifically for developing countries. However, our analysis does not support their claim that reverse innovation could in turn reduce the income gap from which it has resulted.

Unanimous enthusiasm of practitioner-orientated sources for the BoP proposition is likely attributable to the profit-driven perspective of MNEs from developed countries. The BoP proposition simply suggests that there is a lot of profit to be made; there is allegedly even more potential for profit if reverse innovation is added to the mix. Yet, if the BoP proposition serves positive social impacts as a heart-warming side dish to profits, with reverse innovation being a dessert,

promising that more potential profit means more philanthropy to the BoP, then one may easily become enticed into believing that the only one bottom line – profit – is enough to help solve some of the world's most vexing social problems.

Given its novelty, the phenomenon of reverse innovation doubtlessly deserves further research and integration with extant literature on locus, characteristics, impacts and diffusion of innovation, as well as on internationalisation strategies of MNEs from developed economies. In this context, our chapter's contributions are threefold. First, we add a piece of evidence clarifying one aspect of the complex relationship between innovation, poverty and inequality. Second, scholars' attention is directed towards fertile areas of research, rather than towards focusing on the claims that reverse innovation from the BoP results in large-scale positive social impacts. Third, and tying in with the crux of our analysis, we caution responsible managers of developed country MNEs that pursuing reverse innovation should by no means be viewed as synonymous with corporate social responsibility in emerging markets.

Appendix: Key Terms and Definitions

Bottom of the Pyramid (BoP): The largest yet poorest socio-economic group, particularly in developing countries.

Bottom of the Pyramid (BoP) proposition: The proposition that there is much untapped purchasing power at the bottom of the socio-economic pyramid of large developing countries, presenting a win-win opportunity in which foreign multinational enterprises (MNEs) play a central role. By doing business with the poorest consumers, MNEs could achieve significant profits, yet at the same time bring prosperity to the poor and help eradicate poverty.

Country, economy, market: These terms are used interchangeably for the sake of simplicity, and refer to geopolitical units, usually self-governed ones. *Note:* strictly seen, the terms are rather hierarchical: a country includes an economy, and an economy includes a market, but not vice versa.

Developed, developing (countries, economies, markets): These terms use general reference points such as gross domestic product (i.e. income) per capita to refer to different levels of development – particularly economic development – among geopolitical units. In this paper, *high-income* countries which are members to the Organisation for Economic Co-operation and Development (OECD) are considered as developed, and all other countries as developing. Emerging markets/economies form a sub-group of developing countries. *Note:* Out of 34 current OECD member countries, few with *middle income* are seen as "emerging markets" (e.g. Mexico and Turkey).

Emerging economy/market: Partly in line with Forbes (www.forbes.com), emerging economies/markets are understood as those not yet developed geopolitical units which enjoy rates of economic growth higher than the OECD average and which are transitioning into a free market economy with increasing economic freedom and integration within the global marketplace. *Note:* The term "emerging country" has been occasionally used in the extant literature but not in this

paper. Strictly seen, only the geopolitical units aiming at (but not yet having achieved) full international recognition for their political independency should be considered as emerging countries, for example Kosovo or South Sudan a few years ago, or presently Scotland which faces a referendum on independence from the United Kingdom to be held in 2014.

Multinational Enterprises (MNEs): Firms that establish foreign subsidiaries by engaging in foreign direct investment (FDI).

Reverse Innovation: In the narrower sense, a diffusion path referring to innovations diffusing from developing to developed economies. In the broader sense, a recent strategic approach for MNEs from developed countries which purports that MNEs innovate specifically for emerging markets (particularly India and China) and additionally introduce resulting innovations back to developed markets.

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ESSAY B: "Reverse Innovation Reconceptualised: Much Geo-Economic Ado about Primary Market Shift"

Abstract

Present concept of reverse innovation urges multinational enterprises from developed countries to innovate for emerging markets, and to subsequently diffuse the outcome back to their home countries. The concept hence appears exclusively reserved for enterprises of particular size or origin, and for specific host countries or levels of development. This paper repositions the concept relatively to any enterprise's dominant innovation logic, rather than relatively to its geo-economic environment. Reverse innovation thus becomes a template that any enterprise innovating for a new primary market abroad may customise to its specific situation regarding exogenous distances, endogenous distances, and managerial response.

Keywords: Dominant innovation logic; emerging markets; reversal of innovation.

1. Introduction: Reverse Innovation - A Vague Top Management Concept

Global consumption power has been shifting towards populous, less developed countries enjoying high rates of economic growth (Kose and Prasad, 2010; OECD, 2010; PWC, 2013). Present concept of reverse innovation hence urges multinational enterprises from developed countries (MNEs) to innovate specifically for emerging markets and to subsequently diffuse the outcome back “home”, to developed markets. By doing so, MNEs would tap into opportunities further down the socio-economic pyramid in emerging markets and improve their competitive position in traditional ones.

In essence, reverse innovation connects innovation management and strategy in the context of the globally shifting consumption power. On the one hand, it addresses innovation in resource-poor environments i.e. in environments where affluent customers are scarce. By embracing this dimension of scarcity, an MNE may tap into opportunities where competitors mainly see obstacles (Cunha et al, 2014). On the other hand, the concept pushes the balance within the global strategic mix (Bartlett and Ghoshal, 1989) towards local responsiveness, i.e. towards the strategic option of adaptation in a given host country (Ghemawat, 2007). Reverse innovation has been widely recognised for these contributions; for instance, a group of Harvard Business Review editors has ranked it among top management concepts of the decade (Kirby, 2010).

All recognition notwithstanding, the present concept is characterised by mutually reinforcing instability and detachment. On the one hand, it has been undergoing a certain evolution, from a mere diffusion path from less to more developed countries (Immelt et al, 2009; Govindarajan and Ramamurti, 2011) to a strategic approach reserved for Western MNEs (Govindarajan and Trimble, 2012; Laperche and Lefebvre, 2012). On the other hand, the concept lacks academic maturity as it relies on pioneering yet atheoretically elaborated anecdotes (Corsi and Di Minin, 2014, Cunha et al, 2014). Although reverse innovation draws on established theories, it fails to clearly

identify where the links do exist and where they do not. This induces incremental add-ons to the concept, which reinforce the issues of instability and detachment, and so on. In consequence, the present concept is limitedly actionable for practitioners and insufficiently robust to absorb further research. Presently studied cases of reverse innovation mainly depict large US MNEs developing new products for emerging Asia and subsequently diffusing them from there (Govindarajan and Trimble, 2012). The setting of these cases has been fallaciously echoed as the concept itself (Kamp, 2012; Laperche and Lefebvre, 2012), thus making reverse innovation appear exclusively reserved for enterprises of particular size or equity structure (large MNEs), from a particular origin (from the Triad, particularly the US), or with particular geographic focus (mainly China and India).

The primary aim of this paper is hence to propose a reconceptualization of reverse innovation actionable by any enterprise, irrespectively of its size, equity structure, origin, or country constellation in which it operates. In order to increase the actionability, the linkages between the repositioned concept and major streams of related managerial literature should be identified. Finally, the reconceptualization should be backward-compatible and largely accommodate extant literature on reverse innovation.

The approach towards this goal is reflected in the structure of the paper. Following section presents the evolvement of reverse innovation and identifies five roles subordinate to the concept (e.g. the acting enterprise) along with the evolvement of their present interpretations. For each interpretation, the paper poses one critical question, on which is then analytically reflected in a separate section. Each of these five sections separately re-interprets the respective role. Subsequently, all re-interpreted roles are synthesised to propose understanding reverse innovation as a template applicable to any constellation consisting of a particular enterprise, its old and a new primary market for innovation. By customising this template, the enterprise needs to determine a

managerial response aligned with its specific situation regarding exogenous and endogenous distances to the new primary market for innovation. Major implications of the repositioned concept are subsequently discussed in a separate section. The final section concludes by highlighting the main contributions of the paper and by suggesting future research avenues.

2. Evolvement of Reverse Innovation

Few years before the inception of contemporary reverse innovation, Brown and Hagel (2005) used the term “innovation blowback” to warn Western MNEs from disruptive management practices coming from Asia, which could diffuse to developed countries and threaten established value networks. Western MNEs should respond by specifically targeting lower-income consumers in emerging markets, taking innovative products from emerging markets back home, and using them in new categories there. Similarly, Deloitte (2006) does not mention reverse innovation either, yet it reports on new products that eventually diffused from emerging to developed markets. One of these products is Renault’s inexpensive Logan car, which was initially designed in Romania for Eastern European markets, but which finally became popular in Western Europe as well. Logan is the main theme of a book in French by Jullien et al. (2012), but these authors equally do not mention reverse innovation or its French counterpart (“l’innovation inverse”).

The term “reverse innovation” and the phenomenon of innovations diffusing from less to more developed countries were first linked by Immelt et al. (2009) to collectively address disruptive medical devices by General Electric (GE) that were developed for China and India before eventually diffusing to the US. This conceptualisation has been drawn on by Govindarajan and Ramamurti (2011) to refer to cases “where an innovation is adopted first in poor (emerging) economies before ‘trickling up’ to rich countries” (p. 191). In these sources, reverse innovation is defined by the diffusion path from less to more developed countries embedded in *any* MNE; this

initial interpretation we call *first generation concept*. Despite some variations regarding e.g. characteristics of innovation diffused, Hang et al. (2010), Fry et al. (2011), Kamp (2012) and Burger-Helmchen et al. (2013) may equally be assigned to this generation.

A different nuance has been introduced by Govindarajan and Trimble (2012) and Laperche and Lefebvre (2012). Reverse innovation is still defined by the path of diffusion, as “any innovation that is adopted first in the developing world” (Govindarajan and Trimble, 2012, p. 4). However, the concept assigns to this path of diffusion a strategic approach for MNEs from developed countries. While developed markets are becoming saturated (Osenton, 2004), developing countries “are likely to account for at least two-thirds of world GDP growth for decades to come” (Govindarajan and Trimble, 2012, p. 8). In order to tap into this potential, Western MNEs need to consider local product environment and innovate specifically for emerging markets, rather than to modify existing products through de-featuring and substitution (“glocalisation”). Instead of selling aged technology, MNEs need to recombine the most novel technologies so as to offer 50% of performance at 15% of the price. Introducing these disruptive innovations to untapped market segments of developed markets would even multiply opportunities for Western MNEs. They may pursue reverse innovation for defensive reasons as well, to inhibit “emerging giants” (Khanna and Palepu, 2006), i.e. raising MNEs from emerging markets. Laperche and Lefebvre (2012) see this strategic approach to consequently include another stage of globalisation of R&D activities, which are performed upstream in developing countries. We call this *second generation concept*: the strategic importance of reverse innovation for particular enterprises is emphasised as compared to first generation concept.

That being said, the concept seems doomed to evolve further. Diffusion paths have become blurred in second generation concept; innovations diffusing from one to another developing country are considered reverse even though there is no certainty that they will come to developed

countries one day (as in the case of Procter & Gamble's "Naturella"; Govindarajan and Trimble, 2012). Concomitantly, the strategic focus dilutes; a recent paper by von Zedtwitz et al. (2015) distinguishes 10 categories of reverse innovation, grouped in weak and strong reverse innovation depending on which of four phases of the linear innovation process (concept; development; primary market diffusion; secondary market diffusion; Godin, 2006) take place in advanced respective developing economies.

At the first glance, the roles involved might nevertheless appear intuitively clear (Table 16). Given the environmental setting (dichotomy of levels of development and paces of growth), the actor is attracted by the stimulus, i.e. by emerging markets. Emerging markets become the target to actor's specific innovation and the origin of diffusion, which eventually reaches developed markets in general (first generation) or the actor's home in particular (second generation). However, subordinate roles and terms turn imprecise after a closer inspection, particularly so the geo-economic ones. For example, there is no consensual definition or enumeration of emerging markets, while the purported dichotomy of levels of development excludes most entities classified as middle-income economies (WBDI, 2013). Additionally, it is not clear why reverse innovation as a potential source of competitive advantage should be exclusively reserved for MNEs. Yet if reverse innovation is accessible to small and medium enterprises (SMEs) as well, it equally becomes unclear why particularly SMEs could not look for reasonable opportunities in emerging markets much smaller than India, China, or Mexico.

Role	Current interpretations	Critical question
Actor	<p><i>First generation:</i> MNEs from either developed or developing countries (Govindarajan and Ramamurti, 2011)</p> <p><i>Second generation:</i> MNEs from the Triad, particularly those from the US (Govindarajan and Trimble, 2012)</p> <p>Both generations: Reverse innovation is being enacted at the intersection of innovation management and international business (von Zedtwitz et al, 2015).</p>	What is International Business: MNE or International Management?
Stimulus to innovate and the origin of reverse innovation	Both generations: Emerging <i>markets</i> (Immelt et al, 2009) or <i>economies</i> (Corsi and Di Minin, 2014) stimulate the actor to innovate. As examples of emerging markets/economies serve <i>countries</i> with high rates of economic growth, particularly India and China.	What is emerging to an enterprise: Countries, economies or markets?
Final destination of reverse innovation	<p>Both generations: Reverse innovation eventually diffuses to developed markets (Immelt et al, 2009; Govindarajan and Trimble, 2012).</p> <p><i>Add-on second generation:</i> Reverse innovation particularly diffuses to the “home” of the actor from a developed country.</p>	What is home to an enterprise?
Stage (environment) to reverse innovation	<p>Both generations: Emerging and developed markets represent a dichotomy; emerging markets are at a lower level of development but grow faster, which creates business opportunities to the actor and hence the stimulus to innovate. In order to tap into these opportunities, reverse innovation requires novel and/or recombined technological solutions (Govindarajan and Ramamurti, 2011).</p> <p><i>Add-on second generation:</i> The actor largely draws on own technological base (Govindarajan and Trimble, 2012; Laperche and Lefebvre, 2012).</p>	What if not all markets are either developed or emerging?
Reversal of innovation	Both generations: Geographic paths of innovation diffusion are opposite to those underlying the IPLC theory (Immelt et al, 2009; Govindarajan and Trimble, 2012; Kamp, 2012)	What is reverse to whom?

Table 16: Evolving interpretations of the roles subordinate to reverse innovation

Unstable definitions, imprecise terminology and applicability restrictions make reverse innovation limitedly actionable to academics and practitioners alike. Admittedly, terminological issues largely apply to both innovation and international business, that is, to the fields at the intersection

of which reverse innovation resides. Yet these fields lie on stable theoretical fundamentals, so they are less sensitive to shakes by vague terms. In contrast, reverse innovation and the whole stream of related concepts – Gandhian innovation (Prahalad and Mashelkar, 2010), cost innovation (Williamson, 2010), jugaad innovation (Radjou et al, 2012) etc. – lack coherence and solid theoretical position (Cunha et al, 2014). In absence of robust theories, robust concepts are the more needed. As a frame enacting all subordinate roles, however, reverse innovation requires that these roles be firstly critically reflected on and robustly repositioned, for which we employ the respective question from Table 16. Unless otherwise noted, the point of reference to this analysis is the interpretation common to first and second generation concept.

3. What is International Business: MNE or International Management?

Reverse innovation is a phenomenon “at the intersection between innovation and international business” (von Zedtwitz et al, 2015, p. 12). Yet in international business, “the term business can be defined as a firm [i.e. as a structure] or as an activity. If the former, it is synonymous with multinational enterprise; if the latter, it is not” (Wilkins, 2009, p. 5). We use these terms as follows. For the structural perspective, the term *multinational enterprise (MNE)* is used. According to Dunning and Lundan (2008), multinational enterprises are defined as firms that establish foreign subsidiaries by engaging in foreign direct investment (FDI). In contrast, *international management* refers to border-spanning managerial activities of any enterprise. The term *international business* commonly refers to both perspectives.

The above is quite straightforward but of a great importance. Most documented cases of reverse innovation definitely come from international *business*. The pioneering case involved General Electric, a large US MNE, and its international innovation management spanning India, China and the US (Immelt et al, 2009). In seven out of eight cases listed, Govindarajan and Trimble

(2012) classify the actors as US MNEs. However, it is not plausible that reverse innovation is exclusively reserved for MNEs, even though MNEs may be more prone to it given their international equity presence. Consequently, we propose understanding reverse innovation as a phenomenon pertinent to innovation and international *management* of any enterprise, be it an MNE or not. For instance, reverse innovation may be pursued by so called “born globals” as well, that is by agile, innovative SMEs that pursue a global approach from their very inception (Madsen and Servais, 1997). SMEs may be even “born in reverse”, i.e. they may pursue reverse innovation as a crucial part of their start-up business model right away.

4. What is Emerging to an Enterprise: Countries, Economies or Markets?

Extant literature heavily relies on geo-economic classifications so as to conceptualise reverse innovation. However, subtle issues arise due to the absence of authoritative definitions and inconsistency among major sources. For instance, the World Bank (WBDI, 2013) classifies *countries* and *economies* (the former politically independent) accordingly to the income, whereas the United Nations (UNO, 2013) classifies *economies* by primarily considering their institutional development. As a consequence, for the United Nations, middle-income EU members Bulgaria and Romania are developed while high-income Arab Gulf states, Israel, Singapore and South Korea are developing; the World Bank classifies these countries exactly the other way round. *Emerging markets* are primarily listed by financial intermediaries such as Dow Jones (2014), IMF (2014), Morgan Stanley (2014) and Standard & Poor’s (2014) to suggest “progress, uplift and dynamism” of *financial* marketplaces (The Economist, 2008). Unfortunately, only fractions of these lists intersect, while of those countries consensually considered emerging markets, some are simultaneously classified as developed economies by the United Nations (e.g. Hungary and Poland). Relying on imprecise geo-economic terms might have been a minor issue at early lifecycle stages

of the concept of reverse innovation, when its clarity was traded off for attracting academics' and managers' attention. Yet coupled with its popularity and theoretical detachment, the concept gradually reaches a critical stage as the terminological ambiguity diminishes its practical actionability and theoretical integration capability. Particular confusion arises with regard to the stimulus for (i.e. origin of) reverse innovation.

For example, Immelt et al. (2009) define reverse innovation as specifically developing products for emerging markets like China and India and then distributing them globally. The final destination of reverse innovation is defined as a developed country, with Europe, Japan and the US serving as examples. Consequently, innovations from South Korea diffusing to Bulgaria or Romania would be reverse in this notion, although South Korean GDP per capita is almost three times the Romanian or Bulgarian in nominal terms, and double at purchase power parity (PPP; WBDI, 2013). What is more, all these countries – India, China, South Korea, Bulgaria and Romania – are listed as emerging markets by the IMF.

Govindarajan and Ramamurti (2011) are only marginally more specific; they interchangeably use two groups of terms: industrialized, developed or rich countries as one group, and “emerging markets”, “developing countries” or “poor countries” as the other. The former group includes the Triad of North America, Western Europe and Japan, while the latter includes all other countries. This implies that several countries among the world's top 30 richest would be poor, developing and emerging since they do not belong to the Triad, for example Australia, New Zealand and Singapore. Consequently, innovations diffusing e.g. from Singapore to Japan would be reverse, even though GDP per capita of Singapore is significantly higher than the Japanese in both nominal and purchase parity terms.

Finally, Govindarajan and Trimble (2012) use “emerging markets” as a synonym for “poor countries”, and define the latter supposedly precisely, as countries with GDP per capita at PPP of USD

23,499 or less. However, Russia's GDP per capita at PPP was USD 23,589 in 2012 (WBDI, 2013), thus implying that the country is not an emerging market in the sense of reverse innovation, although consensually considered as one of emerging markets par excellence.

The key to a robust reconceptualization lies in recalling that the actor is a firm, so the stimulus for reverse innovation should also be understood from the firm-level perspective. Perspectives of major financial intermediaries are coarse-grained and may serve only as a rough proxy here; finally, in any given country, there is only one financial market. From the socio-economic perspective, however, the market in any given country is tiered. In the particular case of developing countries, the local markets are four-tiered (Prahalad and Lieberthal, 1998). Upper tiers of relatively wealthy customers (global and "glocal" tier; Khanna and Palepu, 2006) remain thin; exactly this lack of affluence pushes the stimulus for reverse innovation further down the socio-economic pyramid, to the local tier of emerging middle class (OECD, 2010) or even to the poorest yet most populous tier (the "bottom of the pyramid"; Prahalad, 2005).

In sum, the actual stimulus for reverse innovation is any untapped foreign *market segment* that emerges to the enterprise in question. Raising middle class in populous countries like India or China will potentially yield high payouts for any enterprise, not only for MNEs from the Triad. Yet depending on the size of the enterprise and its value proposition, targeting untapped market segments in smaller countries may also represent a reasonable business opportunity. Note that the untapped market segment may also emerge in a country at a higher level of development by some measure, as in previously mentioned cases of South Korea and Romania, or Singapore and Japan.

5. What Is Home to an Enterprise?

To put it bluntly right away: Using development levels of geo-economic entities to categorise enterprises fairly oversimplifies the matter. Volkswagen is maybe intuitively a German MNE, but Volkswagen cannot be at home in all 36 developed countries (IMF, 2014) only because Germany is developed. Cultural, administrative, geographical and economic differences exist among developed countries as well (Ghemawat, 2007), so an enterprise may have different brandings and target different income groups even in countries with similar levels of development. Some of Volkswagen models are hence exclusively marketed to North America, while a majority of units sold there is assembled in Mexico anyway.

International equity relationships additionally challenge the notion of a level of development as the home to an enterprise. For example, Land Rover is headquartered in the United Kingdom, but owned by Tata Motors, which is in turn headquartered in India. Consequently, it is questionable to classify Land Rover as a “pure” MNE from a developed country, or Tata Motors as an MNE from a developing country. Each company is managerially embedded in both levels of economic development, even though certainly to a different extent.

Referring to a single country as the home of an enterprise does not capture the whole story either. The locations of headquarters are misleading, as they are selected depending on factors such as infrastructure, tax and wages level, and spatial industry concentration (Strauss-Kahn and Vives, 2009), or “in response to the demands of external stakeholders, in particular global financial markets” (Birkinshaw et al, 2006, p. 681). The geographical location of R&D activities is equally an unreliable indicator given the globalisation of R&D in general and the relocation to developing countries in particular (Asakawa and Som, 2008; Laperche and Lefebvre, 2012; UNCTAD, 2005). Similar issues apply to the geographic distribution of sales as a potential criterion. For

example, Bombardier Aerospace is headquartered in Canada, but it traditionally derives the biggest share of its revenues in the US (Deloitte, 2010).

More generally, Rugman and Verbeke (2004) find that a majority of large MNEs have a regional rather than national or global character, as they derive revenues mainly from a particular geographic region. This insight may partly help, yet it still leaves some issues remaining given that geographic regions are not necessarily homogenous regarding the levels of economic and institutional development (e.g. Eastern Asia, East or South-East Europe).

In sum, usual approaches to define a home to an internationally operating enterprise in general and to an MNE in particular may raise as many questions as they manage to answer. The key for resolving this issue is to recall once more that reverse innovation is a phenomenon at intersection of international and innovation management. From the perspective of the latter, a home to an enterprise may be either a region, or a country, or an income group, or any other primary market for which the enterprise has been innovating by default. For example, from the perspective of Vernon's (1966) initial international product lifecycle (IPLC) theory, the default primary market for innovation by US enterprises have been the US itself. Updated IPLC theory (Vernon, 1979) extends this approach to Japanese and European enterprises, whose innovations primarily target Japanese (respectively a European) market or a segment thereof. In contrast, for many enterprises from smaller (developed) countries, primary markets for innovation have been abroad, in larger developed countries (Buckley and Ghauri, 2004).

That all being said: An outside assigning of the default primary market for innovation as a "home" to an enterprise is by far less important than managers of this enterprise appropriately assessing the matter. They need to answer the question for which market or market segment – defined socio-economically, geographically or otherwise – their enterprise used to traditionally innovate. In context of reverse innovation, that is home. Note however that the home in this sense

will be likely disrupted – and gradually shifted – by the arrival of reverse innovations, which may attract over-served low-end consumers (low-end disruption; Christensen, 1997) or consumers for whom the non-consumption used to be the best previous option (new-market disruption; Christensen and Raynor, 2003).

6. What If Not All Markets Are either Developed or Emerging?

Extant literature on reverse innovation assumes two dichotomic categories of geo-economic entities, the one developed and the other developing or emerging. It is only very recently that von Zedtwitz et al. (2015) discuss possible inclusion of further categories in the concept, such as fast-follower, least developed, or newly industrialised countries. While this idea represents a notable depart from the dichotomic approach, a justification is missing why particularly these categories should be considered. This is by no means to advocate more, less or other enumerated country *categories* be included. Rather, we suggest opening the concept for *all countries*.

Any categorisation based on a given continuous property ignores the fact that the distribution of countries along this property will equally be continuous rather than discrete, with most countries being in the middle of the distribution rather than towards upper or lower bound. For instance, in terms of income per capita, the World Bank assigns 103 economies (or roughly a half) to the middle-income group, further subdivided in lower-middle and upper-middle. Literature on reverse innovation has studied very few cases from these economies, primarily from India (lower-middle income), China and Mexico (both upper-middle), while Brazil (upper-middle) is at least mentioned as a potential origin of reverse innovation. However, there is no plausible reason why remaining 99 middle-income economies should be excluded from the concept, nor why those included should always play the same role. For example, Chinese GDP per capita at purchase power parity is approximately a fifth of US American, but twice the Indian; Brazilian is almost a

third of US American, but three times the Indian (WBDI, 2013). Even though such cases have not been studied so far, Brazil and China could hence be either or both the origin of innovations departing to the US and the destination of those arriving from India.

This insight has important implications on technological flows involved. Extant literature proposes that the actor applies novel technological solutions when pursuing reverse innovation. Existing technologies need to be recombined, adapted, and/or extended so as to fit into product environments in less developed host countries, and finally deployed so as to receive innovation in return. This is well in line with Fabrizio and Thomas (2012), who note that geographic paths of innovation and technology diffusion may differ. In presently documented cases of reverse innovation, these paths are exactly mirrored, as actors are MNEs from the Triad that leverage on ownership of technologies in same way. However, enterprises from middle-income economies may or may not possess technological advantages when pursuing reverse innovation at a slightly lower level of development; at a slightly higher one, they may but do not necessarily have to compensate for technological disadvantages. Even if they do not necessarily possess cutting-edge technologies, these enterprises may still possess the capacity to absorb them. Enterprises from middle-income economies could hence serve as technology brokers that insource technology from a higher level of development so as to absorb and finally pass it through in a customised form to a lower one, eventually receiving innovation in return. As a consequence, this may make reverse innovation potentially resemble open innovation (Chesbrough, 2003).

In conclusion, the setting for reverse innovation may include countries of any level of development from a continuous distribution, various paths of technology diffusion, or actors drawing on either or both internal and external technologies. This makes the process of reverse innovation potentially much more diverse than what extant literature implies; the process may span more than one enterprise and virtually any number of total steps. However, reverse innovation concep-

tually remains a two-stage diffusion process, with the first stage taking place in the new primary market and the second stage targeting secondary markets. Note however that these two stages do not necessarily have to be linear and clear cut (Godin, 2006) as they may chronologically overlap.

7. What Is Reverse to Whom?

Conceptual inversions of innovation occurred long before the concept of reverse innovation as such. For example, demand-pull model of innovation (Schmookler, 1966) inverted the previous technology-push model by relocating the main stimulus downstream, from new technology input to existing market demand. In case of reverse innovation, the point of reference of the reversal is the international product life cycle (IPLC) theory (Vernon, 1966, 1979). There are at least two crucial issues with this inversion purported implicitly e.g. by Immelt et al. (2009) and Govindarajan and Trimble (2012), or explicitly by Kamp (2012).

First, the levels of analysis are incompatible, hence hardly contrastable. The IPLC theory takes an aggregated economic perspective so as to overcome the Leontief (1953) paradox, i.e. the inadequacy of previous theories of international trade and FDI flows. Quite differently, reverse innovation takes the managerial perspective of a single enterprise.

Second, there is hardly anything reverse per se in innovations diffusing from e.g. China or India as first generation concept implies. Historically, these countries used to be major economic powers, accounting for roughly a half of the world's GDP until early 19th century (Maddison, 2001). Even though much time has passed by since, impressive examples of ancient innovations that diffused from China have remained well known, such as silk, paper or gun powder. Certainly, contemporary innovations from less developed countries are usually considered less numerous or of a lower quality. In fact, it is quite straightforward that globally new technological innovations will more frequently occur at a higher level of development. However, innovation at the firm

level does not need to be globally new (OECD, 2005). Taking the US trade deficit with China in manufactured goods as a proxy (USITC, 2013), contemporary innovations at the firm level seem to flow in greater quantities from China to the US than vice versa.

Consequently, we object to the notion of first generation that any innovation flowing from less to more developed countries is reverse. Within Chinese innovations flowing to the US, only innovations by US (and not Chinese) firms should be seen as reverse. Attracted by business opportunities that could not have been tapped into with existing products, US enterprises innovated specifically for China and diffused the outcome in first instance locally. Subsequently, the outcome is diffused to the US as well. A previously secondary market for innovation (China) has become the new primary one, while the previously primary market (the US) has become secondary. The reversal of innovation hence actually means the switching of roles between the primary and a secondary market for innovation. Second generation concept indirectly implies a reversal in this sense for actors from the Triad; however, both generations fail short of explicitly recognising the relativity of actors' perspectives. Medical devices by GE and Tata's Nano car share the same diffusion path from India to developed countries, but this path is embedded in different managerial contexts. GE diffuses its new medical devices from a previously secondary market for innovation to the previously primary one. In contrast, Tata diffuses Nano from its default market for innovation to secondary ones; from Tata's point of view, there is hardly anything reverse in that. Emerging market for innovation and the traditional one are hence inseparable from the actor; what is reverse for GE is the business as usual for Tata and vice versa. As a consequence, managerial responses to challenges of reverse innovation will differ. US-American firms will be constrained by scarcity of affluent customers when pursuing reverse innovation in India, so they will likely respond with frugal innovation ("extreme efficiency to some essential need"; Cunha et al, 2014, p. 206). In contrast, Indian enterprises pursuing reverse innovation in the US will more

likely suffer from a comparative scarcity of material resources and respond by bricolage (“making do what is at hand”; Baker and Nelson, 2005, p. 329).

8. Synthesis: The Play of Reverse Innovation Re-Interpreted

Put together in a play, re-interpreted roles subordinate to reverse innovation give the following plot template. The actor (any enterprise) is attracted by the stimulus, i.e. an untapped foreign market (segment) that emerges as a major source of business opportunity and growth from its perspective. The actor innovates specifically for that market, for which either or both, own and insourced technologies may be used. The previously emerging market hence becomes the new primary market for actor’s innovation and the origin of further diffusion. Likely but not necessarily in an adapted form, reverse innovation eventually reaches the market for which the actor used to innovate by default until it focused on the emerging, i.e. new primary market. The arrival of reverse innovation in the formerly primary market may cause either or both low-end and new-market disruption. In essence, the reversal underlying the plot template means that the primary and a secondary market for actor’s innovation switch their roles. Note that this is a plot *template*, which every actor has to adapt to its specific situation. The level of analysis is the acting enterprise, but the unit of analysis is a new product or service contradicting the dominant innovation logic at the firm level. Within reverse innovation reconceptualised this way, second generation concept becomes a special case or a sub-template, in which the actor is a Western MNE, the stimuli are definable by geo-economic criteria, and the traditional primary market for the actor’s innovation equals to a whole geographic or geo-economic entity (Table 17).

Role	First generation concept	Second generation concept	Re-interpretation of the role
Actor	An MNE	An MNE from the Triad	Any enterprise
Stimulus to innovate and the origin of reverse innovation	Emerging market in the sense of major financial intermediaries, i.e. a whole less developed geo-economic entity with high rates of economic growth.	Emerging market in the sense of major financial intermediaries, i.e. a whole less developed geo-economic entity with high rates of economic growth.	Any market (segment) that emerges to the actor as the new primary one for its innovation.
Final destination of reverse innovation	A geo-economic entity at a higher level of economic development.	The geo-economic entity “home” to the actor.	Any formerly primary market for which the actor used to innovate by default.
Stage (environment) to reverse innovation	A dichotomic geo-economic constellation including an emerging and a developed market.	A dichotomic geo-economic constellation including an emerging and a developed market; the actor leverages on own technology.	Any constellation of levels of development from a continuous distribution; the actor may draw on either or both internal and external technology.
Reversal of innovation	Geographic paths of innovation diffusion are in (supposed) contradiction to the IPLC theory.	Geographic paths of innovation diffusion are in (supposed) contradiction to the IPLC theory.	Switch of the roles between the primary and a secondary market for innovation i.e. innovating in contradiction to the primary market focus of the traditional innovation logic.

Table 17: Re-interpreted roles subordinate to reverse innovation in comparison

The process of marketing strategy development normally flows from segmentation via targeting to positioning (Kotler and Keller, 2007). However, marketing strategy development for reverse innovation goes through this process initially backwards and then forwards. The acting enterprise starts from its current positioning and identifies its old primary market for innovation. Subsequently, the enterprise needs to bring this insight into identifying the emerging market aimed at as the primary one in future, and to develop and carry out a new value proposition embedded in a new or altered business model (Osterwalder and Pigneur, 2010; Teece, 2010). Note that a simple

assumption that the old primary market equals to a whole country, e.g. the country of actor's headquarters, will very likely be wrong. If GE in Immelt et al. (2009) had targeted the whole US market (and not only some segments thereof) before developing new medical devices for India and China, new devices could not eventually have been introduced back to the US.

When aiming at a new primary market abroad, enterprises have to overcome the liability of foreignness in general (Zaheer, 1995), and a set of distances (cultural, administrative, geographic, and economic; Ghemawat, 2007) or “gaps” (in consumer preferences, income levels, infrastructure and legal environments; Govindarajan and Trimble, 2012) in particular. These gaps or distances are *exogenous* to the constellation consisting of an enterprise, its old and a new primary market for innovation. Concomitantly, however, enterprises engaging in reverse innovation have to deal with *endogenous* gaps, the size of which is influenced by the exogenous ones:

Market knowledge gap: The actor usually lacks a deep understanding of required functionality and product environment in the new primary market. The further away – geographically, economically or otherwise – the new primary market is from the old one, the higher also the liability of ignorance about the consumers and their needs. For Western enterprises, difficulties peak at the so called bottom of the pyramid in developing countries (Prahalad, 2005).

Business model gap: Innovating for a new primary market equals developing a new value proposition, which is the kernel of a business model including further blocks (i.e. key partners, activities, resources, distribution channels, cost and revenue streams; Osterwalder and Pigneur, 2010). A new value proposition necessarily requires updating the business model; the higher is the gap between the old and the new business model, the higher also incumbent inertia (Lieberman and Montgomery, 1988) and detrimental legacy of dominant managerial logic underlying innovation by default (Prahalad and Bettis, 1986).

Technology gap: Ownership and absorptive capacity of technologies are potential sources of competitive advantage, so the traditional market for innovation pushes the actor's technological roadmap in a certain direction, on which the actor builds its core capabilities. In a new primary market, however, technological core capabilities may turn a burden (Leonard-Barton, 1992), as the actor needs to address fundamentally different needs, or at least fundamentally different conditions. The higher the exogenous distances are, the higher the need to recombine, adapt or extend the actual or absorbable technological base.

All in all, reconceptualised reverse innovation is a template employable by any enterprise that responds to the shift in stimuli by switching its primary innovation effort to a foreign market or market segment emerging to the enterprise in question as the new primary one. Rather than offering one-size-fits-all prescriptions, reverse innovation always needs a customization to the specific constellation consisting of the enterprise in question, the old and a new primary market for innovation. By customising this template, the enterprise needs to determine a specific managerial response aligned with both exogenous and endogenous distances to the new primary market.

9. Discussion

Reconceptualised reverse innovation fundamentally objects to the first generation concept; a mere diffusion from less to more developed countries is neither sufficient nor necessary a criterion. As for second generation concept, our notion concurs with it inasmuch as both recognise strategic implications of switching primary markets for innovation. Yet reconceptualised reverse innovation becomes accessible by any enterprise, and robust to development levels and flows of technology. The actual reversal is reconceptualised relatively to the enterprise's prior innovation management, rather than relatively to its geo-economic environment. From the perspective of this

paper, reverse innovation is hence a phenomenon at the level of a new product or service that contradicts the innovation by default at the firm level.

Challenges to reverse innovation are tough; it needs to overcome high exogenous and endogenous distances so as to tap into an emerging primary market. In contrast, enterprises' traditional innovation deals with comparatively low distances along each dimension (see Figure 10 for illustration). In this framework of total distance, we position glocalisation as a mode of innovation overcoming hardly any endogenous but some exogenous distance. While adaptations are undertaken in order to partly absorb some environmental changes, e.g. a portion of difference in income and consumption preferences, the actual value proposition underlying glocalisation essentially remains the same. Reverse innovation has to go far beyond glocalisation along each dimension of distance; this relative positioning corresponds to second generation literature.

In contrast to glocalisation, “domestic” disruptive innovation overcomes a good deal of endogenous but small to medium exogenous distance. Enterprises innovating in this mode target market segments bordering their traditional market for innovation, so they usually take little challenge regarding e.g. cultural preferences or legal environment. However, endogenous distances to overcome are considerable given that disruptive innovation targets market segments over-served or not served at all by the enterprise's dominant innovation logic (Christensen, 1997; Christensen and Raynor, 2003). Disruptive innovation hence requires familiarity with different customer needs, recombining technology, and changing of business models. Its relative positioning to reverse innovation is in line e.g. with Corsi and Di Minin (2014), for whom reverse innovation essentially equals disruptive innovation with a geographical dimension added.

Generally, the bigger is the market stimulus to innovate the higher also the total distance that the stimulus will overcome. As a consequence, critical stimulus sizes needed to induce the actor's innovation (illustrated by the bubble size in Figure 10) increase from innovation by default over

glocalisation and disruptive innovation to reverse innovation. This explains e.g. why GE developed its low-end medical devices for India and China and diffused them from there to low-end market segments in the US (Immelt et al, 2009), although it could theoretically have gone the other way round. The stimulus from the low-end market in the US was not big enough for domestic disruption, but the stimulus from India and China was above the critical threshold for reverse innovation.

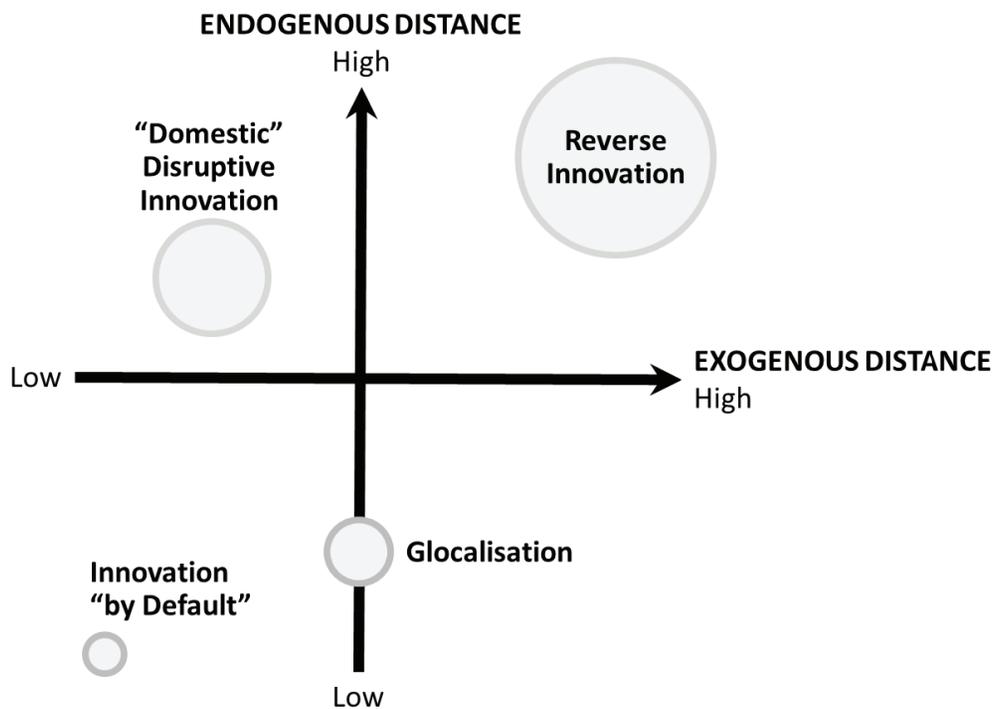


Figure 10: Illustrative positioning of reverse innovation in the total distance framework
Bubbles sizes illustrate the critical stimulus size needed to induce the actor’s innovation

Extant literature largely fails to reconcile reverse innovation with established theories and frameworks (Cunha et al, 2014; Corsi and Di Minin, 2014); this applies most regrettably to the “fathers” of the concept (Immelt et al, 2009; Govindarajan and Trimble, 2012). The following identification of linkages between the re-positioned concept and major streams of management literature will hence support the objective of making reverse innovation more actionable.

To start with, reverse innovation draws on global strategies in general and suggests a shift towards local responsiveness within the transnational model in particular (Bartlett and Ghoshal, 1989). In an emerging foreign market bearing the stimulus to innovate, this eventually promotes the strategic option of adaptation (Ghemawat, 2007). Our notion of reverse innovation as a customisable template draws on Ghemawat's managerial framework, which urges that internationalisation strategies generally be tailored to a particular constellation including an enterprise, its home and the targeted host country. However, Ghemawat considers exogenous (administrative, cultural, economic and geographic) distances only. Our concept extends this idea by adding the dimension of endogenous distances, which in turn draws on resource based view and the double-edged sword of core capabilities. These may turn "core rigidities" (Leonard-Barton, 1992), with the normative core being manifested in the dominant managerial logic underlying innovation by default (Prahalad and Bettis, 1986). In fact, innovation by default itself may be seen as both, a valuable top-level capability and a detrimental rigidity, the latter of which the actor attempts to overcome by pursuing reverse innovation.

Our definition of the home to an enterprise, coupled with its deliberate self-disruption by the eventual arrival of reverse innovation, clearly connects reverse and disruptive innovation (Christensen and Raynor, 2003). Additionally, this indicates that the enterprise rearranges its activities in response to the shifting stimulus to innovate, which refers to the dynamic capability approach and the mechanisms of sensing, seizing and reconfiguring of resources (Eisenhardt and Martin, 2000; Teece, 2007), with multi-project lineage management as a model to reconfigure the actor's innovation activity and shape its future technological trajectory (Maniak and Midler, 2014).

Linking reverse innovation and the literature on innovation under scarcity, Cunha et al. (2014) see reverse innovation as a mode of innovating in environments where affluent customers are scarce. Repositioned concept concurs with this notion only as long as the acting enterprise is a

large Western MNE and the stimulus in markets at a substantially lower level of development. Yet MNEs from less developed countries will rather suffer from a lack of resources when pursuing reverse innovation. SMEs from middle-income economies innovating e.g. for India will even likely be sandwiched by two dimension of scarcity: own lack of resources and environmental lack of affluent customers.

Finally, note that previous concepts take for granted that the entire process of reverse innovation remains within a single firm. In contrast, this paper allows for the process to span more than one enterprise, e.g. by insourcing technology (open innovation; Chesbrough, 2003).

10. Conclusion

Current research recognises that innovation may occur everywhere, and not only in the developed world (Vives et al, 2010). The concept of reverse innovation doubtlessly deserves credit for its contributions to this change of perception. However, previous conceptualisations position reverse innovation primarily in relation to the shift of consumption power towards less developed countries. This distracts from the actual reversal, which resides at the level of a new product or service being innovated in contradiction to the primary market focus of traditional innovation logic at the firm level. As a consequence, reverse innovation has been at risk of becoming limitedly applicable to both theory and practice.

Our paper makes three major contributions in this context. Firstly and most importantly, the re-conceptualised reverse innovation consistently takes the firm-level perspective and becomes a customisable template employable by any enterprise. Secondly, linkages to major streams of related management literature are identified, thus mitigating the concept's current segregation and increasing its practical applicability. A practical focus notwithstanding, these linkages also indicate bridgeheads from which to progress in federating reverse innovation with previously estab-

lished theoretical findings. Thirdly, extant literature on reverse innovation is smoothly integrated, with second generation concept as a sub-template including large Western MNEs as actors and the stimuli to innovate definable by geographic or geo-economic market segmentation.

Mentioned contributions notwithstanding, some implications of our reconceptualization need to be shed more light on. First, it calls for research on more diverse constellations, for instance on cases enacting SMEs and involving emerging markets in smaller middle-income economies, or at a higher level of development. However, at a given point of time, not every enterprise will have a primary and secondary market for innovation. Thus, future research may equally wish to address positioning of start-ups and “born globals” (Madsen and Servais, 1997) vis-à-vis reverse innovation. Relatedly, academic discussion on comparative advantages and disadvantages of different actors is invited (Burger-Helmchen et al, 2013). For example, while the legacy of innovation by default will more likely constrain large MNEs, major obstacles to SMEs could be more attributable to their comparatively tight financial resources (Knight and Cavusgil, 2004; OECD, 2013). Additionally, the links between reverse and open innovation (Chesbrough, 2003) and more generally the models of processes underlying reverse innovation need further researchers’ attention. Last but not least, while reverse innovation may in best case create a “blue ocean” of uncontested market space for the actor (Kim and Mauborgne, 2004), comprehensive assessments of induced business performance that consider both growth achieved and opportunity cost incurred are yet to come.

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ESSAY C: "External Leverages of Reverse Innovation versus Managerial Core Self-Evaluation"

Abstract

Presently documented cases of reverse innovation contradict the suggestions of previous research by depicting hardly any enterprise that resorts to external leverages in form of open innovation, inter-organisational cooperation or corporate venture capital. Analyzing three cases of reverse innovation by small, resource-constrained enterprises from a middle-income economy, the present paper concludes that these enterprises counter-intuitively resorted only to external leverages compatible with the managing owners' core self-evaluation. Consequently, for future research on the link between executives' individual characteristics and strategic choices regarding the process of reverse innovation, we suggest a theoretical framework of upper echelon theory, core self-evaluation theory, and theories of self-concept maintenance.

Keywords: Reverse innovation; corporate venture capital; open innovation; core self-evaluation; self-concept maintenance.

1. Introduction

Emerging markets have been rapidly increasing their share in the world's economy and are expected to account for the main part of future economic growth (Jain, 2006; Kose and Prasad, 2010, OECD, 2010)⁸. Introduced roughly as "developing products in countries like China and India and then distributing them globally", the concept of reverse innovation emphasises that aiming at business potentials of emerging markets entails specifically innovating so as to address customer needs and/or market conditions fundamentally different from those in developed countries (Immelt et al., 2009: 58). So far, the literature on reverse innovation has uniformly focused on large multinational enterprises (MNEs) from most developed countries, particularly from the US. Most recent research recognises that reverse innovation may enact enterprises of any size, origin, or equity structure, e.g. start-ups or small enterprises (Judge et al., 2015), and/or diverse levels of economic development, e.g. middle-income economies (Radojevic, 2015; von Zedtwitz et al., 2015). Consequently, challenges of reverse innovation depend a good deal on the kind of the enterprise involved. When targeting emerging markets, all foreign enterprises face liability of foreignness (Zaheer, 1995) and unfamiliarity with the needs of less affluent local customers (Cunha et al. 2014; Prahalad, 2005). In addition, large MNEs will likely be constrained by the legacy of traditional innovation logic and core competences (Leonard-Barton, 1992; Prahalad and Bettis, 1986). In contrast, small and mid-sized enterprises (SMEs) are more agile, may follow a global approach or focus on emerging markets right away (Judge et al., 2015; Madsen and Servais, 1997), but frequently suffer from tight resources (Knight and Cavusgil, 2004).

In order to overcome challenges of innovation in general, prior literature proposes resorting to external leverages such as inter-firm "competitive collaboration" (Hamel et al., 1989) or external

⁸ While extant literature largely converges with regard to common characteristics of emerging markets, there is no universal agreement on which geo-economic entities belong to this category (Radojevic, 2015). The present paper draws hence on the enumeration by Hoskisson et al. (2000).

technologies and ways to the market (open innovation; Chesbrough, 2003; West and Bogers, 2014). Particularly when innovating for emerging markets, enterprises are additionally advised to take equity stakes in agile small and medium sized enterprises (corporate venture capital; Chesbrough, 2002), co-invent custom solutions, and/or cooperate with non-traditional partners such as local businesses, non-governmental organisations (NGOs) and governmental stakeholders (London and Hart, 2004, Radjou and Prabhu, 2012).

Yet despite this diversity of potential players, complexity of challenges, and variety of external leverages, reverse innovation as a process is currently understood to take place within a single firm or its intra-firm network. For instance, Immelt et al. (2009), Govindarajan and Ramamurti (2011), and Govindarajan and Trimble (2012) explicitly propose that enterprises draw on their own global resource base – not the global resource base in general. Consequently, the main aim of this paper is to address this contradiction in prior literature and to explain why and to which kind of external leverages enterprises do (or do not) resort in reverse innovation endeavours.

Since SMEs from Serbia (a middle-income economy) do not necessarily possess technological assets and usually lack finance (OECD, 2013), we execute an explanatory multiple-case study with three such enterprises. This setting facilitates answering our research question, since external leverages are likely needed and relied on ("heuristic case study"; Thomas, 2011: 515). As embedded technique to analyse empirical data, we employ explanation building. That means that we in fact commence deductively (Saunders et al., 2009; Yin, 2014), from a rather atheoretical initial explanation inferred from previous literature – namely that enterprises would (not) resort to external leverages depending solely on own resource endowment, be it factual or perceived (Weiss et al., 2014). As data uncovered with initial explanation emerge, we continue inductively and eventually identify the link between individual characteristics of decision makers and strategic choices regarding the innovation process. Therefore, we subsequently draw on the upper

echelon theory (Hambrick and Mason, 1984), which essentially states that executives make decisions based on their values, personalities, and interpretations of the strategic situation they face. In a later refinement, Hiller and Hambrick (2005) specifically propose considering the impacts of executives' core self-evaluation. Introduced by Judge et al. (1997), core self-evaluation is defined as "fundamental premises that individuals hold about themselves and their functioning in the world" (Judge et al., 1998: 168). Core self-evaluation is the common kernel of self-esteem, emotional stability, generalised self-efficacy, and locus of control (Johnson et al., 2008), and is essentially akin to the notion of self-concept (Judge et al., 1998). Placing our final explanation within this framework, we eventually argue that an enterprise's resource base determines which external leverages of reverse innovation may *potentially* be resorted to. However, decisions whether these leverages will be *in fact* resorted to, and if so to which extent, are made in a way that maintains the decision makers' self-concept (Carver and Scheier, 1981; Higgins, 1987; Mazar et al., 2008), which may or may not be the optimal decision regarding innovation performance.

The remaining structure of this paper reflects the background of our study, the research design, and the narrative and iterative character of explanation building (Yin, 2014). Next section briefly reviews extant publication base on reverse innovation and conceptualises external leverage as a meta-construct along three dimensions (content, form and purpose). Subsequent section describes our research method, pre-sampling rationale, and cases selected. We then derive an initial explanation, and narratively iterate between empirical results and updated explanations. In order to absorb unexpected empirical data, the subsequent section reviews literature on core self-evaluation, self-concept maintenance and upper echelons, and positions our final explanation within this theoretical framework. Ensuing section discusses alternative explanations, addresses implications, and reflects on validity and reliability of our findings. The concluding section highlights main contributions of this paper, addresses its restrictions, and invites for future research.

2. Literature Review

2.1. Uniformity of the Empirical Base

Despite practical and theoretical importance, emerging markets as the new context of innovation are underresearched in general (Vives et al., 2010), which analogously applies to reverse innovation in particular (Corsi and Di Minin, 2014; Cunha et al., 2014). In fact, our keyword based search in Web of Science database retrieves 16 peer-reviewed articles, two of which we substitute by the book being commented (i.e. Govindarajan and Trimble, 2012) to arrive at a publication base of only 15 items (Table 18). Given that organisational innovation is a multi-dimensional phenomenon (Crossan and Apaydin, 2010), this comparatively small body of literature is additionally scattered around different (although not necessarily mutually exclusive) dimensions of reversal: flow of innovation outcome from less to more developed countries (Govindarajan and Ramamurti, 2011; Hang et al., 2010), re-distribution of roles between headquarters and subsidiaries (Borini et al., 2012; Sartor and Beamish, 2014), and reverse knowledge spillovers from local firms to foreign MNEs in emerging markets (Li et al., 2013).

That being said, the present paper recognises the relativity of strategic perspectives (Wright et al., 2005; Xu and Mayer, 2012) and adopts the predominant understanding (Table 18) as reconceptualised by Radojevic (2015): Reverse innovations are specifically developed for emerging markets by *foreign* enterprises, which may eventually diffuse the outcome to the niches or lower-end segments of traditional markets (Brown and Hagel, 2005; Immelt et al., 2009). The inversion underlying reverse innovation hence essentially means that the primary and a secondary market for the focal enterprise's innovation switch their roles.

Publication	Empirical sample and/or conceptual scope
Borini et al., 2012	Innovation flows from foreign subsidiaries to headquarters of Brazilian MNEs
Corsi and Di Minin, 2014	An anonymous Italian MNE (referred to as “Speres”) innovating for China
Corsi et al., 2014	MNEs from developed countries innovating for emerging markets
Govindarajan, 2012	Harman (a US MNE) innovating for India and China
Govindarajan and Ramamurti, 2011	Any innovation flowing from emerging markets to developed countries; MNEs as actors
Govindarajan and Trimble, 2012	Seven MNEs from developed countries innovating for India, China or Mexico: Logitech, Procter & Gamble, EMC Corp., Deere & Company, Harman International Industries (from Govindarajan, 2012), General Electric (from Immelt et al., 2009), and PepsiCo. Eighth empirical anecdote generally pleads for reverse innovation in health care.
Hang et al., 2010	Four Asian MNEs innovating locally but diffusing the outcome internationally: Galanz, Haier and Yadea (all three from China) and Suzlon (India).
Immelt et al., 2009	General Electrics (a US MNE) innovating for India and China
Judge et al., 2015	GRIT, a US start-up, innovating for India and other developing countries; local users employed as lead-users and potential source of innovation
Li et al., 2013	MNEs from developed countries innovating for China; explicit reference to General Electric (Immelt et al., 2009). Overall scope: knowledge spillovers between foreign and domestic firms in China.
Sartor and Beamish, 2014	MNEs from developed countries offshoring innovation to subsidiaries or subcontractors in emerging markets
von Zedtwitz et al., 2015	MNEs (predominantly from developed countries) innovating for emerging markets; a typology of reverse innovation
Winter and Govindarajan, 2015	MNEs or start-ups from the Triad innovating for emerging markets; stakeholders in emerging markets as potential source of innovation; echoes Judge et al. (2015)
Zeschky et al., 2014a	Four anonymous cases of MNEs from Germany, Switzerland and USA innovating for China
Zeschky et al., 2014b	Undisclosed database of 85 cases of MNEs from developed countries innovating for emerging markets

Table 18: Overview of publications on reverse innovation

When it comes to reverse innovation as a process – or answering the question "how" to innovate (Crossan and Apaydin, 2010) – extant empirical base proves largely uniform (Subramaniam et al., 2015). Most documented cases enact large MNEs from the Triad, particularly the US, that target untapped market segments in India or China. Until 2015, reverse innovation is exclusively

depicted as a closed process: the source of innovation is the actor's global resource base (Immelt et al., 2009; Govindarajan and Ramamurti, 2011; Govindarajan and Trimble, 2012) and the organisational locus either the firm itself or its intra-firm network. It is only very recently that Judge et al. (2015), echoed in Winter and Govindarajan (2015), report on GRIT, a US start-up that developed a wheelchair for developing countries by leveraging on input from local users as a source of innovation. The case of GRIT only implies which diversity of players, specificity of challenges, and variety of external leverages may be enacted in reverse innovation endeavours. We hence elaborate on these aspects in the following subsections.

2.2. Diversity of Players and Environments

Strategy research in emerging markets traditionally focuses on MNEs and two dichotomic groups of geo-economic entities, the one advanced or developed, and the other developing or emerging (cf. Wright et al., 2005; Xu and Mayer, 2012). However, most recent literature increasingly recognises the potential diversity of geo-economic environments. For instance, Hoskisson et al. (2013) generally focus on MNEs from mid-range economies, while von Zedtwitz et al. (2015) propose considering fast-follower, least developed, or newly industrialised countries as potential environments to reverse innovation. Extending this path, Radojevic (2015) proposes that enterprises pursuing reverse innovation could come from any level of development along a continuous distribution. Given their international equity presence resulting from foreign direct investments (Dunning and Lundan, 2008), large MNEs may be still most prone to reverse innovation. However, reverse innovation may pertain to any enterprise, irrespectively of its size and equity structure. For example, reverse innovation may be pursued by so called "born globals", that is by agile, innovative SMEs that adopt a global approach from their very inception (Madsen and Servais, 1997). As in case of GRIT (Judge et al., 2015), some SMEs may be even "born in reverse", i.e.

emerging markets as primary markets for innovation may be an essential part of their start-up business model. In sum, the setting of reverse innovation may hence include countries from any level of development, and enterprises of any size, origin and equity structure. In turn, this implies that challenges to reverse innovation contain a common kernel, but equally so an idiosyncratic periphery that results from the diversity of potential players and environments.

2.3. Complexity and Specificity of Challenges

In general, all enterprises doing business abroad face liability of foreignness (Zaheer, 1995). Interestingly, Un (2011) purports that MNEs enjoy an advantage of foreignness in innovation. However, she is actually pointing to the advantage in diffusion of existing offerings, rather than in creation of new ones. When innovating for emerging markets, particularly for segments further down the economic pyramid, foreign enterprises lack a deep understanding of product environment and required functionality (Prahalad, 2005). The higher the institutional, geographic and economic distance between the host and home country (Ghemawat, 2001; 2007), the higher is also this "liability of ignorance" about product environment, targeted consumers, and their needs. In addition to these exogenous challenges, particularly large MNEs may be endogenously hampered by incumbent inertia (Lieberman and Montgomery, 1988) and internal resistance to potential self-disruptions (Immelt et al., 2009). Previous core capabilities may turn detrimental "core rigidities" (Leonard-Barton, 1992), with dominant managerial logic constraining the course of action (Prahalad and Bettis, 1986). In fact, an MNE's entire prior innovation paradigm may turn a top-level rigidity, which needs to be overcome in order to pursue "clean-slate innovation" (Govindarajan and Trimble, 2012). As another group of potential actors, SMEs will have mirrored advantages and disadvantages (Burger-Helmchen et al., 2013). While their likely advantage could

be their agility, disadvantages will be rather attributable to comparatively tight financial resources (Knight and Cavusgil, 2004).

Extant literature in unison suggests that enterprises recombine, adapt and/or extend existing technologies so as to address peculiarities of emerging markets and eventually receive innovation in return (e.g. Immelt et al., 2009; Govindarajan and Ramamurti, 2011; Govindarajan and Trimble, 2012). Consequently, geographic paths of innovation and technology diffusion may very well differ (Fabrizio and Thomas, 2012). In presently documented cases of reverse innovation, these paths are mirrored, as actors are mainly MNEs from the Triad that leverage on technology ownership. In contrast, enterprises from middle-income economies may or may not possess distinctive technological assets. If they do not, however, they may at least be capable to absorb cutting-edge technologies from a higher level of development and pass them through in a customised form to emerging markets. Depending on the actor's technological base and absorptive capacity, reverse innovation may hence resemble open innovation (Chesbrough, 2003). In short, extant literature clearly indicates which complexity of exogenous and specificity of endogenous challenges enterprises need to overcome in reverse innovation. Depending on actors' comparative position, this may be facilitated by resorting to a variety of external leverages.

2.4. Variety of External Leverages

Innovation generally has two major dimensions: innovation as an outcome (e.g. a new product or service; EC, 1995), and innovation as a process leading to the outcome itself (Crossan and Apaydin, 2010). Leveraging the outcome in the strict sense does not work conceptually: if the outcome does not exist, there is nothing to leverage yet; but if it does, there is nothing to leverage anymore. Instead, potential leverages apply to innovation as a process. As any innovation process consists of two stages, development and diffusion (ibid; OECD, 2005), external leverages of re-

verse innovation may apply to its development and/or diffusion. Obviously, external leverages will be resorted to in order to overcome some kind of challenges. Liability of foreignness (Zaheer, 1995) in general, and institutional, geographic and economic distances between host and home country in particular (Ghemawat, 2001; 2007; Xu and Shenkar, 2002) are certainly such challenges to reverse innovation, yet they apply to the focal enterprise as a whole. As for reverse innovation, the fundamental challenge lies in appropriately matching the nodes at opposite ends of the so called coupling innovation model: market need and technology (Nelson and Winter, 1982; Kline and Rosenberg, 1986). Innovating enterprises need to address fundamentally different market needs or at least fundamentally different market conditions, for which novel or re-combined technological solutions are needed (Govindarajan and Trimble, 2012). This match finally leads to a new value proposition (Ernst et al., 2015) embedded in a new or altered business model (Osterwalder and Pigneur, 2010; Teece, 2010). Finally, it is a piece of common knowledge that development and diffusion of innovation require finance, be it e.g. for developing of the new product or for working capital necessary for its diffusion (Ross et al., 2008). As the content of potential external leverages, we hence consider market knowledge and technology for the development, and equity finance for either, some or all, product development, business model development, and diffusion. Note that we do *not* consider debt finance as an external leverage.

External leverages may materialise in cooperation with other firms (Hamel et al., 1989) or non-traditional partners such as NGOs (London and Hart, 2004; Radjou and Prabhu, 2012), or in open innovation in sense of either or both "libre" openness (access to knowledge free from intellectual property constraints) and "controlled" openness (purposeful acquisition of external or marketing of internal knowledge; West and Bogers, 2014, Wikham, 2013). Finally, instead of starting from scratch, MNEs in possession of sufficient financial resources may resort to corporate venture capital (CVC) and take equity stakes in SMEs that already developed reverse innovations but are

hampered in fundraising for innovation diffusion. CVC investments in reverse innovation would fit in the category of emergent investments, i.e. investments that aim at exploring "a strategic white space – a new market with a new set of customers" (Chesbrough, 2002: 96). Summing up, we conceptualise external leverage as a meta-construct with three properties, or dimensions:

- **Content:** Market knowledge; Technology; Equity finance
- **Form:** Inter-organisational cooperation; Open innovation; Corporate venture capital
- **Purpose:** Product or service development; Business model development; Diffusion

2.5. Reverse Innovation: Nonetheless Innovation in Isolation?

Our literature review clearly indicates the potential diversity of players, environments and challenges involved in reverse innovation. Surprisingly, however, there is only a single documented case of an enterprise resorting to some kind of external leverages (Judge et al., 2015). Rather, it seems that almost all enterprises were able to keep the whole innovation process in-house, and thus practically innovate in isolation. Given the presently small empirical base, it is certainly possible that previous case studies – or empirical anecdotes (Cunha et al., 2014; von Zedtwitz et al., 2015) – focussed on the mere novelty of reverse innovation, rather than on external leverages that focal enterprises (could and/or should) have employed. That being said, the present paper aims at explaining the possible systematic background that this contradiction in extant literature may nevertheless have, i.e. at answering the question why enterprises do or do not resort to external leverages of reverse innovations, and if they do, to which leverages specifically.

3. Initial Explanation

Extant research provides no explicit or reliably derivable theoretical proposition to answer our research question, yet it still implies a possible initial explanation. In most documented cases, enterprises pursuing reverse innovation have been large Western MNEs, from which we infer that actors were likely in possession of technological assets and sufficient finance. Finally, Immelt et al. (2009), Govindarajan and Ramamurti (2011), and Govindarajan and Trimble (2012) explicitly propose that the actor draws on its *own* global resource base – not the global resource base in general. Market knowledge may have been accumulated during previous operations in a particular host country or, if necessary at all, built through collaboration with local stakeholders (Judge et al., 2015; Winter and Govindarajan, 2012). In other words, not resorting to external leverages may be a simple question of self-sufficiency, with actors' technology, finance and market knowledge endowment as the only but explanatory variable. We note however that perceptions about resource adequacy may be more important than the factual adequacy as an objective property (Weiss et al., 2014). Consequently, our initial explanation – or assumption – has been that depending on factual or perceived self-insufficiency, enterprises would opportunistically resort to any external leverage in attempt to improve innovation performance measured by a common metric such as return on innovation spending or time to market (Andrew et al., 2010).

4. Research Design

4.1. Research Strategy and Approach

Essentially, this paper seeks to answer a “why” question: Why and to which external leverages of reverse innovation do enterprises (not) resort. Such research questions are best answered by the means of an explanatory case study i.e. "a case study whose purpose is to explain how or why some conditions come to be [, or] how or why some sequence of events occurred or did not occur", Yin (2014: 238). Case studies are particularly warranted in research on relatively novel and not well understood phenomena like reverse innovation (Eisenhardt, 1989b), as they e.g. facilitate theory building (Eisenhardt and Graebner, 2007). Furthermore, multiple case studies allow for cross-case comparison, enhance internal validity of results and make them more generalizable (Lewis-Beck et al., 2004). As research strategy, we therefore decide for a multiple case study. Since we are unconcerned with explaining why enterprises resort to external leverages otherwise, our level of analysis are reverse innovation endeavours in general, while the particular reverse innovation is the embedded unit of analysis (Yin, 2014: 31).

As technique to analyse empirical data collected, we decide for explanation building. Explanation building is *deductively-based*, narrative, and highly iterative (Lewis-Beck et al., 2004; Saunders et al., 2009; Yin, 2014); it starts from an initial explanatory proposition that may be inductively upgraded. Not only is a mix of deduction and induction within the same piece of research possible; in context of our study, it has been particularly advantageous (Saunders et al., 2009). On the one hand, it allowed for a rapid verification of resource endowment as the only explanatory variable. On the other hand, however, this research design remained flexible enough to absorb unanticipated patterns that emerged from data collected. Explanations beyond the initial one were repeatedly built and revised until a final explanation that matches all empirical data has been reached (Eisenhardt, 1989b; Eisenhardt and Graebner, 2007).

Expressed differently, we decided for explanation building as a compromise between analytic induction and pattern matching. Extant literature provided indications sufficient to build a possible initial explanation, but not sufficient to build a theoretically supported hypothesis required for pattern matching (Yin, 2014).

4.2. Pre-Sampling

The existence of an initial explanation notwithstanding, we select a research setting which facilitates the identification of causal paths that may have remained unobserved so far, for which "outlier cases may be especially valuable" ("heuristic case study"; Thomas, 2011: 515). This is particularly warranted given that the literature on reverse innovation "is basically still atheoretical and that there is significant space for developing this topic" (Cunha et al., 2014: 206). Therefore, we purposefully pre-select a population of enterprises that likely needed and possibly in fact relied on external leverages, thus helping to find the explanation we are looking for.

For three related reasons, the cases of enterprises to study were drawn from the population of Serbian SMEs. First, presently documented examples of reverse innovation (Table 18) mainly depict large, internally complex MNEs from most developed countries, which can usually draw on comparatively advantageous resource base. In contrast, we deliberately select SMEs as enterprises with assumed low internal (i.e. organisational) complexity and rather insufficient resources at hand, so the approaches to deal with environmental complexity by resorting to external leverages become more pronounced. Second, we generally pre-select enterprises from middle-income economies as these do not necessarily possess own technological assets to pursue reverse innovation, but nevertheless may still possess the capacity to insource and absorb cutting-edge technologies from a higher level of development. Note that Serbia is classified as an upper middle-income economy in transition (UNO, 2013; WBDI, 2015). Third, at the time when our research

project commenced, Serbia was the only middle-income economy in transition with publicly accessible data from the European enterprises' innovation survey (EIS, 2009). These data indicate that the share of Serbian SMEs that innovate is almost as high as in the EU (96% of the EU average). Nevertheless, Serbian SMEs achieve a comparatively low share of innovation in turnover (81% of the EU average; Eurostat, 2013; IUS, 2013), which may be attributable to the lack of capital for innovation diffusion. In fact, average domestic interest rates charged to Serbian SMEs were 16.3% in 2011, which includes a risk premium of 4% as compared to large enterprises. In the same year, only 77% of loans requested by SMEs were authorised. Additionally, given only EUR 13 million of venture capital investment in 2010, domestic equity financing is hardly available (all figures from OECD, 2013). These conditions being given, we assume that Serbian SMEs may generally be prone to engage in CVC with foreign partners, which we consider one of potential forms of external leverages.

4.3. Case Identification and Selection

After having pre-selected the population, we initially searched for appropriate cases via Internet and other public media. However, if not ending in a cul-de-sac altogether, these attempts led only to already well known cases of reverse innovation (Table 18). Given its novelty, reverse innovations seems to be only exceptionally labeled as such. We hence shifted to search via intermediaries, such as industry organisations, academic institutions, consultants and journalists based in Serbia. Almost a dozen of potential cases were reported this way, most of which eventually proved inappropriate as they were strictly seen cases of glocalisation, rather than of reverse innovation. In consequence, only four enterprises were shortlisted and sent an email request to participate in our study, along with a brief description of the research project. One of these enterprises,

a manufacturer of beauty care products, has not responded to our initial request and follow-ups. Eventually, three out of these four enterprises admitted to participate in the study:

Aero-East-Europe (AEE) developed an ultralight ambulance aircraft SILA 750-MT for the Economic Community of West African States (ECOWAS; Benin, Burkina Faso, Cape Verde, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo). Take-off and landing performance of this aircraft is extreme, as it needs less than 50m of runway on any solid and plain ground, e.g. on non-paved roads or grassland. This is relatively close to performance characteristics of ambulance helicopters, yet at a fraction (reportedly 10%) of purchase and operational cost. In contrast to SILA 750-MT, the firm's traditional product portfolio (SILA 450 and 950 series) has targeted domestic and the EU market.

Alternativna Energija designs and deploys solutions for storing and delivering solar energy, presently best suitable for combined power generation, water desalination, and air conditioning in the Middle East. The company employs a novel, self-developed technology that stores solar energy for up to 12 months with less than 5% of losses, thus practically overcoming the storage issue as the major challenge to the solar industry. The company is reportedly the only one that guarantees delivery of solar energy 24 hours a day, all year long. Given that Alternativna Energija is a start-up and did not have a prior traditional market for innovation, the company is comparably to GRIT in Judge et al. (2015) actually "born in reverse", as it had innovated for emerging markets from its very inception.

Simprolit had traditionally delivered construction services to South-East European and Russian market before it has developed and patented a concrete mixture for non-primary structures that is particularly appropriate for extreme climate conditions in Russia. Based on this concrete mixture, the firm has developed a system of construction elements (Simprolit®) that reportedly performs much better than usual solutions regarding thermo-insulation, humidity and frost resistance, non-

flammability, malleability, bio-resistance and economical application. For example, Simprolit® blocks insulate temperatures between -50°C and +50°C, and yield 0.15 m² of utilizable surface per length meter of the wall more than usual multi-layer walls of same performance.

Basic descriptive data on our case firms and their respective reverse innovation are provided in Table 19; the abbreviation “d.o.o.” stands for “društvo sa ograničenom odgovornošću”. A business entity of this type in Serbia is comparable to a private limited company (Ltd.) in the UK, or a “Gesellschaft mit beschränkter Haftung” (GmbH) in Germany.

	Aero-East-Europe (AEE)	Alternativna Energija	Simprolit
Enterprise type	d.o.o.	d.o.o.	d.o.o.
Established	2006	2009	2003
Headquarters	Kraljevo, Serbia	Kragujevac, Serbia	Belgrade, Serbia
Employees	~35/0 abroad	4/0	~25/50
Growth stage*	Early/accelerating growth	Start-up	Accelerating/sustaining growth
Reverse innovation	SILA 750 MT aircraft	Solar solutions 24/7	Simprolit® construction elements
Locus of development	Serbia	Serbia	Russia
Primary market	ECOWAS	Middle East	Russia
Entry mode**	Export (abandoned)	Presently unclear	FDI; licensing
Diffusion primary market	200 aircraft requested by “Médecins Sans Frontières”; Only two prototypes developed; Full delivery failed due to the lack of working capital	Ongoing negotiation about a multi-purpose project in Jordan	Own manufacturing in Russia; Several reference projects, e.g. Anadyr airport (Russian extreme North-East), terminal building of Domodedovo airport (Moscow), and apartment towers in Nizhnevartovsk (Siberia)
Diffusion secondary markets	Ongoing certification of the aircraft for the European Union	Project ideas to diffuse technology for residential teleheating purposes in Serbia	Own manufacturing in Serbia, several apartment towers built, mainly in Belgrade; Licensing to Bulgaria, Kazakhstan and Slovenia

Table 19: Descriptive data on the case firms and reverse innovations

*According to Metrick and Yasuda (2010); **According to Dunning (1979)

In line with some ongoing research (Winterhalter, 2015) and in contrast to what the literature on reverse innovation commonly suggests (e.g. Immelt et al., 2009; Govindarajan and Trimble, 2012), the selected cases imply that an enterprise – as AEE and Alternativna Energija – does not necessarily have to innovate *in* an emerging market if it wants to innovate *for* it, at least as long as it has knowledge about the market needs. The entry modes seem rather dependent on ownership, internalisation and location advantages (Dunning, 1979). For example, ECOWAS would not have provided location advantages to AEE. As usual in aircraft manufacturing so as to achieve the economy of scales (Aerospace Review, 2012), the company did not plan FDI, only export. Reverse innovation project has finally failed, but due to the lack of working capital rather than due to the intended entry mode. In any case, the light ambulance aircraft is presently being certified to target the niches of the market in the EU, for which AEE has traditionally innovated.

4.4. Data Collection and Analysis

Before the actual data collection, a preparatory phase took place from July to December 2013, with the primary purpose to make sure that the selected enterprises in fact engaged in reverse innovation, and to obtain their consent to participate in the study. The actual data collection took place from January 2014 to May 2015, by triangulation of semi-structured interviews, shop floor or plant visits with ad-hoc interviews, firm documentation, and external documentation analysis. Semi-structured interviews were executed in personal meetings during our visits to Serbia in January, May, August/September and November 2014, and via Skype and phone over the whole data collection period. Skype and phone interviews lasted roughly between 15 and 45 minutes, and personal meetings from one up to two hours. As a general framework to organise all interviews and keep track of those that stretched over a period of time, we followed a uniform questionnaire containing unstructured, open ended questions grouped along a schematic top-level process of

reverse innovation, which we developed by drawing on the phases of the simplifying linear model of innovation (concept; development; primary market diffusion; secondary market diffusion; Godin, 2006). This questionnaire was iteratively adapted following the insight that our respective explanation had not fully matched the empirical data collected.

Primary interview partners were the managing owners of the case enterprises (thereafter shortly referred to as “the managing owners”). In order to validate data from different perspectives, every managing owner was asked to name at least one additional interviewee knowledgeable about the respective reverse innovation. Interestingly, while all interviewees gladly disclosed any piece of information considered non-confidential, virtually all of them refused recording of interviews and appeared somewhat concerned about why we needed in written their authorisation to publish what they had stated and orally allowed being published anyway. Data collected during face-to-face meetings were hence typically documented in form of hand-written notes, the content of which was usually re-confirmed at the end of the respective meeting. The floor shop (AEE) and the showcase heating plant (Alternativna Energija) were visited directly following the respective interview on the spot, lasted roughly from 30 to 60 minutes, and contained ad-hoc questions directed towards the respective host and accidentally present staff members. Main purpose of these questions was to double-check some of data collected previously. Firm documentation that we analysed included firms' Web sites, explanatory YouTube videos, printed material, and approximately 2 GB of data in digital form all of which with documents of various content such as patent grants, certificates, project and product descriptions, brochures, reports, trade show presentations and publications. External documentation analysis largely relied on reports in local magazines and newspapers, TV documentaries about the respective firm and/or innovation, and publicly available data from the Serbian Business Registers Agency. Given that we applied the explanation building data analysis method, our initial explanation was followed by a series of iterations be-

tween data collected and respective explanation (Eisenhardt, 1989b; Eisenhardt and Graebner, 2007; Yin, 2014). More specifically, every iteration contained data analysis with case-by-case comparison of empirical evidence against respective explanation, explanation revision, collection of additional data, and so on until the final explanation has been derived.

5. Empirical Results

Our iterative building of the final explanation started with assessing the match between the initial explanation and the data collected and summarised in Table 20. Prior to data collection, we had no assumptions regarding whether the case firms resorted to external technology and/or market knowledge as external leverages of reverse innovation. In contrast, given adverse conditions for domestic debt finance in Serbia, we assumed that they have very likely needed foreign equity.

In fact, all case firms have resorted to some kind of external leverages. Alternativna Energija relied on equity from StorEnergy, an SME from the UK, to build a proof-of-concept heating plant in Badnjevac (Serbia) in 2011/2012. StorEnergy was able to obtain finance in the UK due to conditions more favorable than those in Serbia (OECD, 2013). Both firms have been attempting to commonly enter a CVC deal with a larger partner ever since. In the case of AEE, the knowledge of market needs and product environment in ECOWAS was external to the firm, as it was provided by "Médecins Sans Frontières", an NGO headquartered in Geneva, Switzerland. This constellation may be considered both, inter-organisational cooperation and a form of outside-in open innovation in which the market knowledge is external to the innovating firm. While SILA aircraft are generally powered by Rotax engines manufactured by the Austrian company BRP-Powertrain Management GmbH (owned by Bombardier Recreational Products), we consider this an arms-length market transaction rather than external leverage. Simprolit has developed its new concrete mixture by recombining and extending previous materials and technologies: Portland cement,

polystyrene (also known as Styropor or Styrofoam), Vidasil (a process for production of highly non-flammable heat insulation material) and own additives. The company has used both internal and external ways to the market, as it also licences its trademark. The innovation process by Simprolit has hence clear features of outside-in and inside-out open innovation.

	Aero-East-Europe (AEE)	Alternativna Energija	Simprolit
	SILA 750 MT aircraft	Solar solutions 24/7	Simprolit® constr. elements
Content			
Market knowledge	Knowledge about product environment in ECOWAS provided by “Médecins Sans Frontières”, an NGO	Need for storing solar energy global, so no particular knowledge of emerging markets required	Own market knowledge through involvement in previous construction projects in Russia
Technology	Arms-length: SILA series powered by Rotax engines (manufactured by BRP-Powertrain Management GmbH, an Austrian enterprise)	Own technology developed	<ul style="list-style-type: none"> • Insourcing: Portland cement, polystyrene, vidadil • Outsourcing: Licensing of Simprolit construction elements to Bulgaria, Kazakhstan and Slovenia
Equity finance	None	Proof-of-concept heating plant in Badnjevac (Serbia) co-financed by a British SME (StorEnergy)	Previously joint ventures with various partners, presently none
Form of external leverage	Hybrid of inter-organisational partnership and outside-in open innovation	Inter-firm partnership	Open innovation (both outside-in and inside-out); formerly CVC
Purpose of external leverage	Product development	Business model development	Product development and diffusion

Table 20: External leverages of reverse innovation employed by the case firms

However, empirical data on equity finance contradict the initial explanation and other pieces of information collected. Most notably, the diffusion of AEE’s SILA 750 MT ambulance aircraft to ECOWAS failed due to the lack of working capital (Table 19), but the firm has not accessed external equity whatsoever (Table 20). Showcase plant by Alternativna Energija was completed in

early 2012, but more than two years later, no follow-up CVC deal to diffuse solar solutions was entered or pending. Simprolit does not rely on equity finance anymore.

Consequently, we firstly assumed that the lack of debt finance in Serbia reported by OECD (2013) may exceptionally not have applied to case firms, given arguable business potential of their reverse innovations. Alternatively or additionally, they might have been unnoticed or disregarded by foreign corporate venture capitalist. We hence focused our data collection on both forms of finance, debt and equity, even though we have considered debt not an external leverage. The date turned even more contradictory (Table 21).

	Aero-East-Europe (AEE)	Alternativna Energija	Simprolit
	SILA 750 MT aircraft	Solar solutions 24/7	Simprolit® constr. elements
Debt finance	Bank guarantees for advance payment by "Médecins Sans Frontières" initially requested and authorised but eventually not withdrawn due to too high interest rates	<ul style="list-style-type: none"> • Requesting bank loans considered futile due too small firm size, high amounts needed and investment taking place abroad • Financing initially considered not an issue due to assumed availability of foreign equity finance 	<ul style="list-style-type: none"> • Bank loans not requested in Serbia since prospects of authorisation for investment in Russia considered negligible • Initially not eligible for bank loans in Russia
Equity finance	Joint venture with an unspecified CVC partner from abroad considered but refrained from	<ul style="list-style-type: none"> • Several foreign investors were interested in CVC deals • Joint venture with an undisclosed CVC partner from the UK failed during the due-diligence • Currently preparing for due-diligence with another potential partner from Jordan 	Several CVC based joint ventures with partners from Cyprus, Russia, Serbia and Switzerland established but rapidly dissolved; exclusive intellectual property rights re-acquired

Table 21: External debt and equity finance considered by the case firms

AEE heavily suffered from lack of affordable debt finance⁹:

"In Serbia, the interest rates are so high that they eventually reach 25 percent. [...] For a serious production cycle we need at least half a million of Euros, but the banks ask for guarantees that it is impossible to provide. Well, I would even not ask for loans if I had as much real estate as they require. In addition, mortgage loans can be issued only on registered property. Almost 95 percent of real estate in Serbia is not registered, but the bankers behave as if they have not heard of that.

⁹ Please see appendix for the list of cited secondary sources.

When I ask them whether planes may serve as a guarantee, because at any moment I have at least ten planes in manufacturing process, they shake their heads: 'What would we do with your planes, they are not beer so they could be sold if something goes wrong?' Interest rates in Serbia are loansharking and mortgage conditions pure insolence." (Milorad, Sloboda)

"At trade fairs, [potential foreign] customers are delighted with the quality and price of our aircraft. But when they hear that we are from Serbia, they immediately ask: 'Wasn't that about wars, Kosovo?' They are afraid for their money. When I answer that Serbia is a state with a legal system and courts, they say: 'Yes, but your state is a Banana republic. We don't want to take any chances. We'll give you 3,000 Euros [i.e. 5-10%] more per plane, but only after you have delivered'. Yet the production of such an expensive product needs finance, so there we go." (Milorad, interview)

"Struggling with prejudices about the quality of products from Serbia, Aero-East-Europe has difficulties financing its production since very few buyers opt for advance payments." (eKapija Business Portal)

In case of SILA 750 MT for ECOWAS, Médecins Sans Frontières were even willing to make advance payment so as to supply working capital, provided AEE ensures bank guarantees. Since the firm was offered guarantees at interest rates far above 15%, it finally cancelled the project.

Simprolit even did not attempt to obtain loans; in post-war Serbia of early 2000s, requesting loans from local banks for investments in Russia was considered futile. At the same time, the firm was not eligible to access debt finance in Russia as it was not a Russian business entity at that time. Alternativna Energija equally refrained from requesting bank loans altogether. Envisioned solar plants are capital intensive and reportedly require hundreds of EUR million. Due to its small size and lack of guarantees, the firm considered obtaining loans of such a magnitude not realistic, particularly not for projects abroad. Instead, short after completion of the showcase plant in 2012, the managing owner was positive about prospects to attract foreign equity finance:

"Finance is not the problem here. For this technology money will not be a problem, it will be possible to obtain it from abroad." (Vladan, RTS)

"We've got many business delegations from around the world here, a huge interest. We're now completing a feasibility study for the Government of Jordan, for a power plant of 1 Megawatt; what's coming up next are 50 and then 500 Megawatt." (Vladan, TV Kragujevac)

Though no CVC deal has been entered or pending since, Alternativna Energija reported on negotiations with potential investors from 19 countries, e.g. from Bulgaria, China, Germany, India, Italy, Jordan, Norway, Spain, and the UK. Simprolit entered equity based deals with partners from Cyprus, Russia, Serbia and Switzerland, and formed joint ventures, but dissolved them rapidly without achieving any significant leverage effect.

Concomitantly, AEE heavily and Alternativna Energija more decently criticised the government for not supporting innovative start-ups:

"Let me tell you, this is not a criticism, I do not want to criticize anyone, but everybody in Serbia contacted us, reacted, except for the state administration. Unfortunately." (Vladan, RTS)

"As I was about to start manufacturing planes, they [i.e. the government] did not have confidence in our project. But we have delivered on promise; we hired 30-40 people. [...] If everything goes well, in next two-three years we will employ another 100-150. Of course, we need help in accessing finance for working capital and setting-up another plant near the airport in Kraljevo, but vending of our products is certain." (Milorad, eKapija Business Portal)

"My planes are as good as Cessnas, but they cost a quarter of the price. Yet they [government officials] prefer [approving payments of] \$5 million [from public budget] if they can divert two into their own pockets." (Milorad, interview)

According to them, the government should play a more pronounced role in innovation diffusion, directly or indirectly, the latter e.g. via contributing to improved product/enterprise reputation:

"What is important here is the willingness of the government to support implementation of our technology in Serbia." (Vladan, interview)

"Here, let's take [as an example the city of] Kragujevac, 50,000 dwellings. If you want to heat 50,000 dwellings, 6 months, you need [...] investment of some, what I know, 150-200 million Euros. Now, the price of gas for 20 years is 850 million Euros." (Vladan, RTS)

"I deliver 'Made in Serbia', not 'Made in the USA'. But why would my customers buy 'Made in Serbia' if my government does not? Yet they very well could, for [pilots'] training, agricultural purposes, combating mosquitoes and illegal hunting." (Milorad, interview)

Contrary to our intermediate assumptions, the firms suffered from factual inaccessibility of debt finance and – in case of Alternativna Energija rather perceived – lack of governmental support. Finally, delivery of teleheating for residential purposes is in Serbia the core business of independent economic entities, rather than of the government. Though the firms were well visible to

foreign investors, they were generally (AEE) or selectively (Alternativna Energija) reluctant to access external equity, or to sustain it (Simplolit). If maximising (diffusion) performance had been the purpose of external leverages, with factual or perceived resource endowment as the only factor explaining which leverages are specifically resorted to, then the firms should actually have pursued equity finance as only remaining option. Instead, AEE prefers growing slowly and organically:

"We have been able [...] to respond with our products to the most restrictive requirements [i.e. to obtain German aviation certificates], so our products are already in Europe. [...] Now we take a journey around the world. That journey is not a race but simply a manifesto about our products." (Milorad, TV Pink)

Simplolit has been consolidating ownership with a preference for inside-out open innovation:

"I decided to get out of all joint ventures [...], some [JV partners] I have paid out, with some I'm still in unresolved ownership division, but I've kept only companies in which I have over 90% of ownership. [...] Instead of joint companies, now I engage in licencing." (Milan, interview)

As we were unable to identify factual benefits of strategic decisions against external equity to the respective firm or reverse innovation, we assume individual determinants (Crossan and Apaydin, 2010; Hambrick and Mason, 1984) as a potentially explanatory factor, and focus on the managing owners' individual motives and perceptions. Given that the case firms are SMEs with a great deal of managerial discretion, the characteristics of the respective managing owner should have become reflected in strategic decisions made (Finkelstein and Hambrick, 1990; Hambrick and Finkelstein, 1987). Subsequently collected primary and secondary data indicate that the managing owners have been driven by a mixture of idealism, passion, and perceived mission.

Milorad:

"I always wanted to fly and to construct my planes myself." (Milorad, interview)

"I was born, I think, with this desire to fly, but that privilege was reserved [for the others]. I had not even money for a membership in the aero-club, but the desire has never cooled down. When I was seven or eight years old, a police helicopter landed at the local [soccer] stadium. Somehow, I passed unnoticed through the security and entered the cabin. Utter bliss!" (Milorad, Sloboda)

Vladan:

"I was a naïve idealist as I returned to Serbia [short before Yugoslav secession wars]." (Vladan, interview)

"Vladan [...] used to work for many years in Germany, and there he achieved remarkable business results. What has made him return to Serbia was not a favorable financial environment [...] but the love for his country. And his wish to do something revolutionary for it: to make it the first country to have the technology storing high-quality [solar] energy for a long period of time." (RTS)

"I think with this it would be very important to rapidly make in Serbia at least, say... to enter the world market and, say, that Serbia has a monopoly on this technology. That would be awesome. I think the whole world is going to use this. [...] The world doesn't need nuclear power anymore." (Vladan, RTS)

Milan:

"My mission is an ecologically sustainable civil engineering." (Milan, interview)

"[...] there is the fact that the durability of polystyrene is 10-12 years, mineral wool 14-16 years, aerated concrete 17-18 years, brick 40 years and Simprolit is the most durable [...] as it does not change its basic features for over 50 years. [...] About which ecological building and energy conservation we can talk, if after 15 years, I should re-build a house, or re-insulate it?" (Milan, RTS)

With this regard, all managing owners in unison expressed a personal dissatisfaction with their

CVC experiences:

"Take eighty percent of the profit, I don't care, but leave me eighty percent of my innovation." (Milorad, interview)

Asked later on whether he remembers this statement and, if so, to comment on it, he added:

"Of course I do remember, but it's a complicated sentence... I don't care about profits. The important thing is to make an effort, even mistakes, but also to advance, to gather experience and to realize innovation." (Milorad, interview)

Commenting on why Alternativna Energija relied on equity from StorEnergy, but not from other

interested investors, the managing owner stated:

"They [i.e. StorEnergy] are different; they do not want to take advantage of us, but seek to commonly realize innovation. They have delivered on all promises they had made." (Vladan, interview)

"Many foreign delegations have been here, and all of them are interested, and make promises, but [when it comes to deliver on promise] then they impose conditions... They talk only about eighty-twenty [JV ownership]. Whatever ownership, I want to be the sole innovator." (Vladan, interview)

The managing owner of Simprolit had issues with lack of appreciation and attempted fraud:

"When I show them my Russian certificates, they assume I bribed to obtain them." (Milan, interview)

"I accidentally discovered that the loans were common, but that all the property was registered on one of the partners. I got out of the joint venture in Switzerland, and my stakes I have sold to them for one Euro, provided that they take out Simprolit from the joint venture's name." (Milan, interview).

From these statements, we infer that the managing owners have perceived themselves primarily as innovators: "I want to be *the sole innovator*" (Vladan), "*my innovation*" (Milorad) and "*my [...] certificates*" (Milan). In case of the latter, insinuation of bribing and attempted expropriation imply anything else but appreciating Milan as an innovator. Rather than depending on factual or perceived impacts on innovation performance, the managing owners seem to have resorted to external equity depending upon (anticipated) impacts on their self-concept. These are unexpected results, which the following section shall frame from a theoretical perspective. Subsequently, we briefly discuss alternative explanations considered and rejected during the iteration process.

6. Final Explanation

Broadly defined, the *self-concept* is a person's perception of the self; it is a multi-faced, hierarchical construct (Baumeister, 1997; Shavelson and Bolus, 1982). More specifically, Lall and Sharma (2009: 25) define the self-concept as "the accumulation of knowledge about the self, such as beliefs regarding personality traits, physical characteristics, abilities, values, goals, and roles". A person's self-concept is organised around discrete cognitive generalisations, called *self-schemata*, which incorporate a particular trait, value, goal or role, and the person's experience on this domain (Crisp and Turner, 2010). In case of the managing owners involved in our study, some of self-schemas seem to be e.g. "I am an innovator", "I want to construct planes", or "My goal is an ecologically sustainable civil engineering ". Note that the self-concept and subordinate

self-schemata are descriptive (e.g. "I am an innovator"), while *self-esteem* is evaluative, opinionated self-appraisal of the particular aspect of the self as intrinsically positive (e.g. "I am proud of being an innovator; Baumeister, 1997; Crisp and Turner, 2010).

To any person, some of own self-schemata are more and some less important, while some may be not important at all (ibid). However, if a particular aspect of the self is perceived as extremely important, the person in question is considered self-schematic regarding that aspect (Markus, 1977). Put differently, traits of extreme importance to the self-concept can be characterised as *self-schematic traits*. While the managing owners of our case firms are doubtlessly both, innovators and businessmen, they seem to be more self-schematic on the former trait ("Take eighty percent of the profit, I don't care, but leave me eighty percent of my innovation").

Several theories of *self-concept maintenance* propose that a person's behaviour is dependent on how this person defines the self in comparison to a particular point of reference (Crisp and Turner, 2010). This point of reference may be the perception of how the self *should* be (Carver and Scheier, 1981; Higgins, 1987), other individuals (Festinger, 1954; Tesser, 1988), or a particular social group to which the person in question belongs (Hogg and Abrams, 1988; Turner et al., 1987). A recent experiment by Mazar et al. (2008) indicates that people facing a motivational dilemma behave in a way which balances motivational forces by maintaining self-schematic traits. For example, humans will engage in a monetary advantageous (in the experiment: dishonest) behavior only inasmuch as the particular self-schematic trait (in the experiment: of being honest) remains unaffected. While resorting to external equity is anything but dishonest, the managing owners of our case firms seem to analogously have made strategic choices that balance (potential gains from) resorting to external equity and self-schematic traits in favour of the latter.

When it comes to innovation management in general, the role of leadership has been widely recognised (cf. the special issue of *The Leadership Quarterly*, 2004, Volume 15, Issue 1, summa-

rised by Mumford and Licuanan, 2004). As an integrating perspective towards individual determinants of innovation, Crossan and Apaydin (2010) propose applying the upper echelon theory (Hambrick and Mason, 1984). Drawing on the premise of bounded rationality that complex and uncertain situations are not "objectively knowable", the upper echelon theory essentially proposes that "(1) executives act on the basis of their personalized interpretations of the strategic situations they face, and (2) these personalized construals are a function of the executives' experiences, values, and personalities" (Hambrick, 2007: 334). The upper echelon approach used to largely focus on how strategic decisions are affected by executives' perceptions and interpretations of the *environment*, rather than of the self, since "a theoretically grounded, validated construct for conducting systematic inquires" about impacts of executives' self-concepts had been lacking for long (Hiller and Hambrick, 2005: 297, 303). Consequently, the same source proposes to adapt the construct of *core self-evaluation* (Judge et al., 1997), which is essentially akin to self-concept (Judge et al., 1998, 1999; Hiller and Hambrick, 2005) but more integrative, validated, and measurable (Bono and Judge, 2003; Judge et al., 2003)¹⁰. Core self-evaluation is defined as "fundamental premises that individuals hold about themselves and their functioning in the world" (Judge et al., 1998: 168). As a second-order construct, core self-evaluation is the common kernel (Hiller and Hambrick, 2005) of first-order traits self-esteem, emotional stability, generalised self-efficacy ("a general estimate of one's ability to perform and cope successfully within an extensive range of situations"), and locus of control (one's belief in own "capacity to impact the environment and produce desired effects"; Johnson et al., 2008: 393). Additionally, core self-evaluation explains the correlation between these four first-order traits (e.g. 85% between self-esteem and generalised self-efficacy; Judge et al., 2002).

¹⁰ For the sake of simplicity, we hence use both terms as approximate synonyms, though we are aware of remaining differences (e.g. self-concept is descriptive while core self-evaluation and its first-order traits are evaluative).

In this vein, self-esteem of managing owners involved in our study seems to largely correlate with generalised self-efficacy ("I decided to get out of all joint ventures") and emotional stability ("Now we take a journey around the world. That journey is not a race but simply a manifesto about our products"). Empirical data on the perceived locus of control are rather ambiguous, however; on the one hand, some statements may indicate the belief in internal locus of control ("We have been able [...] to respond with our products to the most restrictive requirements"; "For this technology money will not be a problem"). On the other hand, the criticism of the local government indicates the perception of the locus of control as rather external ("everybody in Serbia contacted us, reacted, except for the state administration"; "why would my customers buy 'Made in Serbia' if my government does not?"). External equity seems to induce a fear of the locus of control shifting further outwards ("I accidentally discovered that the loans were common, but that all the property was registered on one of the partners"; "I've kept only companies in which I have over 90% of ownership"; "then they impose conditions"), which would in turn negatively affect the self-esteem ("leave me eighty percent of my innovation"; "I want to be the sole innovator").

So it is finally the correlation of locus of control and self-esteem within the core self-evaluation that explains the fact that the case firms have refrained or withdrawn from external equity deals.

The theory of core self-evaluation was initially applied to predict job-satisfaction, motivation and performance (e.g. Erez and Judge, 2001; Ferris et al., 2013; Judge et al., 1997, 1998; Kacmar et al., 2009). However, Hiller and Hambrick (2005) elaborated on the impacts of an extraordinarily high level of core self-evaluation on strategic decision-making, and suggested the suitability of the core self-evaluation for studies on other organisational contexts. Following this suggestion, a whole stream of research has been emerging. For example, core self-evaluation has been applied in studies on groups' creativity (Bechtoldt et al., 2012), fit between incentives and firm performance (Chng et al., 2012), transformational leadership (Hu et al., 2012), hybrid entrepreneurship

(Raffiee and Feng, 2014), firms' entrepreneurial orientation (Simsek et al., 2010) and dynamic capabilities (von den Driesch et al., 2015). A good deal of these studies focuses on liabilities of having too low core self-evaluation (e.g. Erez and Judge, 2001; Judge et al., 1998), extraordinarily high level of core self-evaluation (Hiller and Hambrick, 2005), or on core self-evaluation as an independent variable predicting depending ones such as a group's creativity or a firms' entrepreneurial orientation (Bechtoldt et al., 2012; Simsek et al., 2010). In contrast, our final explanation does not assume any particular level of core self-evaluation; finally, this is in line with Heather-ton and Weinberger (1994), according to whom a person's core self-evaluation should be formed by early adulthood, though life experience may add some further influences. In sum, we answer our research question as follows: *Provided a factual or perceived self-insufficiency, enterprises would consider resorting to external leverage of reverse innovation of any content, form or purpose. However, at any given level of involved decision makers' core self-evaluation, the decision whether the potential external leverages will in fact be resorted to, and if so to which extent, will be made in a way that maintains the decision makers' core self-evaluation. Possible motivational conflicts will be made in favour of decision makers' (more) self-schematic traits.*

7. Discussion

7.1. Alternative Explanations

Prima facie, the agency theory (Eisenhardt, 1989a; Jensen and Meckling, 1976) may appear as an alternative explanatory base to the proposed final explanation. In fact, the managing owners of our case firms can be considered agents with high discretionary power, while agents are supposedly driven by cost-benefit considerations aiming at own utility maximisation. The case firms might hence have resorted to some external leverages of reverse innovation and refrained from the others because the managing owners have possibly maximised their individual utility rather

than innovation performance. Finally, given that our case firms are private business entities, we have been provided hardly any pecuniary information, let alone data about factual and forfeited income of the managing owners. In addition, the managing owners' utility function could be understood as inclusive of some variables representing their core self-evaluation. While such claims can hardly be proven ultimately right or wrong, Mazar et al. (2008) make an impressive point for conceptualising agents' (pecuniary) utility as subordinate to their self-concept maintenance, rather than vice versa. Put differently, our study has admittedly not considered all possible dimensions of the managing owners' utility maximisation. However, extant research indicates that the unknown content of their utility black-box is subordinate to their self-concept maintenance, and hence unlikely an explanatory alternative.

Given that external equity and CVC are not common in Serbia (OECD, 2013), another alternative assumption could be made that the case firms were simply not well informed with this regard. In turn, this would favour bounded rationality perspective and upper echelon theory (Hambrick and Mason, 1984; Hambrick, 2007) as the sole explanatory approach. However, we argue that this can be ruled out as exactly the intellectual "fathers" of the upper echelon theory propose adding the core self-evaluation to explain enterprises' strategic choices (Hiller and Hambrick, 2005).

Neo-institutionalism (Scott, 1995) is complementary rather than contradictory to our explanation. From this perspective, a significant institutional distance along the cognitive dimension has likely existed between our case firms and potential foreign investors. That is, the managing owners and potential foreign investors have had cognitively different representations of Serbian "institutional voids" (Khanna and Palepu, 1997) in the market for external finance. To the former, these institutional voids may have left no chance but to establish a more robust self-concept as innovators, in which profits plays a subordinate role ("I don't care about profits"). For the latter, the same institutional voids may have represented primarily an opportunity for (mutual) profits. Foreign inves-

tors have hence apparently failed to conform to local cognitive institutions, so this lack of cognitive isomorphism prevented them from earning legitimacy and entering deals with the case firms (Xu and Shenker, 2002). Note that this complementarity is in line with the concept of self-construals ("how individuals see the self *in relation to others*"; Cross et al., 2011: 143, italic added), which are culturally determined (Markus and Kitayama, 1991).

From the epistemic point of view, the theoretical framework for our final explanation may possibly appear hardly falsifiable. While a simultaneous proof of falsifiability would render the making of any theoretical proposition obsolete, we argue that the falsifiability of our final explanation is conclusively decidable: to verify and to falsify it is both logically possible (Popper, 2002). As core self-evaluation is measurable (Judge et al., 2003), the criterion necessary and sufficient for falsifying would be to identify at least one enterprise which resorting to external leverages of reverse innovation diminished the core self-evaluation of involved decision makers.

7.2. Implications

Applied back to the fact that all MNEs in documented cases of reverse innovation (Table 18) refrained from external leverages, our final explanation implies few possible lines of argument. Since prior literature on reverse innovation in unison postulates that foreign MNEs lack knowledge of emerging markets and need novel or recombined technology, our favorite line of argument would be that executives of these MNEs either (erroneously) perceived self-sufficiency, or refrained from external leverages because that would have negatively affected their core self-evaluation (as innovators for emerging markets). Linking to the post-colonial corporate mindset (Prahalad and Lieberthal, 1998), this would in turn imply that these MNEs may have had overcome the dominant innovation logic regarding the primary market for innovation, but not the managerial self-perception as supposedly superior, self-sufficient lone innovator. On

the methodological level, however, these reflections obviously raise the question of generalisability of our findings. We discuss this aspect in the following subsection.

7.3. Validity and Reliability

The literature on qualitative methods agrees that a particular number of cases do not necessarily equal to the validity and/or reliability of the study in question. Eisenhardt (1989b) suggests selecting four to ten cases, while Yin (2014) discusses rationales that favour single-case design over multiple-case design, or vice versa. Siggelkow (2007) argues that even a unique case may very well be worth being studied. According to Alvesson and Kärreman (2011), however, the quality and richness of empirical data are more important aspects than the mere number of cases. In a similar vein, the research project presented in this paper did not start with any particular decision regarding the number of cases to study. Instead, we drew on Thomas (2011) and purposefully defined the criteria for inclusion of cases. All cases identified this way have been included, so there has been arguably no selection bias on our part (however, note that one of identified enterprise has not responded to our request to participate in the study). Our cases are highly heterogeneous regarding industry and geographic location of primary market for innovation, which additionally reduces the possibility of obtaining biased results.

Construct validity: The construct validity of reverse innovation at the aggregate level of the research stream may reasonably be challenged, as different sources use different conceptual nuances. However, the present study consistently draws on a single, robust concept that was recently proposed by Radojevic (2015). In addition, external leverages have been defined prior to data collection as a meta-construct that unifies single constructs validated by extant literature, such as open innovation, inter-firm cooperation, and corporate venture capital. The validity and measurability of the key explanatory construct, core self-evaluation, has been verified by various pieces

of prior research (e.g. Bono and Judge, 2003; Judge et al., 2003). Finally, as a tactic to ensure construct validity by research design, our data collection was performed over a period of time, by triangulation of multiple sources of evidence (Yin, 2014: 45).

In order to increase *internal validity*, we have iteratively revised our explanatory attempts until the final explanation matched all empirical data (Eisenhardt, 1989b; Eisenhardt and Graebner, 2007). Additionally, we have addressed all rival explanations that we either considered and refused, or could think of (Yin, 2014). On a more general note, our multiple-case design allows for cross-case comparison and enhances internal validity of results (Lewis-Beck et al., 2004). Nevertheless, causality of relationships and correctness of inferences are major challenges to explanatory case studies in general (Yin, 2014), and are potentially exposed to criticism when it comes to our study in particular. Finally and in line with bounded rationality perspective on which we indirectly draw, researchers cannot objectively know about the (in)existence of further – not observed or not observable – explanatory alternatives.

External validity: Three factors reduce the generalisability of our results. First, the concept of the self involves self-construals, that is, the others as the point of reference (Crisp and Turner, 2010; Cross et al., 2011). However, the importance of this comparison is culturally dependent (Markus and Kitayama, 1991), i.e. persons from collectivistic cultures (Asia, Africa, parts of Central and South America) define the self significantly more in comparison to the others than persons from individualistic cultures do (Europe and North America; Cross et al., 2011). In turn, that implies that our results may or may not apply to decision makers from collectivistic cultures. Second, while the upper echelon perspective applies to both, individual executives and top management teams, a focus on the characteristics of the latter will yield stronger explanations than a focus on the characteristics of the former (Hambrick, 2007) – at least as long as there is a top management team at all. The existence of a top management team provided, an individual's core self-

evaluation may additionally depend on group-level perceptions (Tasa et al., 2011). Therefore, our explanation may or may not be generalizable to firms in which top-level strategic decisions are made by a team rather than an individual. Third, the upper echelon perspective generally acknowledges that strategic choices will the more reflect the individual characteristics of a decision maker, or decision makers, the higher is the managerial discretionary power (Finkelstein and Hambrick, 1990). The environment to our study involves single managing owners with very high discretionary power. Consequently, in environments with less managerial discretion, managerial core self-evaluation will yield weaker explanation of decisions made with regard to external leverages of innovation. That being said, our results are well supported by prior theory, so we argue that the final explanation is at least generalizable to similar environments: to *any* innovation by *any* firm with a single or dominant decision maker from an individualistic culture.

Reliability: The cross-source consistency of empirical data collected from primary and those from secondary sources has been extremely high. Additionally, empirical data obtained from older newspaper reports and TV documentaries have been highly consistent with more current data, irrespectively of whether primary or secondary. Consequently, subject error and subject bias as common threats to reliability (Robson, 2002) hardly apply to the present study. In order to eliminate observer error and observer bias as remaining threats to reliability, we followed a uniform questionnaire containing unstructured, open ended questions grouped along a schematic top-level process of reverse innovation, and documented our project results from various aspects that taken together correspond to the case study protocol proposed by Yin (2014). *In sum, we argue that our findings are reliable, though their generalisability is partly uncertain.*

8. Conclusion

In the present study, we have elaborated on why firms do (not) resort to external leverages of reverse innovation, and if they do, to which leverages specifically. This is an important question because it links two streams of innovation research that were largely segregated until now: external sources of innovation (West and Bogers, 2014) including corporate venture capital (Chesbrough, 2002), and emerging markets as the new context of innovation (Vives et al., 2010). By answering this research question, our paper makes three major contributions. First, it identifies the impacts of managerial core self-evaluation on strategic decisions regarding the innovation process. While it has been well known that the collective managerial logic (Prahalad and Bettis, 1986) may inhibit reverse innovation in large MNEs altogether (Immelt et al., 2009; Govindarajan, 2012), this paper reveals that executives' intrinsic tendency to maintain the self-concept may prevent *any* enterprise from (optimally) resorting to external leverages of (reverse) innovation.

Second, our study enriches the empirical base by adding cases of reverse innovation for emerging markets in Middle East, West Africa, and Russia, which have been understudied so far (Subramaniam et al., 2015). In similar vein, we study small enterprises from a middle-income economy that have been largely disregarded in prior literature, and hence fuel the discussion on comparative position of different players (Burger-Helmchen et al., 2013). These enterprises may very well develop or recombine cutting-edge technologies for specific needs of emerging markets. Counter-intuitively, however, it is not primarily the absence of opportunities to resort to external finance that hampers the innovation diffusion (Knight and Cavusgil, 2004; OECD, 2013) – it is foremost the potential impact of external leverages on managers' core self-evaluation.

Third, our findings generally contribute to the literature stream on cognitive aspects in innovation management and strategic management. The upper echelon theory (Hambrick and Mason, 1984) used to be employed in research on how executives' personalized interpretations of the *environ-*

ment impact strategic choices made by enterprises. Similarly, the core self-evaluation theory (Judge et al., 1997) was initially applied to predict job-satisfaction, motivation and performance. Later on, Hiller and Hambrick (2005) proposed forming a theoretical framework from these two theories so as to study impacts of executives' self-concept on strategic choices made by enterprises, which has induced a whole stream of recent research. The present paper proposes extending this theoretical framework further to include theories of self-concept maintenance (in our case Carver and Scheier, 1981; Higgins, 1987; Mazar et al., 2008).

These contributions notwithstanding, our paper is subject to some restrictions, which largely translate into future research opportunities. First, our results appear so far generalizable solely to environments similar to the one of our study, with a single or dominant decision maker from an individualistic culture. Consequently, with regard to the theories of self-concept maintenance, we have drawn exclusively on the theories of self-comparison (Carver and Scheier, 1981; Higgins, 1987). Studies focusing on management teams or managers from collectivistic cultures would need to consider either or both, self-concept maintenance theories of inter-individual (Festinger, 1954; Tesser, 1988) and group comparison (Hogg and Abrams, 1988; Turner et al., 1987).

Second, since all our case firms are privately owned enterprises, we were provided virtually no pecuniary information about the performance of the respective innovation, or of the firm as a whole. Our triangulation proved hardly helpful with this regard for the same reason. In fact, however, our case firms traded off a large-scale diffusion for retaining exclusive ownership of the respective reverse innovation. In the short run, this approach obviously inhibited mass diffusion and rapid growth, but only a longitudinal study could reveal whether and how our case firms will be able to monetize on exclusively retained reverse innovations as a potential source of comparative advantage in the long run. More generally, this calls for further studies on combined impacts of (reverse) innovation and managerial self-concept (maintenance) on business performance. So

far, extant literature has e.g. conceptually proposed that a greater executives' core self-evaluation would result in a higher volatility of business performance (Hiller and Hambrick, 2005), or empirically proved that a higher core self-evaluation induces a higher firms' entrepreneurial orientation (Simsek et al., 2010). However, although core self-evaluations are anticipated to be normally distributed over the population of executives (Hiller and Hambrick, 2005: 308), the core self-evaluation of an individual executive will remain rather stable from early adulthood on (Heather-ton and Weinberger, 1994). Consequently, we can envision exciting studies on distribution of business/innovation performance along the distribution of core self-evaluation among executives, and about whether there is an "optimal" level of executive's core self-evaluation from this perspective.

Finally, we have considered but ruled out agency theory (Jensen and Meckling, 1976) as the appropriate perspective towards (not) resorting to external leverages at the level of a single reverse innovation. Yet we indirectly call for researching precisely these issues at another level, i.e. at the level of a publicly owned MNE. More specifically, our study implies that executives' decisions regarding external leverages (of reverse innovation) may primarily aim at their self-concept maintenance, but this may or may not be beneficial to the shareholders; the research community interested in corporate governance might wish to elaborate on this theme.

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GENERAL CONCLUSION

This doctoral thesis contributes to the understanding of reverse innovation at different levels of analysis: country, enterprise, and innovation process. At the *country level*, the thesis follows the suggestion by Meyer (2004: 273), goes beyond FDI-related technology spillovers, and analyses social impacts of reverse innovation on the poorest socio-economic group in India. Targeting this market segment generally entails innovating in order to address market needs and conditions *extremely* different from those in developed countries (Govindarajan and Trimble, 2012). In doing so, foreign enterprises, particularly Western MNEs, may or may not find the purported fortune (Prahalad, 2005). However, in line with Karnani (2007) and despite recent claims to the contrary (Govindarajan and Trimble, 2012: 192), reverse innovation is *not per se* "an instrument for solving some of the world's most vexing social problems". Some social impacts of reverse innovation on the poorest socio-economic group in India are positive, e.g. improving the access to healthcare, reduction of inequality among genders, or creation of opportunities to participate in consumption. At least so far, however, reverse innovation has not resulted in large scale prosperity and poverty reduction. Therefore, reverse innovation is a result of (Cozzens and Kaplinsky, 2009) rather than the cure for extreme poverty and inequality.

Although reverse innovation has been frequently conceptualised relatively to the geo-economic environment (e.g. by Govindarajan and Ramamurti, 2011), as the flow of innovations from less to more developed countries supposedly contradicting the international product life cycle (Vernon, 1966), it is in fact a phenomenon at the *organisational level*. Reverse innovation means that a new product or service is developed for a formerly secondary market abroad, in contradiction to the dominant innovation logic of *any* firm in question, and diffused from there back to the for-

merly primary market rather than vice versa. Clearly, reverse innovation is stimulated by business potentials of formerly secondary markets, and it essentially means that primary and secondary market for an enterprise's innovations switch their roles. However, these business potentials may and frequently do but do not necessarily have to result (only) from changing geo-economic environment, as "emerging markets" also need to be understood from the specific perspective of the firm in question, rather than from the general perspective of influential financial intermediaries.

As any organisational innovation, reverse innovation is a multi-dimensional phenomenon (Crosan and Apaydin, 2010). Therefore, various aspects of inversion mentioned in extant literature are not mutually exclusive and may be in fact supportive of reverse innovation. However, they are neither necessary nor sufficient for its conceptualization, irrespectively of whether diverting innovation flows (from less to more developed countries; Govindarajan and Trimble, 2011), inversion within the innovation process (Borini et al., 2014; Laperche and Lefebvre, 2012; von Zedtwitz et al., 2015), reversal of knowledge spillovers (from local firms to foreign MNEs in emerging markets; Li et al., 2013), or switch of the roles between headquarters and subsidiaries/suppliers (Baglieri et al., 2014; Borini et al., 2012; Sartor and Beamish, 2014).

Reverse innovation poses extreme challenges, since the enterprise in question needs to overcome exogenous (institutional, geographic, economic; Ghemawat, 2001; 2007; Xu and Shenkar, 2002) and endogenous (market knowledge, technology, business model; Leonard-Barton, 1992; Prahalad, 2005; Teece, 2010) distances to the new primary market. Additionally, enterprises pursuing both reverse innovation and glocalisation as proposed by Govindarajan and Trimble (2012) in fact follow "prospector" strategy at the level of a new product or service, but "defender" strategy at the firm level (Miles et al., 1978). This essentially translates into simultaneously following and challenging both, dominant (innovation) logic (Prahalad and Bettis, 1986) and product design (Anderson and Tushman, 1990). Particularly large MNEs may attempt to manage this ambidex-

terity structurally (Adler et al., 1999; McDonough and Leifer, 1983; Tushman and O'Reilly, 1996), and e.g. take equity stakes in innovative start-ups which implemented reverse innovations (cf. Judge et al., 2015) but lack resources for its diffusion (Knight and Cavusgil, 2004). Such CVC investments would fall into the category of emergent investments that aim at exploring "a strategic white space – a new market with a new set of customers" (Chesbrough, 2002: 96). In addition, any enterprise pursuing reverse innovation may be better off resorting to external stakeholders' knowledge of the targeted market (London and Hart, 2004), insourcing and/or outsourcing technologies (Chesbrough, 2003; West and Bogers, 2014), or collaborating with competitors (Hamel et al., 1989). Which external leverages of the *innovation process* may potentially be resorted to is determined by the perceived (Weiss et al., 2014) or objective resource insufficiency of the enterprise in question. However, decisions whether these leverages will be *in fact* resorted to, and if so to which extent, are made depending on individual characteristics of executives (Hambrick and Mason, 1984), in a way that maintains their core self-evaluation (Judge et al., 1997); this may or may not be optimal with regard to innovation performance. As reverse innovation is a special case of organisational innovation, this may indicate why enterprises resort to external leverages of innovation in general, be it reverse or not.

On a more general note, the thesis contributes to the literature on reverse innovation empirically, theoretically and methodologically. *Empirically*, it adds a piece of evidence on the complex relationship between innovation, poverty and inequality (Cozzens and Kaplinsky, 2009). Additionally, the thesis diversifies the scarce and uniform empirical base (Subramaniam et al., 2015) by studying players (SMEs from a middle-income economy) and targeted emerging markets (Middle East, Russia, West Africa) largely disregarded so far. Finally, the thesis contributes a piece of empirical evidence on executives' cognitive "black box" (Hambrick, 2007).

Theoretically, at the country level, the thesis re-directs reverse innovation to innovation systems and domestic capability building (Lundvall et al., 2009). As promising theoretical perspectives at the firm level, particularly resource based view (Leonard-Barton, 1992), dynamic capabilities (Eisenhardt and Martin, 2000; Teece, 2007) and open innovation (Chesbrough, 2003) are suggested. We particularly contribute to the research on organisational behaviour by adding theories of self-concept maintenance (Carver and Scheier, 1981; Higgins, 1987; Mazar et al., 2008) to the theoretical framework for the link between executives' individual characteristics and strategic choices regarding the innovation process. **Methodologically**, the thesis contributes rigorous research of practical relevance to the body of literature on reverse innovation. Although we do not consider ourselves as constructivist, a grain of constructivism in our blend of critical realism and pragmatism has proved beneficial to opening the concept of reverse innovation to any enterprise and to explaining the link between cognitive factors and strategic decisions.

These contributions notwithstanding, the present thesis has nevertheless its well-recognised limitations with regard to both, content and scope. Regarding the **content**, or what the thesis *has* elaborated on, our results are by no means unlimitedly valid. India is potentially the ideal place for developed country MNEs to simultaneously achieve business performance improvements and provide social benefits to the host country (Landrum, 2007). However, our results may not necessarily stand up to the scrutiny in context of other emerging markets.

Causality of relationships and correctness of inferences are major challenges to explanatory case studies in general (Yin, 2014), and are open to criticism when it comes to our Essay C in particular. The explanation why and to which external leverages of (reverse) innovation enterprises do or do not resort appears so far generalizable solely to enterprises with a single or dominant decision maker from an individualistic culture. Individual core self-evaluation as explanatory factor will yield weaker results in environments where managerial discretion is limited (Finkelstein and

Hambrick, 1990). Where decisions regarding the innovation process are made by management teams, the explanatory framework would need to additionally consider self-concept maintenance theories of inter-individual (Festinger, 1954; Tesser, 1988) and group comparison (Hogg and Abrams, 1988; Turner et al., 1987). Finally, our results may not fully apply to executives from collectivistic cultures (Asia, Africa, parts of Central and South America) where others as the point of reference are more important than in individualistic cultures of Europe and North America (Cross et al., 2011; Markus and Kitayama, 1991).

As for limitations regarding the *scope*, or what the thesis *has not* elaborated on, some gaps in extant literature have been recognised but not filled. Most notably, the thesis criticises that several publications (Baglieri et al., 2014; Govindarajan, 2012; Zeschky et al., 2014a, 2014b) solely touch on dynamic capabilities (Eisenhardt and Martin, 2000; Teece, 2007), and suggests taking this theoretical perspective without being able itself to follow up on the suggestion. Similarly, the lack of studies about (beneficial) impacts of reverse innovation on business performance has been identified, but even our primary data do not manage to remedy this issue.

That all being said, there is yet a lot to learn about emerging markets as the new context of innovation (Vives et al., 2010). In this vein, the limitations of the thesis largely translate into promising research opportunities that the academic community might wish to pursue in future. Most notably, as argued in the General Introduction to this thesis (cf. page 27), reverse innovation is in its kernel coincident with organisational innovation in general (Crossan and Apaydin, 2010), but on its periphery inseparable from changes in geo-economic environment and international diffusion. This pushes forward a research perspective that coherently integrates two major managerial challenges to the contemporary enterprise, namely innovation and internationalisation. In order to respond to both challenges simultaneously, enterprises may need dynamic capabilities beyond commonly acknowledged sensing, seizing and reconfiguring of resources (Teece, 2007; 2010).

Relatedly, academic discussion on comparative advantages and disadvantages of different actors is invited (Burger-Helmchen et al, 2013). While the legacy of innovation by default constrains large MNEs, major obstacle to reverse innovation among SMEs is rather attributable to their tight financial resources (Knight and Cavusgil, 2004; OECD, 2013; Essay C) and in fact comparatively easy to resolve. Targeted initiatives that provide support for SMEs and start-ups in developed countries, comparable to the Canadian one depicted in Snowden et al. (2015), may induce a wave of domestic entrepreneurship for international, that is reverse, innovation.

Last but not least, future research may wish to focus on cognitive micro-impediments to innovation in general that are potentially more difficult to tackle than any lack of finance, or gaps in market knowledge, technology and business models; finally, managers' self-perception is as intrinsic to being human as innovating is.

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