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Reviewing a Decade of Research on the “Base/Bottom of the Pyramid” (BOP) Concept

Ans Kolk, Miguel Rivera-Santos & Carlos Rufin

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Abstract

In 1998-1999, Prahalad and colleagues introduced the Base/Bottom of the Pyramid (BOP) concept in an article and a working paper. This article’s goal is to answer the question: What has become of the concept over the decade following its first systematic exposition in 1999? To answer this question, the authors conducted a systematic review of articles on the BOP, identifying 104 articles published in journals or proceedings over a ten-year period (2000-2009). This count excludes books, chapters, and teaching cases. The review shows that the BOP concept evolved dramatically following Prahalad’s original call to multinational enterprises (MNEs). De-emphasizing the role of MNEs over time, published BOP articles portray a more complex picture, with wide variations in terms of BOP contexts, of BOP initiatives, and of impacts of the BOP approach. A simple framework for organizing the reviewed articles helps discuss findings, identify the gaps that still exist in the literature, and suggest directions for future research.

Keywords

Base of the Pyramid, Bottom of the Pyramid, poverty, development, multinational enterprises

The proposition that the pursuit of profits by private enterprise can relieve poverty on a large scale is not a recent idea. A long tradition in economic thought, from Adam Smith (1776) to Milton Friedman (1990), argues that market forces and private ownership of productive assets lead to a prosperous society. More recently, Hernando de Soto’s work (2000) has emphasized the entrepreneurial potential of the poor. But the proposition has gathered large attention in the management literature since 1998, after C. K. Prahalad, in collaboration with Stuart Hart, Allen Hammond, and others, developed a more elaborate business case. At the time, management scholarship saw scant potential for business engagement with the poor on a mutually positive basis, other than through philanthropic efforts. Challenging these views, Prahalad and his collaborators argued that multinational enterprises (MNEs) could grow their profits *and* help lift billions of people out of poverty by doing business with the poor. Hence, they called on MNEs to engage this segment of the world’s population, to which they referred as the “bottom” or “base” of the economic pyramid. As the literature spawned by this idea has come to be associated with

the term “Base of the Pyramid” or “Bottom of the Pyramid” (BOP), we refer to it as the “BOP concept.”

While initial aspects of the BOP concept can be identified in Prahalad’s co-authored 1998 article in the *Harvard Business Review* (C. K. Prahalad & Lieberthal, 1998), the first fully elaborated articulation of the BOP concept circulated as a working paper by Prahalad and Hart (1999) dated August 1999. Over the subsequent years, debates have emerged, approaches and definitions have evolved, and the very idea that MNEs should be searching for a fortune at the BOP has been questioned both by proponents of the BOP approach, such as Ted London (London, Hart, & Barney, 2011, August 14), and by its critics, such as Aneel Karnani (2011). The purpose here is to review the academic articles published in journals or proceedings in the decade following the launch of the BOP concept (2000-2009), in order to assess how the concept has been applied and has evolved over time, review the key questions that have emerged from the concept, and identify key areas that are still left unexplored. The authors seek to answer a simple question: *What has become of the Base/Bottom of the Pyramid (BOP) concept?*

The authors make two contributions in this article. First, they provide the first systematic review of articles building on the BOP concept. Contrasting with a traditional literature review as defined below, this review focuses on the application and evolution of the BOP concept, rather than on the broader management literature on the relationship between business and poverty alleviation, which would include distinctly different scholarly streams, such as microfinance (e.g. Chu, 2007) or subsistence marketplaces (e.g. Madhu Viswanathan, Sridharan, & Ritchie, 2010). The linkages between the BOP concept and these other bodies of knowledge are discussed in the final section of this article. The article does not analyze the literature in the traditional sense, but rather the set of articles that have explicitly built on Prahalad’s original concept. Further contrasting with a traditional literature review, the article analyzes the key aspects of the BOP approach longitudinally year by year, which allows a better understanding of the evolution of the concept over time. Second, the authors propose a simple organizing framework to discuss findings and identify unexplored areas and connections. This organizing framework will hopefully provide a basis for the continuing scholarly exploration of the BOP.

Following this introduction, the rest of this article is organized into four sections. First, the authors describe the methodology used to identify and code the relevant BOP articles, and propose a simple framework to organize conceptually the selected articles. In the next section, they discuss the broad characteristics of BOP research that emerge from the review, including the chronology, outlets and disciplines, and methods and empirics of the BOP articles. The subsequent section examines the content of BOP research, using the proposed framework to present main findings, including key constructs and ideas, and to identify research gaps. The last section offers some concluding thoughts, discusses the limitations of the procedure followed by the authors, and proposes future research avenues for publications building on the BOP concept, particularly through closer linkages to other literature streams that address business, poverty alleviation, and social development.

Methodology and Organizing Framework

The primary goal in selecting articles for this review was to avoid an ad hoc list of randomly gathered publications, which would not provide a representative picture of scholarship building on the BOP concept. Instead, the authors selected the articles to be included in the review through a systematic multi-stage procedure, ultimately resulting in a list of 104 articles published in journals or conference proceedings. Reflecting the overall goal to analyze the first decade of research on the BOP, the analysis includes articles published between the publication of Prahalad's seminal working paper on the BOP in August 1999 (thus effectively 2000 due to lag in appearances) and the end of 2009. The first sub-section describes in detail how the authors proceeded, providing the number of selected and discarded articles at each stage of the procedure, along with the selection criteria. A second sub-section outlines the coding procedure used to standardize the information contained in the articles.

The Article Selection Procedure

The authors selected the first set of potential articles by performing a keyword search in Ebscohost and Proquest, the two major online databases of published articles in business-related disciplines. They used two keywords, corresponding to the two variants of the name given to the BOP, "Bottom of the Pyramid" (e.g. Karnani, 2007c; C. K. Prahalad & Hart, 2002) and "Base of the Pyramid" (e.g. Hart & Christensen, 2002; Simanis, Hart, & Duke, 2008). The authors restricted the keyword search to peer-reviewed journals and to the citation and abstract fields only, to ensure that the articles returned were at the same time academic and focused on the BOP. They made an exception for *Harvard Business Review*, which, unlike *MIT Sloan Management Review* or *California Management Review*, is editor-reviewed and is therefore not listed as a peer-reviewed publication in databases, yet is highly relevant for a comparable managerial/academic audience as well as for the BOP debate over the years. The database search also returned three papers in conference proceedings, which were retained because some fields, such as engineering with the annual IEEE conference, tend to value them as publications.

The keyword-based search returned 102 hits with the "Base of the Pyramid" keyword in Proquest, a slightly different set of 102 hits with the "Bottom of the Pyramid" keyword in Proquest, 124 hits with the "Base of the Pyramid" keyword in Ebscohost, and 105 hits with the "Bottom of the Pyramid" keyword in Ebscohost. The different number of hits between the two databases may be explained by a slightly different set of journals being available in the database and/or by the use of a different search engine in each database. In total, the keyword-based search returned a total of 342 unique articles, after duplicates were eliminated. An additional search, jointly using "Pyramid" and "Prahalad" as keywords in both Proquest and Ebscohost did not identify any additional items, suggesting that the keyword-search procedure was thorough.

At the next stage of the procedure, the authors reviewed the titles and abstracts of this set of articles and discarded items that were either not related to the BOP concept, that repeated information published in other articles, or that only mentioned the BOP concept in passing. For instance, the keyword-search returned a number of articles in Egyptology, crystal studies,

religion, medicine, geometry, leadership, education, and law, which were all discarded. Similarly, the search returned several summaries of published studies or books on the BOP, interviews of BOP scholars, and book reviews, which were also discarded. Finally, articles that mentioned the BOP or Prahalad just once were not retained, only keeping articles in which more than one occurrence of the words could be found. This second stage in the selection procedure resulted in a set of 133 articles that could potentially be included in the review.

To increase the probability that all relevant articles would be included in the final set of articles, the keyword-based search was complemented with an author-based search in both Proquest and Ebscohost. This step started with the identification of authors with an ongoing research agenda on the BOP by listing the authors with two articles or more in the set of 133 selected at the previous stage of the selection procedure. An author-based search for the 25 authors that met that criterion was then conducted, restricting the search to articles published after 1995, since Prahalad's first publication developing BOP-related ideas was published in 1998 (C. K. Prahalad & Lieberthal, 1998). It is interesting to note that some articles focusing on BOP-related issues and written by active scholars in the field who explicitly refer to the BOP concept, such as Aneel Karnani, did not come up in the original keyword-based search. This situation may be explained by the fact that some authors do not include the term "BOP" in their keyword list or in their abstract, or, more simply, by Proquest's and Ebscohost's management of keywords. The additional step led to a further 28 articles, which justified the two-stage search procedure, resulting in a total of 161 articles after the keyword-based and the author-based searches were completed.

In the final stage of the selection procedure, the authors of this study read all 161 articles identified after the completion of the keyword-based and author-based searches. They discarded an additional 56 articles upon reading, because the actual content of the article was not directly related to the BOP, such as Chu's (2007) study of the microfinance industry or Ambastha & Momaya's (2004) study of Indian software firms' competitive position. This reading led to a final set of 104 articles being selected for the review.

The Coding Procedure

The authors coded each article and incorporated the results into a database in order to standardize the information contained in the articles and to facilitate the identification of trends in the literature. They coded seven main aspects of the articles:

- 1) The type of article as well as journal of publication, to identify the target audience of the article.
- 2) The objective of the article, including the explicit or implicit research question and the main conclusions of the article.
- 3) The focus of the article, including its academic field, and whether the article has a geographic, industry, or firm focus.
- 4) The concepts and methodology used in the article, including the definition of the BOP given in the text; the 'empirical' definition of the BOP, corresponding to the population

targeted by the examples cited in the article; the key constructs and the theories used in the reasoning; as well as the overall methodology of the article.

- 5) The type of BOP business model described in the article, including two major aspects: the position of the poor in the value network of the model, to identify whether they are seen as producers, consumers, or employees; and the mode of engagement of the poor, to identify whether they are seen as co-inventors of the model, recipients of an adapted product/model, or recipients of a non-adapted product/model.
- 6) The international aspects of the BOP model, including whether an MNE is involved in the initiative, and, if so, whether the MNE or the local subsidiary initiated and managed the BOP model.
- 7) The outcome of the BOP initiative, including its economic, social, and environmental aspects, if mentioned.

The categories were thus selected to represent not only the type of research discussed in the article and its connection to existing literatures and concepts, but also the specific aspects of the BOP approach emphasized in a given article, reflecting the unique questions and foci prevalent in BOP studies. To ensure consistency, six articles were randomly selected and independently coded by the authors. After comparing the results, the coding procedures were fine-tuned to eliminate inconsistencies across coders, and each author coded about a third of the remaining articles separately. The Appendix presents a complete list of the 104 articles identified in the review. This coding further allowed the authors to organize the BOP articles in a simple framework structured around four major themes, representing the different aspects of the BOP concept: the definition of the BOP, the initiator of the BOP initiative, the BOP business model, and outcomes of the BOP initiative (see Figure 1). As discussed below, this framework also facilitates the identification of gaps and underexplored research avenues, and thus helps set a research agenda for the academic study of the BOP.

*** Insert Figure 1 about here ***

The Broad Characteristics of BOP Research

Before moving to the more specific content of BOP research in the rest of the article, this section provides an analysis of the broad dimensions of the 104 BOP articles, including the chronology of publications, the type of outlets in which BOP articles were published, the disciplinary focus in BOP articles, and the methodological approaches favored by BOP scholars. The authors' main concern in the analysis was to identify the emerging characteristics and trends in the study of the BOP, particularly the type of research and research questions, the connection to existing literatures, the prevailing concepts and arguments, and the impact of BOP initiatives. Reflecting the evolution of the BOP concept since first introduced by Prahalad and colleagues, the review is not only a cross-sectional analysis of BOP articles but also analyzes how important aspects of BOP studies have developed over the years. In the discussion of the findings of the review, the authors sometimes provide illustrative references to a few articles that showcase the

observations made.

The Chronology of BOP Research

As mentioned earlier, the initial aspects of the BOP concept can be identified in Prahalad and Lieberthal (1998), and the first fully elaborated articulation of the BOP concept appeared in working paper form in Prahalad and Hart (1999). The chronology of the articles studying the BOP is presented in Figure 2. Actual publication of BOP articles did not occur until 2002, most probably reflecting the lag inherent to academic publications, when four articles co-authored by Prahalad were published. While some first articles were published between 2002 and 2005, the real impact of the BOP concept on scholarship started in 2007, when the number of articles published each year experienced a significant and lasting increase.

*** Insert Figure 2 about here ***

The Outlets and Disciplines in Which BOP Articles Are Published

While acknowledging that the distinction between journals that also target a practitioner audience (such as *Harvard Business Review*, *MIT Sloan Management Review*, or *California Management Review*), and those that mainly target an academic audience (such as *Strategic Management Journal* or *Journal of International Business Studies*) is somewhat subjective and open to debate, a review of the outlets of the 104 BOP articles finds that a majority were published in journals targeting practitioners. This placement reflects not only Prahalad's choice of journals for the foundational BOP articles (C. K. Prahalad & A. L. Hammond, 2002; C. K. Prahalad & Hart, 2002; C. K. Prahalad & Lieberthal, 1998), but also the fact that the most widely read and prestigious practitioner-oriented journals, particularly *Harvard Business Review*, *California Management Review*, and *MIT Sloan Management Review*, have each published several BOP articles (Akula, 2008; Anderson & Markides, 2007; Brugmann & Prahalad, 2007; Chesbrough, Ahern, Finn, & Guerraz, 2006; Fernández-Aráoz, 2007; Hart & Christensen, 2002; Karnani, 2007b; London, 2009; Olsen & Boxenbaum, 2009; Perez-Aleman & Sandilands, 2008; C. K. Prahalad & A. L. Hammond, 2002; C. K. Prahalad & Lieberthal, 1998; Simanis & Hart, 2009; Vachani & Smith, 2008).

By contrast, the number of BOP articles published in the most prominent traditionally academic journals is more limited, and represents about a fifth of all BOP articles published. The list includes articles published in top journals such as the *Journal of International Business Studies* (London & Hart, 2004; Ricart, Enright, Ghemawat, Hart, & Khanna, 2004), the *Journal of the Academy of Marketing Science* (Arnould & Mohr, 2005), and the *Strategic Management Journal* (Karnani, 2007a). The Karnani article published in SMJ is a critique of the BOP concept in the form of a research note.

The asymmetry in the number of articles published in the two types of outlets is interesting. The large number of articles in practitioner-oriented journals may reflect a preference of BOP scholars for high-impact articles with direct application among practitioners; but it might also be due to the type of studies prevalent in BOP articles, including case studies or studies with

limited theoretical contributions, which can prove more difficult to publish in some academic journals. The small number of BOP articles in the top academic outlets might also reflect what has been called the “parochial” nature of journals (Daft & Lewin, 2008), with editors and/or reviewers disfavoring new research streams.

The asymmetry also comes to the fore in the main goals of the BOP articles. Most articles focus on offering advice on strategy and marketing for companies that want to enter the BOP (e.g. Olsen & Boxenbaum, 2009; Weiser, 2007). On a significantly smaller scale, some articles are devoted to the evaluation and critique of BOP ideas and initiatives (in particular Aneel Karnani's work, 2007a, 2007b, 2007c, 2008a, 2008b, 2009a, 2009b). Another group of articles reports on cases of BOP initiatives, mainly to describe products considered to be suitable for the BOP by the authors (e.g. Prasad & Ganvir, 2005; Whitney & Kelkar, 2004). The last identifiable cluster of articles, with only six articles, focuses on the description of BOP market characteristics (e.g. Guesalaga & Marshall, 2008; Ireland, 2008). The limited number of articles in this cluster is somewhat surprising given the extent to which the uniqueness of BOP markets is emphasized in BOP research (Rivera-Santos & Rufin, 2010).

The variety of disciplines in which BOP studies are published also presents an interesting picture. A cross-sectional analysis of the articles reveals that most of them focus on strategic management and marketing. A smaller number of articles published in information technology, economic development, and corporate social responsibility (CSR) or business ethics outlets also appeared in the search. This finding is not surprising given the concerns of the BOP approach with poverty alleviation and thus its close connection to ethical and CSR issues, and given the importance of IT in this literature, as we discuss below. A year-by-year analysis of the disciplines in which the articles are published, presented in Figure 3, suggests that, as the impact of the BOP concept spreads in the management field, the number of disciplinary perspectives used to analyze the BOP increases considerably.

*** Insert Figure 3 about here ***

Interestingly, although most articles are in English, the search returned a few in other languages, such as Portuguese (Carvalho Suarez, Moreira Casotti, & Cunha de Almeida, 2008; da Rocha & da Silva, 2009), Spanish (Márquez, 2007; Mutis & Ricart, 2008), German (Hahn & Wagner, 2009), and Chinese (Jiang, Yan, & Shi, 2006), indicating some diffusion of the BOP idea beyond academic institutions in the English-speaking world.¹ This finding, however, may reflect the search procedures in the article databases used for this review as much as the international diffusion of BOP research.

Methods and Empirics in BOP Articles

The number of articles that can be regarded as conceptual (i.e. articles that may include examples as illustrations, but without empirical tests) slightly exceeds the number of empirical articles (i.e. articles that include an empirical test, quantitative or qualitative). Among the empirical articles, only four entail large-sample studies (De Angoitia & Ramirez, 2009; Dolan &

Scott, 2009; Guesalaga & Marshall, 2008; Sinha, 2008); the rest are based on case studies, which may reflect the difficulty associated with collecting reliable large-sample data in BOP and other non-traditional settings (Kriauciunas, Parmigiani, & Rivera-Santos, 2011). The year-by-year analysis presented in Figure 4 suggests that, in spite of a prevalence of conceptual and case study-based articles, the variety of methodologies found in BOP articles has increased considerably since 2007.

*** Insert Figure 4 about here ***

Most surprisingly, a remarkable concentration of examples and cases comes from a relatively small set of countries, industries, and even companies, as shown in Figures 5 and 6, although the variety has increased over time. India accounts for the vast majority of illustrations found in BOP articles; a much smaller number of cases and examples originate in Bangladesh, China, the Philippines, South Africa, Kenya, and Latin America, especially Brazil. In terms of industry, we observe a significant although less marked concentration, with information and communication technologies as the primary source of examples and cases. Several other examples come from household products and financial services, plus a few from health care, energy, and water supply.

*** Insert Figures 5 and 6 about here ***

The set of companies involved in the cases and examples in the BOP literature is also revealing. Cited far and beyond all others is the case of Unilever's Indian subsidiary, Hindustan Lever Ltd. (HLL). Grameen Bank, which is actually a non-profit with for-profit arms and very limited operations outside of Bangladesh, is also a frequently cited organization. Hewlett-Packard and Mexican cement giant Cemex appear in several articles, although far fewer than HLL or Grameen Bank. Not only is the set of cases limited, but the set of articles identified through the search mention MNEs in a very limited way, a surprising result for a concept originally developed with MNEs in mind. Even where the examples cited are MNE-led initiatives, the articles provide very little information about the relationship between headquarters and subsidiaries in the origination and management of BOP initiatives. This finding appears to reflect a significant and fast evolution of the BOP concept from an original emphasis on MNEs to a much broader view, in which not only small and domestic companies, but also not-for-profits play an important role.

The Content of BOP Articles: Findings, Gaps and Future Research Directions

Referring to the framework in Figure 1, this section discusses the content of the articles included in the review, identifies gaps and underexplored research avenues, and thus helps set a research agenda for the academic study of the BOP. The framework emphasizes the four main topics that emerged from the analysis of BOP articles: the definition of the BOP, the initiators of BOP initiatives, the characteristics of BOP business models, and the outcomes of BOP initiatives.

Definitions of the BOP

The key claim of the BOP concept is that poverty can be alleviated through financially profitable activity. As a consequence, the definition of the BOP itself is a fundamental element of BOP research. The definition and measurement of poverty has generated a great deal of controversy in the economic development literature since the inception of this field after the end of the Second World War (World Bank, 2000), leading to a gradual expansion of the concept beyond attention to basic needs such as nutrition. For these reasons, it is revealing to examine how poverty is defined and measured in BOP articles. Following the lead of foundational articles by Prahalad and co-authors (C. K. Prahalad & A. L. Hammond, 2002; C. K. Prahalad & Hart, 2002), most articles that provide an explicit definition use a per capita income at or below \$1,500 or \$2,000 per annum (expressed on an internationally comparable “purchasing power parity” basis). Other authors refer to the poverty threshold of \$1 or \$2 per day, widely used in both academic and practitioner discussions of poverty (Banerjee & Duflo, 2007).

More imprecise and often implicit definitions also abound, however, with many references to the “4 billion” poorest people in the world who reportedly live on the income levels mentioned above (e.g. Hammond & Prahalad, 2004; Hart & Christensen, 2002). Examples are often drawn from initiatives targeting rural populations in general (e.g. Zala & Patel, 2009), rural women (e.g. Schwittay, 2009), slum dwellers (e.g. Whitney & Kelkar, 2004), or often more simply “the poor” (e.g. Heeks, 2008). Other authors equate the BOP with entire countries or regions (e.g. Ahmad, Gorman, & Werhane, 2004). Some articles consider low-income populations in a general sense, which may extend well above poverty lines to include, for instance, people in a position to afford a \$3,000 car (Van den Waeyenberg & Hens, 2008). The divergence of definitions results in studies focusing on very different target populations and settings. The lack of precision has, in turn, fueled criticism of BOP research, especially from Karnani (2007c), who claims that most BOP initiatives discussed in the literature do not actually target the BOP. This review confirms that the usage of the term is blurred and frequently imprecise, leading to different articles studying very different “bases” of the pyramid.

Guesalaga and Marshall (2008, pp. 415-417), for example, calculate the buying power indices (BPI) for the BOP, defined as consumers with an annual income of \$3,000 or less. They find that the buying power index of the BOP relative to mid and high-income segments is about 51%. Within the BOP, they find that the buying power index of the two lowest income tiers represent about 80% of the total BOP buying power index, the lowest tier (less than \$1,000) representing 43% and the second tier (between \$1,001 and \$2,000) representing 39%. Geographically, they also find significant variation, with more than 70% of the BOP consumers located in Asia. Ireland (2008) further argues that a distinction must be made between the urban and the rural BOP. Using a calculation without purchasing power parity adjustments, which he considers a better representation of market sizes at the BOP, he argues that the spending on consumer goods in the shantytowns of the three largest cities in Venezuela is between five and ten times higher than that of the whole Indian rural BOP population, and that the proportion of manufactured consumer goods bought by Latin America’s urban BOP populations is in the 50-

75% range of the national total, compared to 1-5% in rural Asian and African areas.

These examples illustrate the variation that exists across BOP populations and reinforce the idea of a variety of thresholds and dimensions, such as poverty lines or vulnerability, as a way to measure poverty. Such an approach is prevalent in the economic development literature (Chen & Ravallion, 2008) and other research streams (Chaturvedi, Chiu, & Viswanathan, 2009). As a consequence, proposing an exact definition of the BOP that would apply to all situations might be not only difficult but also counterproductive. However, having a wide variety of co-existing meanings for the same concept, combined with the fact that quite a few articles do not provide any definition for the BOP, is likely to create confusion and hamper theory building and generalization in the literature.

The results of this review therefore suggest that it is important for authors to define explicitly the type of BOP population they discuss in their articles. Clearly articulating the different segments of the BOP, such as poverty levels (e.g. extreme, moderate and relative poverty, as in da Rocha & da Silva, 2009), urban versus rural locations (e.g. , 2008), or the degree of isolation from mainstream markets (e.g. Rivera-Santos, Rufin, & Kolk, 2012), among others, could also help better understand the BOP (cf. Figure 1).

The Initiators of BOP Initiatives

Prahalad's original work was a call for MNEs to target BOP markets and thus help alleviate poverty (C. K. Prahalad & A. L. Hammond, 2002; C. K. Prahalad & Lieberthal, 1998). This review shows that the original approach has evolved drastically over the last decade, and that, overall, only a small number of reported BOP initiatives are led by MNEs. A few examples, such as Hindustan Lever Ltd. in India, Hewlett-Packard in Africa, Avon in South Africa, Cemex in Mexico, and SC Johnson in Kenya, are often cited and therefore highly visible. Yet, these few and visible examples are not representative of the much wider set of initiators of reported BOP initiatives, and most of these initiators are not the large MNEs that Prahalad appears to have aimed at originally.

Many BOP initiatives appear to be initiated by small, rather than large, and local, rather than multinational, firms. Brinkerhoff (2008), for example, relates the story of Thamel.com, a small internet venture bridging the communication gap between the Nepalese diaspora and their poor relatives in Nepal. Arnould and Mohr (2005) describe the BOP innovations of local companies in Zinder, Niger. Anderson and Markides (2007) analyze the BOP strategy of Smart Communications, a Philippines-based mobile phone operator.

In fact, not all BOP initiatives presented in the literature are initiated by for-profit firms, which is somewhat surprising considering that the core premise of the BOP concept is the possibility to combine profits with poverty alleviation. The initiator of one of the most often cited examples of successful BOP projects, Grameen Phone (Altman, Rego, & Ross, 2009; Anderson & Kupp, 2008a; Chesbrough et al., 2006), is a joint enterprise created by a for-profit company, Telenor, and the arm of a non-profit organization, Grameen Telecom Corporation. Similarly, the Akshaya project in Kerala, cited as an example of a BOP initiative bringing

modern communication technologies to the poor (Kuriyan, Ray, & Kammen, 2008), was initiated by the local Kerala government, rather than by a firm.

This result highlights a need not only for clear definitions and explicit segmentation of BOP populations, but also for a better understanding of the different roles that large and small MNEs, large and small domestic companies, social entrepreneurs, and not-for-profit organizations can play in BOP initiatives. Close examination of the characteristics of the initiators of BOP initiatives can shed light on the differences between MNE-led and locally-led BOP initiatives. Above all, the significance of not-for-profits in BOP initiatives that emerges from this review points to a more complex relationship between profitability and poverty alleviation than originally thought, and, as such, calling for further investigation.

BOP Business Models

BOP scholars argue that, in order to combine profit with poverty alleviation on a large scale, firms need to create radically new business models and reinvent products adapted to the BOP (London & Hart, 2004; Ricart et al., 2004; Simanis & Hart, 2009). BOP initiatives, contrasting with traditional business initiatives, are thus expected to view the poor's position in the value network not only as consumers but also as entrepreneurs (Karnani, 2009b), and to engage the poor not just as recipients of existing products, but also as co-inventors of BOP initiatives (Simanis & Hart, 2009). Yet the results of our review show that the vast majority of the articles included in this review regard the poor primarily as consumers (see Figure 7).

*** Insert Figure 7 about here ***

Considering the horizontal axis of Figure 1, 67 articles describe the BOP as a potential market, against 38 articles which consider alternative roles for the poor as: employees (e.g. Whitney & Kelkar, 2004), partners (e.g. Brinkerhoff, 2008), or entrepreneurs (e.g. Dolan & Scott, 2009). Interestingly, the type of entrepreneurship described in BOP articles differs considerably from the entrepreneurial ventures envisaged in developed countries. Like most entrepreneurship in developing countries (Banerjee & Duflo, 2007), it typically involves activities involving few or no specialized skills, very low barriers to entry, and limited or no scalability. Most of the examples of BOP entrepreneurs found in the reviewed articles are actually introduced by the BOP initiative itself, rather than being proposed by the poor, and involve product distribution activities (e.g. Anderson & Billou, 2007; Dolan & Scott, 2009; Johnson, 2007), although a few examples of the poor as producers or suppliers do exist (e.g. Altman et al., 2009; Hahn, 2009). The Akshaya project in Kerala (Kuriyan, Ray, & Kammen, 2008), for example, encourages local entrepreneurs to create and manage small internet and phone booths, with seed money and training provided by the Kerala government. Similarly, Avon cosmetics successfully extended its unique distribution model, which relies on women using informal networks to sell cosmetics, to poor Black communities in South Africa. In this case, the women receive a standardized training before they are given the opportunity to sell Avon cosmetics to their friends (Dolan & Scott, 2009). These conditions have led Karnani (2008b) to argue that, although in these initiatives the

poor are entrepreneurs in a literal sense, for most of them entrepreneurship is actually just an imperfect substitute for the salaried job they would prefer to have instead.

Similarly, considering the vertical axis of Figure 1, the review found very few examples of BOP initiatives in which the poor were engaged as co-inventors, in contrast with many authors' calls for MNEs to engage the poor in such a role, rather than as mere recipients of the BOP initiative (e.g. Jiang & Kandachar, 2008a; Johnson, 2007; Jose, 2008; Sarabhai, 2008). Most significantly, in most of the cases in which the authors claim co-invention, a careful analysis of the BOP initiative leads to a more sobering conclusion. A description of SC Johnson's BOP initiative in Kibera, a slum of Nairobi, Kenya, by a manager at SC Johnson (Johnson, 2007) illustrates this point. The article describes SC Johnson's employees living and working in the slum for nearly three months to gain a deeper understanding of the community. But the BOP initiative that SC Johnson eventually developed was based on a partnership with a local, although US-funded, non-governmental organization (NGO), called Carolina for Kibera (CFK), rather than on collaboration with the community at large. CFK organized groups of youth already working with the NGO to provide Community Cleaning Services, in which the youth offered house cleaning services to Kibera residents using SC Johnson products. Although this system of distribution is significantly different from SC Johnson's traditional model, this BOP initiative can hardly be described as the result of a co-invention process with the local community, given the role of the NGO in the development of the initiative. This example reflects the difficulty associated with co-inventing BOP initiatives with the poor in practice.

The vast majority of the examples provided in the articles engaged the poor as recipients, rather than as co-inventors. Twenty-seven articles report that the BOP initiative provided an already existing product or service to the poor, while 34 report significant adaptation of the product or service for the poor. Some firms offer existing products in smaller packaging, leading to lower price points for each unit, as in the often-cited case of Hindustan Unilever (e.g. Ahmad et al., 2004). Others modify the functionalities of, or the technology behind, existing products, as is the case of China's Haier developing washing machines that can also be used to clean vegetables (Anderson & Billou, 2007). According to our review, then, most BOP initiatives studied may not involve co-invention in the strict sense, but a majority of initiatives do require a significant level of adaptation of an existing product or business model.

Looking at the overall positioning in Figure 1, it is interesting to note that while many articles are located in the lower left corner, corresponding to the poor being viewed as consumers of existing or adapted products, the rest of the articles cover the entire spectrum along both axes. Most BOP models reported in the literature view the poor as consumers of existing or adapted products and are thus located in the lower left corner of the graph. These initiatives thus seem to be a relatively natural extension of the type of product adaptations that firms frequently need to accept when they enter a market with different characteristics. In the BOP initiative reported by Prahalad and Hart (2002), for instance, Hindustan Lever Ltd. realizes that Nirma, a low-cost detergent producer, is eroding its market share by targeting the low end of the market and decides to react to it by targeting the BOP. This reaction is not radically different from

companies in the developed world facing competition from low-cost competitors and deciding to target the low end of the market in response.

As the reported initiatives move up the left axis, however, the degree of adaptation becomes higher, leading to significantly different business models. At the top left corner of the graph are articles presenting BOP initiatives in which the poor co-invent the product with the firm, although such examples are still rare. Jiang and Kandachar (2008a, 2008b; 2006), for instance, describe how they spent a significant amount of time in five rural villages in the Shanghai, China region to understand the medical needs of the elderly poor and used their input to design a medical digital assistant targeting the BOP. Interestingly, while much of the literature argues that co-invention and local entrepreneurship should be essential elements of any BOP model (Jose, 2008), the authors found very few cases of BOP models. One example is Arnould and Mohr (2005), who describe locally-initiated leather-working clusters of small firms in West Africa that work at the BOP. This scarcity of examples most probably reflects the difficulty associated with co-invention, as illustrated by the complexity of initiatives such as the BOP Protocol (Simanis & Hart, 2008).

The variety of BOP initiatives found in the literature indicates that one-size-fits-all approaches, with calls for co-invention throughout the BOP or, conversely, with claims that BOP initiatives are simply a special case of market entry, seem inappropriate for a context characterized, as mentioned above, by wide variations. The findings of this review therefore point to a need for not only a deeper analysis of the variety of BOP business models that are applicable to different contexts (in terms of both countries and industries), but also for a better understanding of the continuum that may exist between traditional market entry and BOP initiatives.

Outcomes of BOP Initiatives

The analysis of BOP articles finally explored the three types of impacts associated with the “triple bottom line” approach (Elkington, 1994). The issue of impact measurement has emerged as a particularly important discussion among BOP scholars (e.g. London, 2009), reflecting the variety of approaches found in the first decade of BOP research. The findings relating to the economic, social and environmental impacts, respectively, are examined below.

Forty-five articles contained explicit consideration of the economic impact of BOP initiatives for the firm, using profit or other proxies, such as price, cost, margin, profit, revenue, market penetration, customer-base growth, number of customers, dividends, and market capitalization, as measures of performance. Roughly half of these articles do not actually measure the economic impact on the firm, focusing on potential market size and leaving the potential for profitability implicit in the discussion. Of the 34 articles in which an attempt at measurement is made, 25 report favorable outcomes, suggesting that, when reported, the economic impact of BOP initiatives for the firm is generally positive, even though direct assessments are difficult. Akula (2008), for example, reports positive profit margins for SKS microfinance, without indicating the actual profit margin. Similarly, Hart (2005) mentions that

Solar Electric Light in Bangalore, India, is profitable, but does not provide any detail. Some authors use firm-level, rather than BOP-initiative-level, measures to assess profitability. Lakshman (2009), for instance, cites a 30% increase in market capitalization for ITC Ltd as its focus on BOP markets grows.

The findings from this review thus further point to a strong need for more rigorous reporting of the actual economic impact of BOP initiatives. Indeed, the lack of profit reporting in examples portrayed as successes, and the suggestion by some authors that marketing insights (product trial, brand building, and BOP consumer information) are better success measures than profits at the BOP (Johnson, 2007), can undermine the profitability claim of the BOP concept. A reporting of the profitability (or lack of profitability) of specific BOP initiatives would also help identify which types of BOP models are more likely to be profitable, and lead to a deeper understanding not only of the relationship between profit and poverty alleviation, but also of the impact of different types of organizations on BOP initiatives.

The social impact on local populations is considered in forty-eight of the 104 BOP articles, which is a slightly greater number than those that pay attention to economic impacts. Again, the analysis of published articles shows a wide variety of measures, including education, health care, water quality, employment, business income generation, and harder to define terms such as empowerment, quality of life, and reduced exploitation. Of these 48 articles, only 28 provide measured results. As is the case with the economic impact of BOP initiatives, the social impact reported by the authors is mostly positive, with 20 articles reporting a positive social impact on the local population. It is worth noting that, of the eight articles that report negative impacts, five are written by Aneel Karnani (2007a, 2007b, 2007c, 2009a, 2009b) and draw on a very limited set of cases, as Karnani often re-analyzes cases introduced previously by Prahalad.

The scarcity of objective assessments is important, considering the claim of the BOP concept about poverty reduction, and the fact that most BOP models view the poor as consumers. An analysis of BOP consumption categories (Subrahmanyam & Gomez-Arias, 2008) proposes the existence of broad segments based on primary consumption motivations, with each consisting of various product/needs categories and, in turn, various potential social impacts of the BOP initiative: 1) basic needs (food, energy, housing, and water/sanitation); 2) basic infrastructure (transportation, health, and financial services); 3) basic education, skills training, and knowledge gathering; 4) information and communication; 5) discretionary purchases and “finer things in life” (personal care, hygiene and beauty products, clothing, negative goods such as tobacco and liquor, household appliances, TV, cultural and spiritual, entertainment, and sports); 6) marketplace for selling labor, skills, craft, or produce. The latter category refers to market access, obtained via either electronic or traditional marketplaces (see Vachani & Smith, 2008), which is crucial to poverty alleviation. The type of product or need covered by the BOP initiative is thus likely to strongly influence its social impact. Here as well, this review suggests a need for explicit and objective measures of social impact.

Of the three bottom lines, the environmental aspect receives the least attention, with only 17 articles mentioning it. The articles that go beyond general calls for attention to environmental

sustainability almost exclusively focus on waste generation. Only eight articles report actual evaluations of the environmental impact, among which six are considered positive by the article authors. Thus, only a minority of studies considers, let alone measure, the environmental impact of BOP initiatives. A central question is whether behavior in developed markets will be copied when accessing BOP markets and integrating the poor into the global marketplace, increasing their consumption and production levels. As Hart and Christensen (2002, pp. 54-55) put it, “if the developed world’s model of commerce and consumerism were to become the standard everywhere, it would require the equivalent of more than four Earths to supply the raw materials, fossil fuels and waste sinks that would be needed. Clearly, a different model is called for.” In this context, the relative lack of attention to the environmental implications of BOP initiatives in the literature is surprising. Hart and Milstein (2003), in their “sustainable value” framework, for instance, discuss clean technology, pollution prevention, and product stewardship alongside BOP strategies (to meet “unmet needs”), but do not discuss in detail the structural relationship (and potential dilemmas) between them, such as waste in poorly regulated areas or increased transportation needs. Some authors note, on the other hand, that poverty also negatively affects the environment, as the struggle for survival can cause environmental degradation, which suggests that improving the situation of the poor also benefits the environment (Hahn, 2009).

As the findings from this review show, empirical evidence of the economic, social, and environmental impact of BOP initiatives is somewhat limited, and an overall assessment of the impact of the BOP approach is made more difficult by the wide variety of measures used in different studies. Recently, Ted London has proposed a set of measures to assess the impact of BOP initiatives (London, 2009). However, the issues that emerge from this review may be more complex than measuring an impact, as difficult trade-offs seem to appear between profitability, social impact, and the environment. A better understanding of these trade-offs is therefore urgently called for.

Discussion and Conclusions

The goal for this article was to answer the question: *What has become of the Bottom/Base of the Pyramid concept?* To that end, the authors conducted a review of a decade (2000-2009) of published articles on the BOP since the initial circulation by Prahalad and Hart (1999) of their foundational working paper on the BOP concept. This review concludes that the BOP concept evolved dramatically following Prahalad’s original call to MNEs. De-emphasizing the role of MNEs over time, ten years of published BOP articles portray a more complex picture, with wide variations in terms of BOP contexts, of BOP initiatives, and of impacts of the BOP concept. Organizing the reviewed articles in a simple framework helps to discuss findings and identify the gaps that still exist in the literature, and to suggest directions for future research.

Overall, the review leads to a call for precise definitions and explicit analyses of the characteristics of the BOP initiative discussed in future BOP articles. In particular, authors need to be particularly clear regarding their definition of the BOP, as variations across BOP contexts are likely to make quick generalizations and discussions that would apply throughout the BOP

questionable. Similarly, the findings of this review show that, contrasting with Prahalad's original idea that large MNEs had a central role to play in BOP initiatives (C. K. Prahalad & A. L. Hammond, 2002; C. K. Prahalad & Lieberthal, 1998), only a small number of reported BOP initiatives are led by MNEs. BOP scholars have thus highlighted the important role that can be played not just by large MNEs, but also by small companies, domestic companies, social entrepreneurs, and even not-for-profit organizations and government agencies. Thorough discussions of the role of different actors in BOP initiatives are therefore called for, as these discussions carry important implications for the very notion of profitability at the BOP. Moreover, as many cases and examples originate from India and other emerging economies, a broadening of the empirical base, particularly to Africa, seems necessary, paralleling recent calls for more research on this continent (Egri & Ralston, 2008; Kolk & Lenfant, 2012; Kolk & Van Tulder, 2010).

This review also shows significant variation across BOP business models, ranging from initiatives resembling traditional low-end market entry to initiatives emphasizing BOP-specific co-invention. These conclusions lead to a call for a deeper analysis of the various business models at the BOP. Given the variation that exists across BOP contexts, across products and industries, and across consumer needs, different BOP business models are likely to be necessary in different BOP settings, opening fascinating avenues for future research. Finally, while measures are now available for BOP scholars to build on (London, 2009), we are only beginning to understand the trade-offs that may exist between profitability, social impact, and impact on the environment. A better understanding of these trade-offs seems to be a crucial task for future research.

As is the case for any study, this article has limitations. The article's findings are dependent of course on the effectiveness of the literature identification methodology. There is no good way of estimating the likely effects on the findings of significant errors in that methodology. Furthermore, assuming reasonableness of the literature identification methodology, the findings are limited to the decade 2000-2009. The review only included published articles. While this approach is typical of literature reviews (Short, 2009), BOP scholars, including Prahalad, have published influential books which are not considered in this review. The search was also restricted to articles that explicitly refer to the BOP concept – the premise that business can both reduce poverty and make a profit on a large scale – as developed by Prahalad. While this approach is consistent with the goal of understanding the impact and evolution of the BOP concept, it excluded several major research streams that approach the phenomenon of poverty from distinct angles, particularly development economics, microfinance, subsistence marketplaces, inclusive business, and social entrepreneurship, which often predate the emergence of the BOP concept. Just as BOP researchers seem to be moving away from searching for the “fortune at the bottom of the pyramid” (London et al., 2011, August 14) or towards BOP 2.0 (Simanis & Hart, 2008), scholars in the microfinance, subsistence marketplaces, inclusive business, or economic development literatures are incorporating profitability into their arguments (e.g. Chu, 2007), thus creating strong potential for cross-fertilization. Taking advantage of the

many complementarities of these streams would clearly benefit the overall understanding of the relationship between business and poverty. With this potential in mind, below are some ideas highlighting the great potential for cross-fertilization in this field.

Development economics, as the field with the oldest and most extensive research tradition on poverty, offers a large and diverse body of scholarship on the phenomenon of poverty in developing countries. Yet, development economists tend to be unaware of the insights stemming from the fields of business and management. Although a review of this body of scholarship is outside the scope of this study, examination of the references in the recent work of some of the best-known contemporary development economists (Banerjee & Duflo, 2007; Deaton, 2010; Ravallion & Chen, 2009), as well as recent publications on economic development in the *Journal of Economic Perspectives* and the *Journal of Economic Literature* shows no citations of business or management authors or journals. The most significant aspect of the evolution of this field has been, in the authors' view, the expansion of the concept and measurement of poverty from a purely income-based definition to a multi-dimensional construct that includes material deprivation, lack of education, ill health, vulnerability, and voicelessness and exclusion (World Bank, 2000). BOP researchers could benefit from expanding and refining the definition of the BOP to include these additional dimensions. A more encompassing perspective on poverty could also help them to analyze the impact of BOP initiatives on poverty more comprehensively. In this regard, BOP scholars may also gain, where conditions allow it, from a major recent contribution of development economics: the use of quasi-experimental research designs to evaluate the poverty impacts of specific interventions such as BOP initiatives (Banerjee, Duflo, Glennerster, & Kinnan, 2010). Likewise, development economists can profit from the insights that the BOP approach offers from a variety of business research fields.

Microfinance – the concept of offering loans to the poor through innovative reductions in transaction costs – was developed by Mohammad Yunus (Yunus, 1994) some two decades before Prahalad's foundational BOP paper. Although sometimes used in the BOP literature as an example of a BOP initiative (e.g. Akula, 2008), microfinance initiatives have been developed to a large extent by non-profit organizations such as Grameen Bank and Acción Internacional, rather than for-profit firms, and thus would not fit Prahalad's original formulation of the BOP concept. Yet, the path blazed by microfinance innovators like Yunus is of direct relevance for BOP scholarship in terms of the extensive experience accumulated in the development of low-cost business models, adaptation to a great variety of social and economic conditions around the world, and evaluation of social outcomes. At the same time, BOP research into ventures in other sectors, such as utilities, may offer important insights for microfinance, for example in helping analyze the increasingly important role that government regulation plays in some BOP settings (Márquez & Rufin, 2011). Interestingly, microfinance entities in the field are rapidly learning already about the cross-fertilization from other sectors, such as mobile phones (Jack & Suri, 2010).

The subsistence marketplaces approach studies subsistence consumers and entrepreneurs, starting at the micro level, and focusing on the qualitative nature of poverty at or near

subsistence. From this stream of research, BOP scholarship can gain a fine-grained understanding of the consumption and expenditure patterns of the poor, as well as of the market structures that characterize their environment. Insights from this literature can also help scholars better understand the different activities that generate income and other resources for poor households and individuals. For example, researchers engaged in subsistence marketplace research have shown that, among low-income women in India, those with a lower literacy level possess a greater degree of belief in personal agency (Chaturvedi et al., 2009), a finding that can help companies gain a subtler and richer perspective on BOP populations. In recent years, several articles have pointed to the bridges that exist between BOP and subsistence markets scholars (e.g. Arya & Salk, 2006; Rivera-Santos et al., 2012).

The socially inclusive business literature (e.g. Arya & Salk, 2006; Mair, Martí, & Ventresca, 2012) emphasizes the impact of business through the engagement of the poor as suppliers, not only of labor but also of commodities and other inputs. As in other cases, this literature emerged independently of the BOP stream, in connection with long-standing concerns about the impact of foreign direct investment on the poor and social conditions in globally-linked value chains. As the BOP literature has increasingly looked at business impacts through supplier and co-creator relationships, it has converged strongly with the research on socially inclusive business, benefiting for instance from the wealth of case studies produced by this stream (Márquez, Reficco, & Berger, 2010).

The social entrepreneurship stream has brought attention to a variety of hybrid enterprise models that combine social impact with profitability, and thus may have directly applicable implications for the development of successful BOP business models (e.g. Dacin, Dacin, & Matear, 2010). On the other hand, the BOP literature, with its emphasis on how to achieve scale, can encourage social entrepreneurship scholars to explore the potential and the constraints faced by social entrepreneurs in broadening their social impact.

Beyond the literatures that focus on poverty, BOP scholars can learn from insights stemming from broader theories and research streams. In particular, the literature on cross-sector partnerships can contribute insights on managing relationships among firms, NGOs, and governments; recent publications have started to create bridges between cross-sector partnership studies and the BOP (e.g. Rangan, Chu, & Petkoski, 2011; Rivera-Santos et al., 2012). More broadly, theories and concepts from international business can contribute insights on international market entry, strategic management can contribute insights on low-end market penetration, and marketing can contribute insights on market segmentation.

The preceding comments are meant to be initial suggestions for cross-fertilization in future research building on the body of knowledge accumulated in recent years in different fields. While it may remain a challenge to publish in the top mainstream academic journals, the authors hope that this article will incite and help scholars interested in the BOP to pursue the investigation of the topics discussed in this review, as they are highly relevant for both the research and the practice in the field of business and society.

¹ The one article in Chinese was coded by the authors of this study with the help of an assistant fluent in Chinese; all other articles were analyzed by the authors themselves directly from the original language of publication.

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Figure 1
Organizing Framework

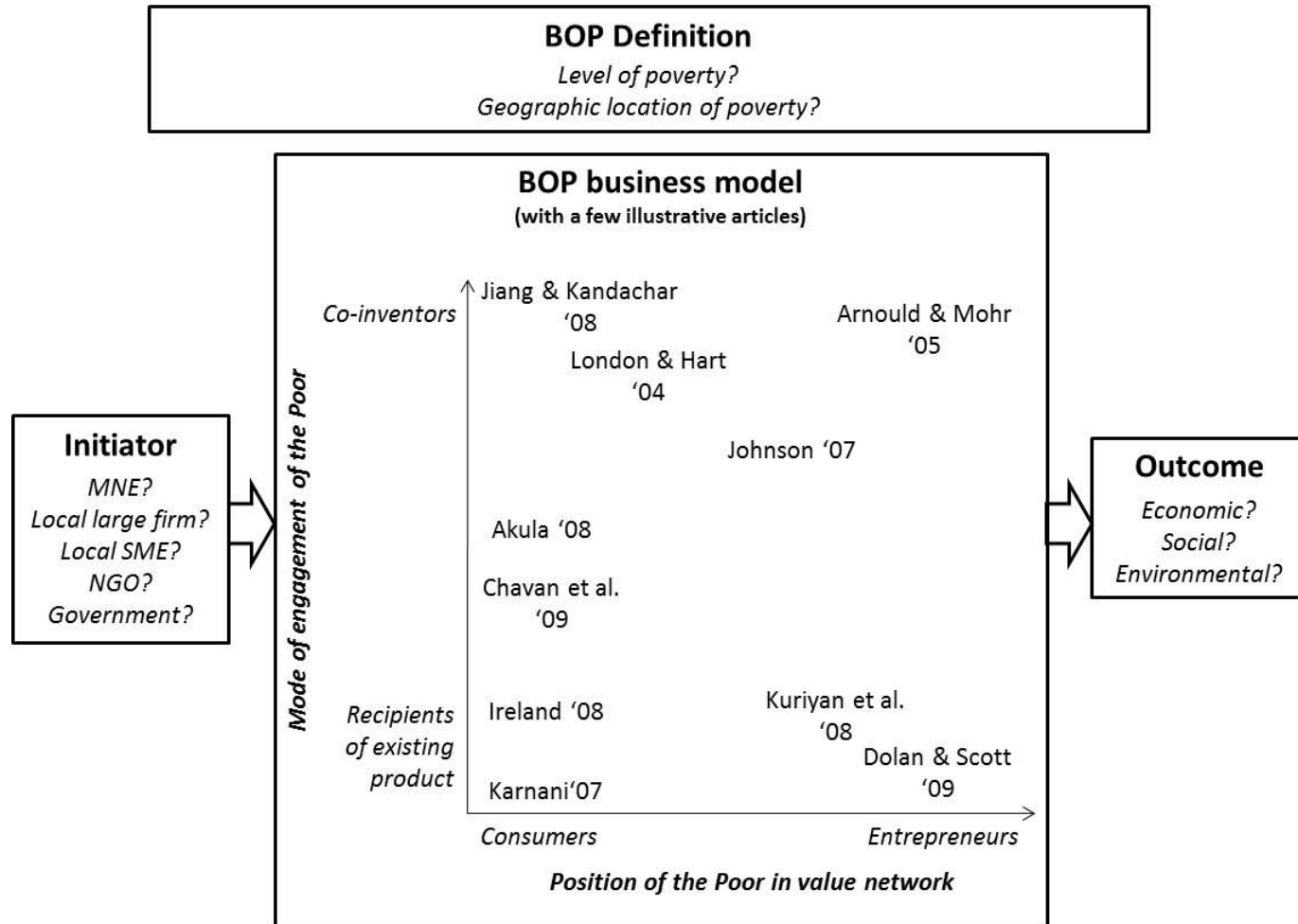


Figure 2
Number of Published BOP Articles

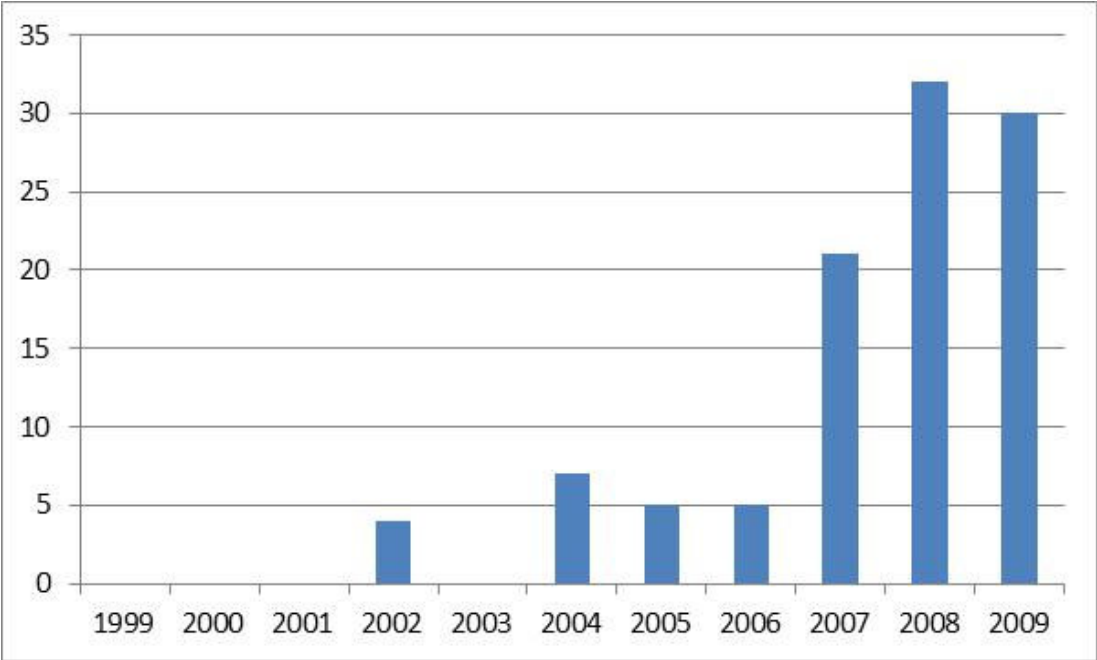
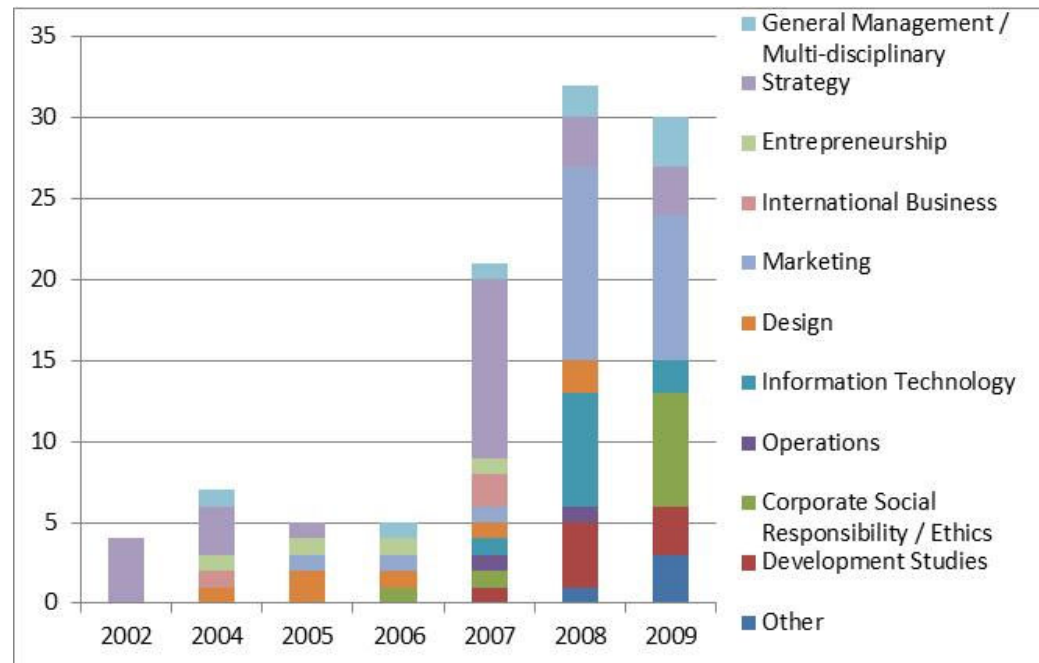


Figure 3
Primary Disciplinary Focus of BOP Articles



"Other" includes: Anthropology - 1 (2009) / Education - 1 (2007) / Public health - 1 (2009) / Finance - 1 (2009)

Figure 4
Methodology of BOP Articles

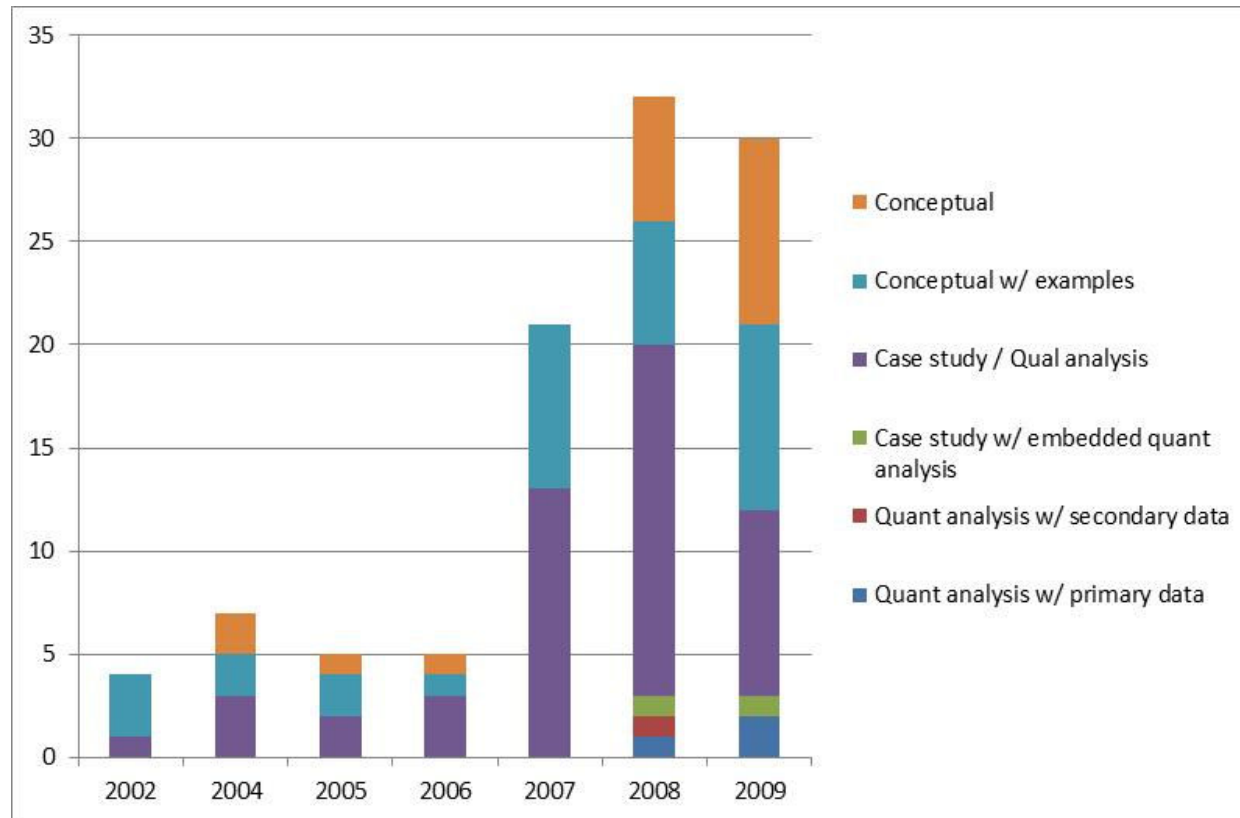
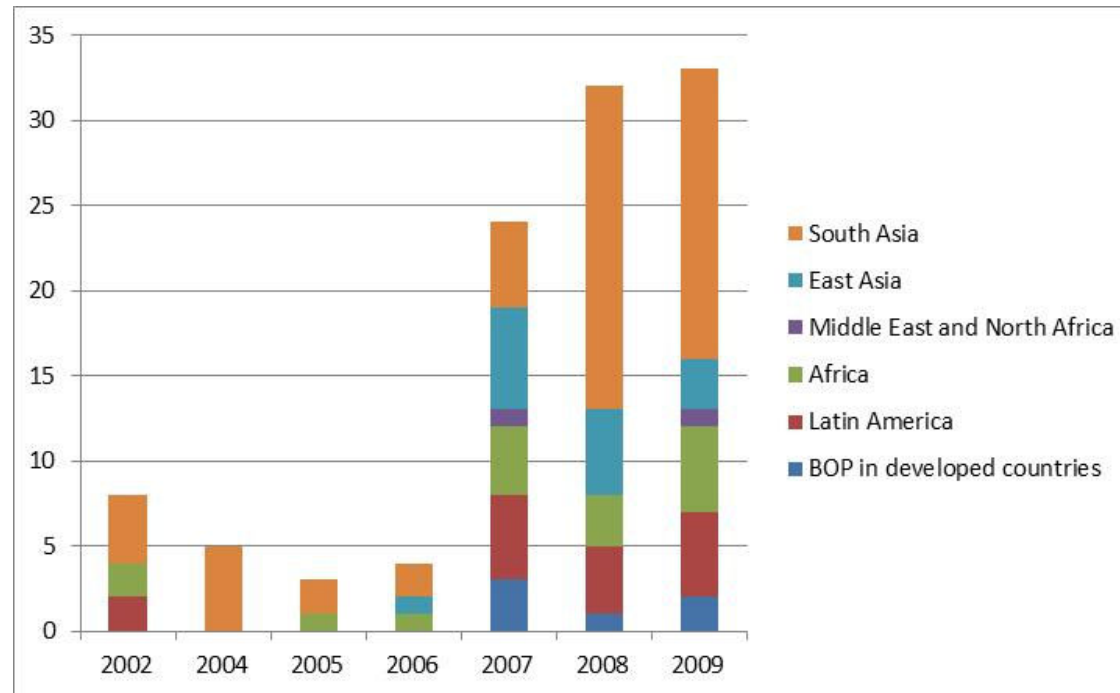
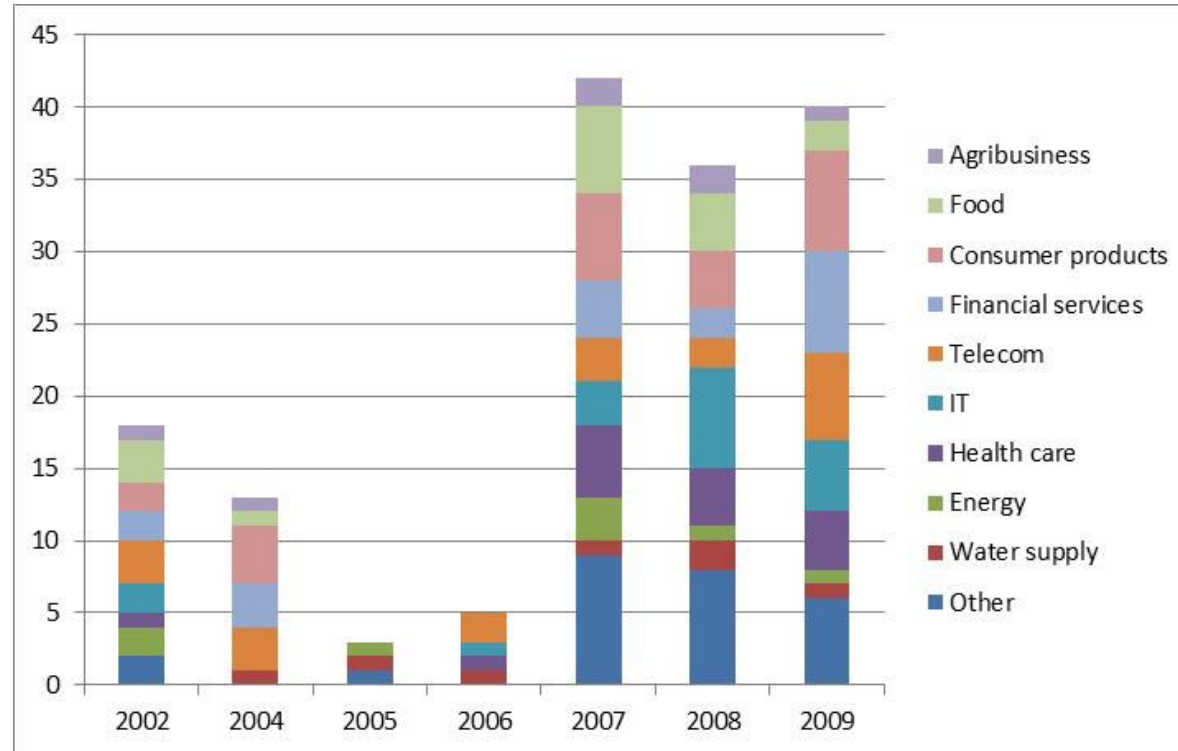


Figure 5
Geographic Origin of Illustrations in BOP Articles



The total number of examples differs from the total number of papers, because (1) some papers do not cite examples and (2) some papers cite several examples

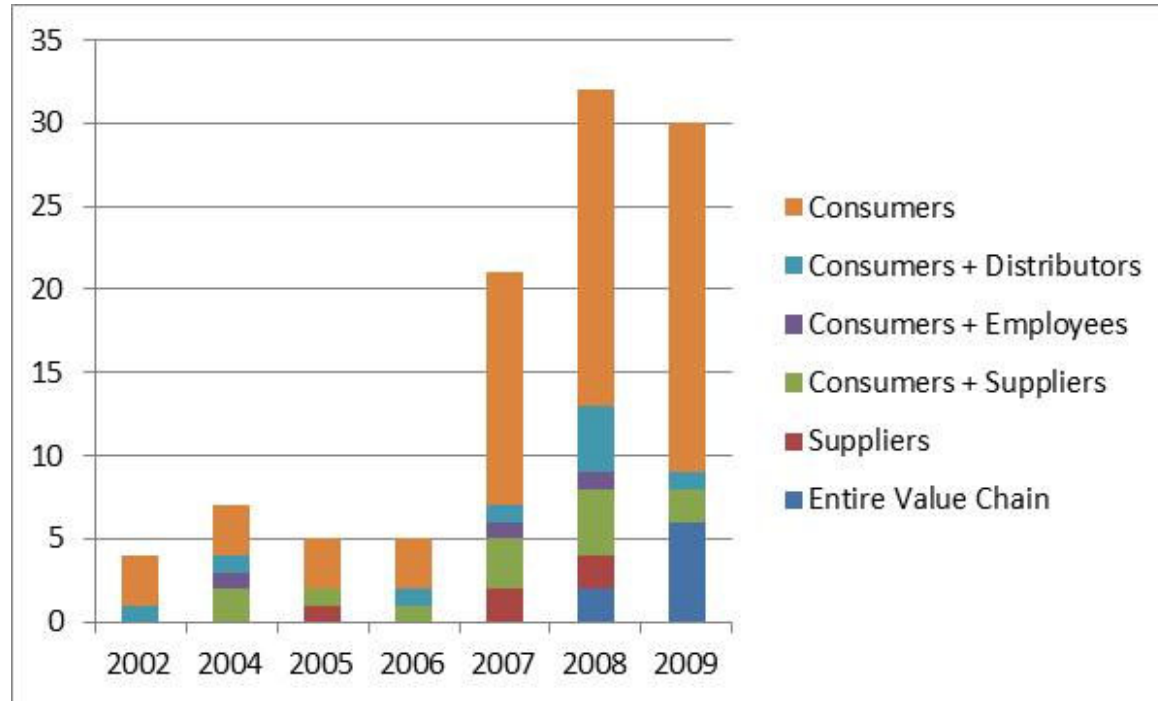
Figure 6
Industry Origin of Illustrations in BOP Articles



The total number of examples differs from the total number of papers, because (1) some papers do not cite examples and (2) some papers cite several examples

The category 'Other' includes industries cited less than 5 times in the literature: Automobiles (1); Chemicals (3); Clothing (4); Construction material (4); Education (3); Home appliances (1); HRM (1); Liquor (1); Logistics (2); Market research (1); Public libraries (1); Retailing (2); Tourism (1); Waste management (1)

Figure 7
The Position of the Poor along the Value Chain in BOP Initiatives



Appendix
List of Articles Included in the Review
(see reference list for full citations)

1. Hart, S. L. and C. Christensen (2002)
2. Prahalad, C.K. (2002)
3. Prahalad, C. K. and A. Hammond (2002)
4. Prahalad, C. K. and S. L. Hart (2002)
5. Ahmad, P. S., M. E. Gorman, et al. (2004)
6. Curtis, R. (2004)
7. Hammond, A. L. and C. K. Prahalad (2004)
8. London, T. and S. L. Hart (2004)
9. Medard, G. (2004)
10. Ricart, J. E. J. R., M. J. M. E. Enright, et al. (2004)
11. Whitney, P. and A. Kelkar (2004)
12. Arnould, E. and J. Mohr (2005)
13. Hart, S. L. (2005)
14. Nebelung, M. and A. Jazayeri (2005)
15. Prasad, V. C. S. and V. Ganvir (2005)
16. Sethia, N. (2005)
17. Blake, J. (2006)
18. Chesbrough, H., S. Ahern, et al. (2006)
19. Hart, S. L. (2006)
20. Jiang, J.-H., Z.-Z. Yan, et al. (2006)
21. Kirchgeorg, M. and M. I. Winn (2006)
22. Anderson, J. and C. Markides (2007)
23. Anderson, J. and N. Billou (2007)
24. Ang, R. P. and J. A. Sy-Changco (2007)
25. Brugmann, J. and C. K. Prahalad (2007)
26. Cai, J., D. Yang, et al. (2007)
27. Danse, M. and S. Vellema (2007)
28. Gardetti, M. A. (2007)
29. Harjula, L. (2007)
30. Johnson, S. (2007)
31. Karnani, A. (2007a)
32. Karnani, A. (2007b)
33. Karnani, A. (2007c)
34. Márquez, P. (2007)
35. Martinez, J. L. and M. Carbonell (2007)
36. McFalls, R. (2007)
37. Prahalad, C. K. (2007)
38. Sánchez, P., J. E. Ricart, et al. (2007)
39. Seelos, C. and J. Mair (2007)
40. van der Vleuten, F., N. Stam, et al. (2007)
41. Vats, A. (2007)
42. Weiser, J. (2007)
43. Agarwal, S., D. Chakraborty, et al. (2008)
44. Akula, V. (2008)
45. Anderson, J. and M. Kupp (2008b)
46. Bhanji, Z. (2008)
47. Bhatia, T. K. and M. Bhargava (2008)
48. Brinkerhoff, J. M. (2008)
49. Guesalaga, R. and P. Marshall (2008)
50. Heeks, R. (2008)
51. Ireland, J. (2008)
52. Jiang, J.-H. and P. Kandachar (2008a)
53. Jiang, J.-H. and P. Kandachar (2008b)
54. Jose, P. D. (2008)
55. Karnani, A. (2008a)
56. Karnani, A. (2008b)
57. Kuriyan, R., Ray, I., & Kammen, D. (2008)
58. Kuriyan, R., Ray, I., & Toyama, K. (2008)
59. Levy, M. R., & Banerjee, I. (2008)
60. Mutis, J. and J. E. Ricart (2008)
61. Nielsen, C. and P. M. Samia (2008)
62. Perez-Aleman, P. and M. Sandilands (2008)
63. Pitta, D. A., R. Guesalaga, et al. (2008)

64. Sarabhai, K. V. (2008)
65. Schwittay, A. (2008)
66. Simanis, E., S. Hart, et al. (2008)
67. Sinha, M. (2008)
68. Sreekumar, T. T. and M. Rivera-Sanchez (2008)
69. Sridharan, S. and M. Viswanathan (2008)
70. Subrahmanyam, S. and J. T. Gomez-Arias (2008)
71. Vachani, S. and N. C. Smith (2008)
72. Van den Waeyenberg, S. and L. Hens (2008)
73. Viswanathan, M., S. Gajendiran, et al. (2008)
74. Wood, V. R., D. A. Pitta, et al. (2008)
75. Altman, D. G., L. Rego, et al. (2009)
76. Chavan, A. L., S. Arora, et al. (2009)
77. Cross, J. and A. Street (2009)
78. da Rocha, A. and J. F. da Silva (2009)
79. Davidson, K. (2009)
80. De Angoitia, R. and F. Ramirez (2009)
81. Dolan, C. and L. Scott (2009)
82. Esqueda, S. and L. Hernández (2009)
83. Hahn, R. (2009)
84. Hahn, R. and G. R. Wagner (2009)
85. Karnani, A. (Karnani, 2009b)
86. Kuriyan, R. and I. Ray (2009)
87. Lakshman, C. (2009)
88. Liao, N. (2009)
89. London, T. (2009)
90. Luce, R. A. (Luce, 2009)
91. Muuka, G. N. and M. M. Choongo (2009)
92. Olsen, M. and E. Boxenbaum (2009)
93. Omar, M. and R. L. Williams (2009)
94. Peukert, J. and T. Fuggenthaler (2009)
95. Rajagopal, S. (2009)
96. Rashid, A. T. and M. Rahman (2009)
97. Schwittay, A. (2009)
98. Simanis, E. and S. L. Hart (2009)
99. Tashman, P. and V. Marano (2009)
100. Viswanathan, M. and S. Sridharan (2009)
101. Viswanathan, M., A. Seth, R. Gau and A. Chaturvedi (2009)
102. Viswanathan, M., S. Sridharan, R. Gau and R. Ritchie (2009)
103. Webb, D., N. Kristiani, et al. (2009)
104. Zala, L. N. and N. R. Patel (2009)