

The innovation process in emerging economies

An effectuation perspective

David Lingelbach, Ven Sriram, Tigineh Mersha and Kojo Saffu

Abstract: *The authors investigate the impact of two contrasting logics, effectuation and causation, on the innovation process in emerging economies (EEs). Effectuation theory, which emphasizes responses to uncertainty, is integrated with the innovation process literature, which emphasizes resource constraints. In particular, the authors show that in EEs the flexibility dimension of effectuation is underemphasized, while its pre-commitment dimension is overemphasized. The combination of effectuation and causation mechanisms is influenced by the industry context, as well as by the type, degree and timing of resource constraints. Employing longitudinal data from six innovation process cases across one industry (financial services) and four EEs (Botswana, Ethiopia, Ghana and South Africa), the authors employ a process approach using real-world data to support their propositions.*

Keywords: *innovation process; effectuation; emerging economies*

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In March 2007, Safaricom – Kenya’s largest mobile telephone company and one of Africa’s innovation successes – launched a financial services product called M-PESA (Swahili for mobile cash). The product allowed Safaricom customers to transfer funds to other mobile phone users without using a bank account. M-PESA is now used by 70% of Kenya’s adult population and transfers 25% of that country’s gross domestic product (GDP) each year, providing access to finance for millions of individuals and small businesses (*Economist*, 2013).

M-PESA is an example of a product innovation originated in the emerging economies (EEs).¹ How are such innovations developed, and is the innovation process different from that found elsewhere? To answer these questions, most existing literature has focused on

EE resource constraints (Cunha *et al*, 2013) and identified bricolage-related innovation mechanisms (Garud *et al*, 2013) variously described as reverse (Govindarajan and Trimble, 2012), frugal (Zeschky *et al*, 2011), *jugaad*² (Radjou *et al*, 2012) or *kanju*³ (Olopade, 2014). Such mechanisms are relevant to firms in resource-scarce environments (Fisher, 2012; Valliere and Gegenhuber, 2014), such as those found in many EEs.

While bricolage-related mechanisms are significant in resource-constrained EEs, they may not be the only mechanisms influencing how the innovation process unfolds. Effectuation theory has also been studied as an influence on the innovation process (Brettel *et al*, 2012; Berends *et al*, 2014). Effectuation theory posits two contrasting decision-making logics: effectuation and causation. Effectuation has been defined as a decision-

making process used by expert entrepreneurs under conditions of uncertainty that takes a set of means – such as attributes, knowledge, networks and financial resources – as given and focuses on selecting possible outcomes – such as new products or ventures – that can be created from those means.

A contrasting logic is causation, which is applied under conditions of predictability. Causation takes outcomes as given and focuses on selecting between means to create them (Saravathy, 2001, 2008). Confirming an earlier variance study of USA-based consumer Internet start-ups (Fisher, 2012), Berends *et al* (2014) found in a process study of small Dutch firms that both of these logics were present in the innovation process. Given higher levels of resource constraint in EEs, how does the innovation process unfold in conjunction with effectuation and/or causation logics?

Focusing on this key question, we argue that, given the substantially higher resource constraints facing many EE innovators versus those in developed economies, effectuation is likely to have a different impact on the innovation process from what is seen in those settings. In essence, we advocate a *holistic* perspective that better integrates effectuation theory with the innovation process literature by employing EE data to complement insights from earlier studies in developed economies. This article thus responds to calls issued by Garud *et al* (2013) for more research on how the innovation process changes from one cultural context to another, as well as to calls to extend effectuation research further into the innovation research stream (Brettel *et al*, 2012; Berends *et al*, 2014), and more generally, to extend the study of the innovation process to rapidly changing EE contexts such as Africa (Mitra and Sagagi, 2013).

We develop our propositions by employing a process research methodology drawing on six case studies of the innovation process in the financial services sector from Botswana, Ethiopia, Ghana and South Africa. These EEs were selected because they show substantial variation in resource scarcity and institutional quality, both between one another and in comparison with the principal contexts for much innovation process research to date: the USA and Europe. EE financial innovation has become increasingly significant (Morduch, 1999; Elaydi and Harrison, 2010; Van der Boor *et al*, 2014), and the focus on one industry helps to control for industry effects while providing a contrast to earlier studies that concentrated on technology-enabled (Fisher, 2012) or product (Berends *et al*, 2014) innovations. Moreover, service firm innovation, such as financial innovation, differs significantly from manufacturing innovation (Berends *et al*, 2014).

Overall, this article makes six contributions. First, we

enrich the innovation process literature by providing a more fine-grained analysis of the relationship of effectuation theory to the innovation process in the EE context. Our propositions suggest that one dimension of effectuation shared with causation – co-creation through pre-commitments with stakeholders – is overemphasized in this context, while another dimension – flexibility – is underemphasized. Second, we argue that the combination of effectual and causal mechanisms in the innovation process depends in part on the institutional and industry contexts. Third, we demonstrate that the mix of effectuation and causation in the innovation process depends in part on the degree and type of the resource constraint, as well as changes in that constraint over time. Fourth, by amassing case data from four diverse but relatively underexplored countries in a region often overlooked by entrepreneurship and innovation scholars (Acs *et al*, 2013) and one industry infrequently considered in the innovation process and effectuation literatures, we extend the geographic and industry reach of both. Fifth, we employ a process research approach, which, while relatively common in innovation research, has been used only once in studies of effectuation (Berends *et al*, 2014). Sixth, we study effectuation in a real-life setting, as opposed to the experimental setting in which it was originally developed. Only a few studies have validated effectuation theory in actual organizations (for example, Saravathy and Dew, 2005; Berends *et al*, 2014).

Theoretical background

This study seeks to investigate the EE innovation process through two contrasting theoretical lenses: effectuation and causation. In this section, we situate our study in two past literatures: the innovation process under resource constraints, and effectuation theory, which describes the contrasting effectuation and causation logics.

The innovation process under resource constraints

The innovation process begins with invention (the emergence of a novel idea), continues with development (the elaboration of that idea) and concludes with implementation (the widespread acceptance of that idea) (Van de Ven *et al*, 1999). This process is fraught with complexity along four dimensions: evolutionary, relational, temporal and, most relevant for this study, cultural. Cultural complexity has been defined as ‘different cultural contexts hav[ing] their own practices, values and discourses that drive innovation’ (Garud *et al*, 2013, p 797). Innovations in one cultural setting may be differently invented, developed or implemented in another setting (Van de Ven, 2004). Cultural complexity

affects the earlier stages of the innovation process: invention and development. In describing EE innovation practices such as *jugaad* (Radjou *et al.*, 2012) or *kanju* (Olopade, 2014), the literature emphasizes bricolage (Baker and Nelson, 2005) as the most likely mechanism for EE innovators as they invent and develop new products and services under resource constraints (Garud *et al.*, 2013). These studies tend to conflate cultural complexity, such as that found in many EEs, with resource scarcity, which is also found in these settings, but which may operate differently on the innovation process from the way in which cultural complexity would.

One explicit study of the innovation process under resource constraints found that effectuation theory had a significant impact on how the innovation process unfolded. Resource-constrained small firms used effectuation logic early in the innovation process, but causation logic was increasingly used in the later stages. These findings were contrasted with the findings of the new product development (NPD) literature, which has typically found that large, established firms with fewer resource constraints employ causation logic in the innovation process (Berends *et al.*, 2014). These conclusions were echoed in an earlier study of EE financial innovation, which found that innovation strategy could shift over time (Elaydi and Harrison, 2010).

Effectuation theory

Effectuation has been identified as a theoretical perspective with relevance to the study of innovation (Dew *et al.*, 2008; Fisher, 2012; Brettel *et al.*, 2012; Berends *et al.*, 2014). Effectuation theory focuses on the contrasting decision-making logics or cognitive processes employed by managers and entrepreneurs: causation and effectuation. It emphasizes the creation of entrepreneurial artefacts through a process that is constructed (effectuation), as opposed to the traditional planning-oriented process rooted in rationality and emphasizing the discovery of opportunities (causation).

Effectuation theory assumes that, when employing effectuation, entrepreneurs face an uncertain, dynamic and non-linear external environment, while managers, when utilizing causation logic, encounter a predictable environment. Effectuation theory argues that effectuation is more common in human action, depends more on the characteristics of actors than on the outcomes they are attempting to generate (such as new products) and focuses on control in the face of uncertainty (Sarasvathy, 2001). Thus, effectuation processes are more likely to be seen in uncertain environments, while causation processes are more likely in predictable environments (Fisher, 2012).

The effectuation process is a multidimensional

formative construct consisting of three independent dimensions: experimentation, affordable loss and flexibility. Effectuation shares one dimension with causation: pre-commitment. However, effectuation and causation processes employ pre-commitments for different reasons (Chandler *et al.*, 2011). Because these dimensions are independent of one another, they operate separately from one another. This suggests that these dimensions may influence different stages of the innovation processes in different ways and to differing degrees.

Effectuation and bricolage share four similarities: existing resources as the basis for opportunity generation, action as a means of overcoming resource constraints, community as a catalyst for new venture development, and resource constraints as a stimulus for innovation (Fisher, 2012). Effectuation theory focuses on uncertain environments that may or may not be resource-constrained, while bricolage focuses on resource-constrained environments that may or may not be uncertain. Thus, introducing effectuation theory into the innovation process conversation may complement this bricolage-focused literature.

Effectuation theory suffers from three limitations. First, effectuation was developed to explain how *expert* entrepreneurs succeeded. These experts launched and exited from more than one large and successful new venture. Hence, effectuation describes a very small percentage of entrepreneurial behaviour in most settings, and almost none of the innovative behaviour in EEs. Most innovators in these settings remain small and may never launch more than one business. By contrast, effectuating innovators seem more likely to have launched more than one new venture. Second, studies that have validated effectuation theory have relied heavily on data drawn from specific technology-enabled industries, such as electrical measurement instruments and surgical and medical instruments (Chandler *et al.*, 2011) and consumer Internet start-ups (Fisher, 2012). Effectuation theory may be applied differently in various industry settings. Consequently, we have cause for caution in examining whether innovation emerging from the EE context will fit the effectuation template, or whether non-technology industries in these settings will apply effectuation to the innovation process in the same way that they would in technology-enabled industries. In particular, it seems possible that effectuation logic may be implemented somewhat differently in these contexts from elsewhere. Third, in comparison with other possible mechanisms of entrepreneurial action, of which bricolage is most prominent, effectuation theory initially relied heavily on experimental data, rather than the real-world data on which competing theories such as bricolage are largely built.

Methods

To examine how the innovation process unfolds in EEs in conjunction with effectuation and/or causation logics, we adopted a process research approach, investigating EE innovation as ‘a sequence of events or activities that describe how things change over time’ (Van de Ven, 2007, p 197). Longitudinal studies of EE innovation are used to ‘depict the evolution of actual processes in their natural environment’ (Berends *et al*, 2014, p 620). By using multiple data collection methods to ‘examine a contemporary process in depth’ (Langley *et al*, 2013, p 6), our study followed best practices for process research. Our findings were also cross-validated using this mixed methods approach (Langley, 1999), while the use of multiple homogeneous but independent EE innovation trajectories helped to corroborate our findings (Yin, 2003). We investigated six EE firms, in line with Eisenhardt’s (1989) guidance that 4–10 organizations are typically sufficient to establish replication.

In order to account for earlier findings that effectuation and causation logics coexist, we employed an alternate templates research strategy as part of our process research approach. As argued in Langley (1999), an alternate template strategy allows for the combination of theoretical perspectives to provide a more accurate explanation of a phenomenon that is both relatively simple and generalizable. Similar to ‘pattern matching’ strategies in case research (Yin, 2003; Langley, 1999), this strategy allowed us to utilize a relatively small number of cases to generate a wide base for comparison – thus creating more degrees of freedom – and necessitated collecting different types of data, thereby increasing the richness of our study and its findings.

Sampling, data collection and sources

Given the process research approach of our study, we have opted for longitudinal case studies (Eisenhardt, 1989), with ventures as the unit of analysis. We selected our sample of six financial innovations from a population of 12 EE-originated financial innovations in the framework of a broader research project on EE entrepreneurial finance. This population includes well known financial innovations such as microfinance, mobile payments and Islamic finance, as well as less studied innovations, and was selected from a previous literature review on EE entrepreneurial finance (Lingelbach, 2012). These 12 innovations were initially selected to reflect varied institutional contexts including innovations from emerging Europe, Asia and Sub-Saharan Africa.

We arrived at this sample based on two criteria. First, we chose nine ventures that originated from Sub-

Saharan Africa. A key advantage of using this criterion was that we chose financial innovations that were exposed to a common institutional endowments and infrastructure development (Hoskisson *et al*, 2013). Second, we concentrated on an in-depth study of six of the nine innovators because these ventures provided the researchers with access to observe their innovation processes and also the opportunity to interview multiple informants over a period of four years.

The financial innovations we studied were Business Partners and Bioventures (South Africa); Ayat and Nib (Ethiopia); Venture Partners Botswana (Botswana); and a butcher (Ghana). Business Partners (BP) is a private–public SME finance organization founded in Johannesburg in 1981 by Anton Rupert to provide financing and related services to local SMEs that could not access bank finance. Bioventures is a biotechnology venture capital (VC) fund established in Cape Town in 2001 by Heather Sherwin to provide equity capital to biotechnology-oriented local start-ups. Ayat is a residential real estate development firm founded in Addis Ababa in 1996 by Ayalew Tessema to build and sell affordable housing through its innovation–customer-financed development, which was unique in the local market. Nib was founded in Addis Ababa in 1999 by a group including Amerga Kassa to provide commercial banking services. Its innovation consisted of a private share placement, one of the first in that country. Venture Partners Botswana (VPB) is a private equity and VC fund managed by a private firm and utilizing government investment capital. It was established in Gaborone in 2002 by Anthony Siwawa to increase the level of start-up and small business activity through equity and debt financing. The butcher’s venture was established in northern Ghana in 1984. Its innovation consisted of providing financing to rural cattle farmers to expand their herds. Case descriptions are provided in Table 1.

Data were collected during a four-year period (July 2007 to June 2011) from two sources: semi-structured interviews and archival documents. Given the differences in the countries and their environments, and the variation in the sophistication of the financing options available, data were collected in each country in a way that reflected these differences. Thirty interviews with a total duration of approximately 68 hours were conducted, of which one interview was conducted in Botswana by a local academic (who is not one of the co-authors). Nineteen of these interviews were either with the case study target or its investors and/or investees. The remaining 11 interviews were with informed industry observers with direct knowledge of the case target. For five of the six cases, we interviewed the principal decision maker at least twice over the data collection period, which allowed us to capture the

Table 1. Description of cases.

More resource-constrained		
Nib International Bank, Ethiopia 2013 GDP/capita (PPP) = \$1,300 Innovation: private share placement Interviews = 2 Archival pages = 200 Article pages = 104	Ayat Real Estate Development, Ethiopia 2013 GDP/capita (PPP) = \$1,300 Innovation: customer-financed residential real estate development Interviews = 2 Archival pages = 0 Article pages = 65	Butcher, Ghana 2013 GDP/capita (PPP) = \$3,500 Innovation: financing customer cattle herd expansion Interviews = 4 Archival pages = 0 Article pages = 0
Less resource-constrained		
Bioventures, South Africa 2013 GDP/capita (PPP) = \$11,500 Innovation: biotechnology-oriented VC fund Interviews = 6 Archival pages = 349 Article pages = 52	Venture Partners Botswana, Botswana 2013 GDP/capita (PPP) = \$16,400 Innovation: VC and private equity finance to start-ups and SMEs Interviews = 3 Archival pages = 11 Article pages = 17	Business Partners, South Africa 2013 GDP/capita (PPP) = \$11,500 Innovations: public-private partnership, royalty-based equity financing, 'beehives' (incubator predecessor) Interviews = 2 Archival pages = 932 Article pages = 1,496

Source: GDP/capita (PPP) data – Central Intelligence Agency (2015).

development of the innovation. The bulk of these interviews were face-to-face and conducted with key decision makers at each innovator, as well as with investors, investees, competitors, industry association executives and government officials. A semi-structured interview template was utilized for each interview. Consistent with established practice (Rubin and Rubin, 2005; McCracken, 1988; Stewart, 1998), this template consisted of a few open-ended questions such as 'Tell us how your organization got started' and 'What's the history of the industry of which you are a part?' We chose not to ask more directive questions about either innovation or the different theoretical template elements, as we aimed for data to emerge organically from the interviewees' responses. Field notes were taken by one author during each interview, and these were transcribed to correct for any errors immediately thereafter. These transcribed notes comprised both observation and analysis, as proposed by Eisenhardt (1989).

Consistent with best practice process research, we acquired the necessary 'interactional expertise' in three ways. First, one author conducted an initial pilot field study in South Africa in 2007 to study financial innovation processes, before commencing this study. Second, another author has over 20 years of experience in financial services, including in EEs, and was thus able to relate to the specialists we interviewed and interpret their reports. Third, three of our four authors were born, raised and educated in EEs, including two in Sub-Saharan Africa, enabling us to interpret more fully the data that emerged as this study proceeded and to balance insider and outsider perspectives, 'combining intimacy with local settings and the potential for distancing' (Langley *et al.*, 2013, p 6).

Archival documents consist of annual reports,

placement memoranda, board minutes, a case study (Emerson and McCallick, 2014) and a biography of one founder (Dommissie, 2005; approximately 1,503 pages), as well as newspaper articles (1,734 articles of approximately one page each, identified via a Lexis-Nexis search of the firm and its founder) and the innovators' websites. These documents were reviewed for the South African, Botswanan and Ethiopian cases, but were not available for the Ghanaian case. As was to be expected, data quality and quantity varied significantly by case, with Business Partners and Bioventures being the richest sources of data and the Ghanaian butcher the least rich source.

Data analysis

Once data had been collected, we developed case histories for each of the innovators being examined. We focused on capturing the key decisions that each made as their respective innovations were developed. Each case history was between 4,000 and 6,000 words long. A central part of each case was the development of an event sequence file (Poole *et al.*, 2000) that visualized critical incidents and the presence of effectual or causal behaviours at each event. One author distinguished events in the innovation process for each case and discussed these with other authors until a consensus was reached on event identification. For each event, authors recorded the date of occurrence, the event, the actors involved, the action's effect and the reasons for the actions taken, maintaining a chain of evidence (Yin, 2003). When possible, these files were shared with interviewees for validation and correction, resulting in a few minor changes. The resultant sequences ranged from 14 to 29 events, focused on strategic decisions within the innovation process, and were therefore

somewhat fewer in number than in other recent process studies (for example, Berends *et al*, 2014). Figures 1–3 summarize these event sequence files for Business Partners, Bioventures and VPB respectively.⁴

After each case had been developed independently by one of the authors, we compared them and identified inconsistencies that were then corrected by re-examination of source data or further interviews. We then sought to match the data in each case to the behaviours associated with each theory. To do so, we developed templates for effectuation and causation based on Chandler *et al* (2011) and Fisher (2012). The templates consisted of approximately the same number of factors: seven for effectuation and nine for causation.

Following the development of the theoretical templates, we then coded each case, using these templates as a guide, in order to identify the extent to which each case displayed attributes of effectuation, causation or neither of these models. The strength of fit between the case data and the theory was assessed as strong if (1) the behaviour captured in the case study matched the behaviour associated with the theory as reflected in the template, and (2) the data in the case were clear and unlikely to be contested by someone else reading the same information. While the author responsible for each case did the initial coding independently, all coding was discussed with all authors (and, if necessary, revised) to arrive at a consensus about the nature of the innovation process in each case. Any inter-coder inconsistencies were largely resolved through lengthy discussion and subsequent agreement, resulting in an inter-rater reliability of 97.8%. As with deductive hypothesis testing, the case evidence fitted a consistent pattern, though it did not always conform perfectly (Eisenhardt, 1989). The analysis of the case study data using the various theoretical perspectives provides the foundation for comparing and contrasting the behaviours underlying each theory and for identifying themes. To draw conclusions from the analysis, we observed patterns in the data summarized in Table 2 and Figures 1–3.

Analysis and results

The data show that innovators employ a combination of causal and effectual mechanisms in the EE innovation process. All six EE innovation processes demonstrated behaviours that fitted in varying degrees with effectuation processes. Chandler *et al* (2011) identified four such processes – experimentation, affordable loss, flexibility and, in common with causation, pre-commitments. In our case studies, a majority of these factors were present in all six cases, suggesting a strong fit with effectuation. Effectuation was utilized under conditions of both higher and lower economy-wide resource

constraints. Two of these processes – affordable loss and pre-commitment (shared with causation) – were observed in all cases, as was one element of the flexibility process (adaptation to available resources). On the other hand, another element of flexibility – responding to unplanned opportunities as they arose – was not observed in three of the six cases. These results are summarized in Table 2.

The impact of effectuation on the EE innovation process

The Business Partners innovation process provided the strongest evidence for effectuation logic, with all seven factors present at various stages of the process. Unlike some of the other cases we studied, BP's innovation process was complete, proceeding from invention to development and implementation. BP's innovation process is also the only example of serial innovation amongst our cases. Its first innovation – private/public ownership of an SME finance organization – was new to the South African market when BP was established in 1981. Its second innovation – 'beehives' – enabled black African entrepreneurs during apartheid to operate their businesses outside of townships and 'bantustans'⁵ by leasing space with other entrepreneurs from BP-owned facilities in white areas. BP's third innovation – royalty-based equity financing – addressed a common problem of 'lifestyle' SMEs: the founder's inability to make significant equity contributions when growth capital is required.

How did BP's strong utilization of effectuation mechanisms affect its innovation process? As BP invented, developed and implemented its innovations over time, it employed differing mixes of effectuation mechanisms.

During its first invention phase (1979–81), BP's idea of a public/private SME finance organization emerged as a flexible (effectual) response to its founder's receipt of unsolicited business plans from local entrepreneurs. The founder limited his initial investment in BP to Rand 5 million out of Rand 150 million initial capital (affordable loss limitation), seeking co-investment from public and private investors who shared a common vision (pre-commitment). The founder employed co-investment both to maintain initial flexibility and to reduce uncertainty, evidence that pre-commitments are being used effectually, as well as to acquire essential resources, evidence of causation logic (Chandler *et al*, 2011).

From its inception, BP found itself at the centre of South Africa's entrepreneurship community. This position enabled it to form partnerships with a variety of private and public stakeholders, practising effectual pre-commitment in order to maintain its initial flexibility. One BP informant described this position as follows:

Table 2. Summary of evidence on effectual and causation behaviours.

Effectual behaviours	Venture Partners Botswana	Nib International Bank	Ayat Real Estate Development Enterprise	Butcher financing rural smallholder cattle farmers	Business Partners	Bioventures
<i>Experimentation</i>						
Developed multiple variations of a product	Yes	Yes	Yes	No	Yes	No
Experimented with different ways to sell and/or deliver the product	No	Yes	Yes	Yes	Yes	No
Changed the product substantially as the venture developed	Yes	Yes	Yes	No	Yes	No
<i>Affordable loss</i>						
Committed only limited resources to the venture	Yes	Yes	Yes	Yes	Yes	Yes
<i>Flexibility</i>						
Responded to unplanned opportunities as they arose	No	No	No	Yes	Yes	Yes
Adapted what they were doing to the resources at hand	Yes	Yes	Yes	Yes	Yes	Yes
<i>Pre-commitments</i>						
Entered into agreements with customers, suppliers and other organizations	Yes	Yes	Yes	Yes	Yes	Yes
Effectuation level	Strong	Strong	Strong	Strong	Strong	Moderate
<i>Causation behaviours</i>						
Identified and assessed long-term opportunities	Yes	Yes	Yes	Yes	Yes	Yes
Calculated the returns of various opportunities	No	Yes	Yes	No	Yes	Yes
Wrote a business plan	No	No	No	No	No	Yes
Organized and implemented control processes	Yes	Yes	No	Yes	Yes	Yes
Gathered and reviewed information about market size and growth	Yes	Yes	Yes	Yes	Yes	Yes
Gathered information about competitors and compared their offerings	No	Yes	Yes	Yes	Yes	Yes
Wrote up or verbally expressed a vision for venture	Yes	Yes	Yes	No	Yes	Yes
Developed a project plan to develop the product or service	Yes	No	No	No	Yes	Yes
Wrote up a marketing plan	No	No	No	No	No	Yes
Causation level	Moderate	Strong	Moderate	Weak	Strong	Strong

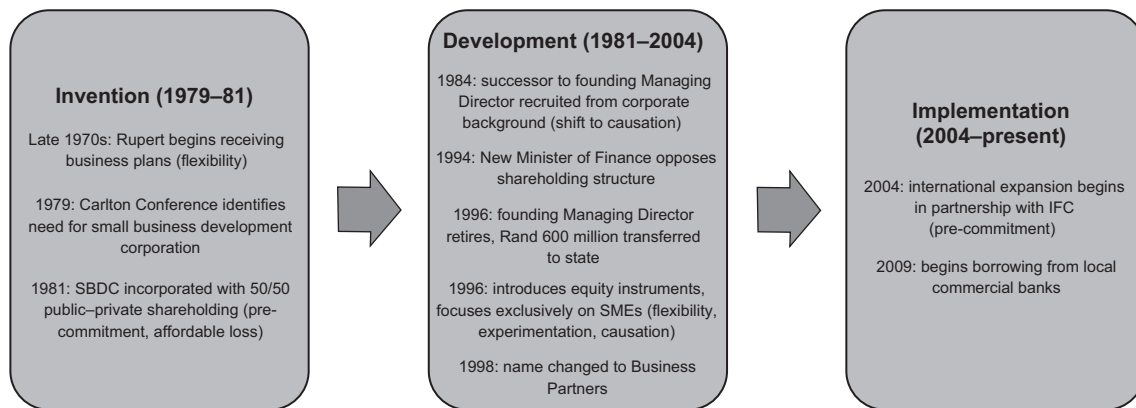


Figure 1. Summary event sequence file: the innovation process of Business Partners.

‘In 1986 the first attempt was made at establishing a VC association in South Africa. While this petered out by 1990, a second attempt was made in 1997. We were approached by the Department of Trade and Industry to spearhead this, based on our knowledge of all the key players. I served as the association’s first executive director.’

Rupert’s position as a leading Afrikaner business person with a sympathy for black Africans’ economic plight allowed him to form partnerships with a wide spectrum of partners. This was a relatively unusual skill set in South Africa at that time. This position enabled him to obtain financial commitments from both the South African government and other leading business people. Each of these parties had a different vision for the business. Combining these visions produced an innovative SME finance organization that neither challenged established financial institutions nor harmed government

interests, including in the post-apartheid era.

During the development phase of BP’s innovation process, Rupert’s vision was renegotiated with the South African government in the post-apartheid era in order to maintain a flexible response to emerging opportunities during that period (effectual pre-commitment). BP also began introducing equity instruments to its product portfolio as the post-apartheid economic landscape changed (experimentation). During the implementation phase of the innovation process, effectual pre-commitment continued to be a significant behaviour, as BP partnered with the International Finance Corporation (IFC) and other international investors to reduce uncertainty and maintain flexibility as it expanded its business model into other southern African economies.

The impact of causation on the EE innovation process

In contrast to Business Partners, the Bioventures innovation process case was the strongest example in

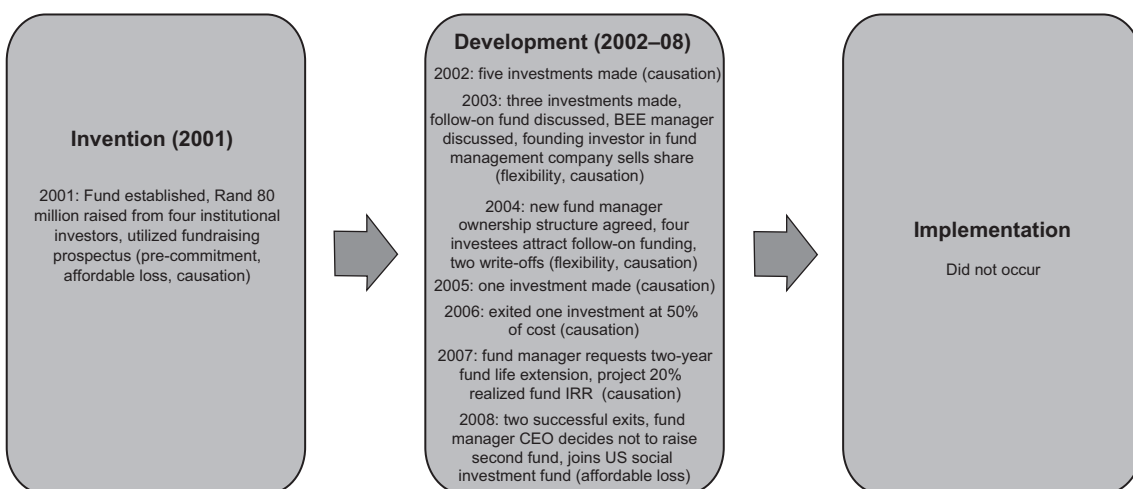


Figure 2. Summary event sequence file: the innovation process of Bioventures.

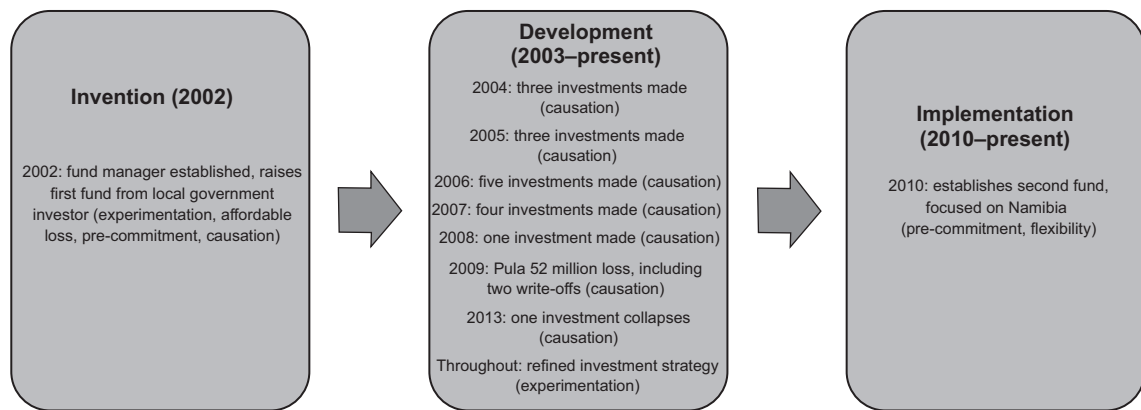


Figure 3. Summary event sequence file: the innovation process of Venture Partners Botswana.

our study of causation. Bioventures successfully invented and developed one innovation: biotechnology-focused VC. However, unlike Business Partners, it was unable to implement that innovation in the form of a second fund or by attracting competitors to launch funds with similar strategies. Figure 2 elaborates its innovation process.

During its invention phase (2001), Bioventures launched by raising funds using a prospectus, a common practice in VC fund management. That document committed it to a focused investment strategy by identifying long-term opportunities at attractive returns by making seed, start-up and early-stage investments in six biotechnology-related industries. This prospectus and related documents elaborated Bioventures's business plan. Each of these events indicated that a strong causal logic informed this phase.

As the Bioventures innovation process moved into the development phase (2002–08), the fund managers enacted control mechanisms typical of a well managed VC fund. For example, investment opportunities were screened, analysed and structured in accordance with industry recipes from South Africa, Europe and the USA. An active board of directors approved investments and provided oversight of the fund as it developed. During this development phase, the fund manager also monitored the development of the South African VC and biotechnology markets, their growth prospects and any potential competition. While various government-controlled biotechnology funding mechanisms did emerge during this period, they functioned as complements to the Bioventures investment strategy, rather than challenging it. Each of these events confirms that causation thinking continued to inform Bioventures's innovation process during this phase. The fund manager decided not to raise a second fund and chose to leave the industry, so an implementation phase in this process never materialized.

Like Business Partners, stakeholder pre-commitments were an important influence on Bioventures's innovation process. However, pre-commitment in this case was employed mainly to acquire investment funds as an essential resource and to implement the plan elaborated in the prospectus, both causation behaviours. A secondary consideration of these pre-commitments related to effectuation was to reduce uncertainty by, for example, partnering with powerful local and international investors.

Bioventures pre-commitments frayed as the innovation process attempted to move towards the implementation phase. First, its stakeholders' varying objectives began to overwhelm the fund's requirement to generate attractive risk-adjusted returns, and these objectives also shifted significantly after the fund was launched. Both events complicated Bioventures's ability to plan effectively. One investor became much more conservative and less VC-friendly as a result, while another's change in ownership resulted in a loss in political usefulness to Bioventures. These events complicated the firm's ability to raise a second fund.

The frustration of this situation was demonstrated by this comment from the fund manager:

'I can see the next wave of opportunities coming, but we punish failure in this society. And no one dares to cross government, who are the only investors in our industry at the moment. So I'll probably look abroad for my next venture.'

Combining effectuation and causation in the EE innovation process

Both Business Partners and Bioventures are extreme cases of the impact of effectuation and causation respectively on the EE innovation process. Yet, as Table 2 indicates, all of our cases showed evidence of employing both effectuation and causation in their innovation

processes. This finding was predicted theoretically (Sarasvathy, 2001) and has been confirmed empirically in non-EE contexts (Berends *et al*, 2014). Venture Partners Botswana (VPB) is an example of a process employing both logics, and it represents the innovation process we found in the Nib, Ayat and butcher innovation process cases. Its innovation process is depicted in Figure 3.

The invention phase of VPB's innovation process was, like that of Bioventures, short in length, but, unlike Bioventures, significantly influenced by effectuation mechanisms. A high degree of uncertainty faced VPB as it launched its first fund in 2001, necessitating the Botswana government providing 100% of its funding. This uncertainty was a product of the undeveloped market for start-up financing in Botswana and the small size of the national economy, limiting deal flow. VPB's fund managers did not invest in this fund, acting effectually by limiting their losses to what they could afford to lose (their time and effort).

At the same time, causation mechanisms were acting during the invention phase in much the same way as in the Bioventures case. VPB was launched with a prospectus and in response to a consultant's report commissioned by the government, which recommended the establishment of a fund. VPB's founder demonstrated a clear vision for the fund, informed by a rigorous analytical process typical of causation thinking:

'The country needed equity finance. And the government faced four challenges. First, it had lots of cash. Second, there was a rising demand for increased citizen participation in the economy. Third, local SMEs were demanding more funding. And fourth, the economy needed to be diversified. At the same time, entrepreneurship was floundering. There were lots of one dimensional businesses, like bed and breakfasts, but very few two dimensional businesses, like those that would provide services to B&Bs. The government got a report from a Development Bank of Southern Africa consultant, who recommended that an outsourced VC fund could address these challenges. That's where we came in.'

As VPB moved into the development phase, this parallel utilization of effectual and causal reasoning was also evident. The more limited deal flow in Botswana caused VPB to broaden its investment strategy (experimentation) in consultation with its investor, who had access to data that would help to reduce the uncertainty of such a change (effectual pre-commitment). In parallel, once prospective investees were identified, VPB's investment process was strictly causal. This interplay between

experimentation and causation continued for seven years during the development phase.

VPB entered the implementation phase in 2010, when it used its track record to raise and launch a second fund focused on neighbouring Namibia. This fund was raised from Namibian government pension funds. A third fund, to be raised via a listing on the Botswana Stock Exchange, is also being planned. As with the earlier stages of VPB's innovation process, both effectuation (in the form of pre-commitments with well informed and connected investors such as Namibian pension funds) and causation (in the form of an investment prospectus and an elaborated vision for further expansion based on its track record) are evident in this phase.

Some propositions

Our results were substantially different from those produced by an earlier study using data from consumer Internet start-ups (Fisher, 2012). With respect to effectuation, Fisher (2012) found strong evidence that the following effectuation dimensions – experimentation, affordable loss and flexibility – were useful explanations of the entrepreneurs' actions studied. We also found that experimentation and affordable loss constructs were present in the majority of our cases, although contrary to Fisher (2012), we did not find that flexibility behaviours were present in a majority of cases. In another contrast with Fisher (2012), we found very strong evidence of pre-commitment. Given that this construct is shared with causation (Chandler *et al*, 2011), and given that we found strong evidence for causation, this result is not surprising.

Neither do our findings support Fisher's (2012) results with respect to causation. That study found that only two of the six cases studied demonstrated causation behaviours. By contrast, our study found that a majority of the cases demonstrated these behaviours, and to a greater extent than found in the earlier study.

This difference in findings causes us to advance our first proposition:

Proposition 1: The EE innovation process over-emphasizes pre-commitment and underemphasizes flexibility in comparison to that process in developed economies.

What could account for these three significant differences between our study and Fisher's (2012) study – an overemphasis on pre-commitment and causation and an underemphasis on flexibility? Our study differs from Fisher (2012) in two fundamental respects: industry and resource constraints. Fisher (2012) studied consumer Internet start-ups (that is, product innovation), while we studied financial innovations. Consumer Internet start-ups pursued opportunities created by emerging Web

technologies and were part of an industry in the process of formation. By contrast, our case studies came from an already established industry – financial services – into which innovations were introduced. This difference in industry stage may account for the greater emphasis on causation in our cases.

Fisher's (2012) case studies were exclusively from relatively resource-rich environments (founded in the USA and Canada), while our case studies were firms founded in relatively resource-scarce environments. In particular, Fisher's firms faced a liquid exit market, even in the wake of the 2000 financial market downturn; four of the six cases were acquired shortly after that study's period. Even in the US context of that period, these are unusually successful consumer Internet start-up exit outcomes. By contrast, none of our entrepreneurs has had liquidity events during our study or since it was completed. Each remains privately held. This may explain in part why our cases have overemphasized pre-commitment in comparison with Fisher (2012). Co-creation with external stakeholders – the heart of pre-commitment – becomes central to firm survival and growth when external resources are relatively scarce.

Perspectives such as effectuation are widely seen as independent of context. As noted above, our findings challenge that assumption. While effectuation in general was observed to be consistent with other studies (Fisher, 2012), the specific array of effectuation mechanisms observed was significantly different. Additionally, causation-based new product development models were employed more frequently than observed in studies based on Western data. Our study examined a different industry context from Fisher's.

Based on the foregoing, we theorize:

Proposition 2: The specific type and mix of innovation mechanisms depends on the industry context.

Consistent with Sarasvathy (2001), Berends *et al* (2014) found that as the product innovation process unfolded in Dutch SMEs, effectual logic was gradually displaced by causal thinking. Our cases demonstrate that, in the resource-constrained EE contexts in which the subject innovation processes were situated, effectual and causal mechanisms affected these processes at each stage: invention, development and, where it occurred, implementation. For example, causal thinking was as important for VPB in the implementation phase as it was in the invention and development phases. In differing degrees, we observed parallel logics of effectuation and causation influencing the innovation process in all stages in each of our cases. Therefore, we argue that:

Proposition 3a: The mix of effectuation and causation throughout the innovation process depends in

part on the degree and type of resource constraints facing innovators.

We also found that our financial innovators employed causation strategies more often as the economy-wide resource constraints they faced were lessened. In particular, our three cases from relatively less constrained environments – BP, VPB and Bioventures – all employed moderate to strong causation strategies. We suggest that:

Proposition 3b: As economy-wide resource constraints are reduced, innovators are more likely to employ causation strategies in the innovation process.

Discussion

This study began by asking: given higher levels of resource constraint in EEs, how does the innovation process unfold in conjunction with effectuation and/or causation logics? The study makes six empirical and methodological contributions. Empirically, through a rigorous, four-country, six-case research design combining interview and archival data, we find that (1) the EE innovation process overemphasizes the pre-commitment dimension of effectuation and underemphasizes its flexibility dimension, (2) the combination of effectual and causal mechanisms depends in part on the institutional and industry contexts, and (3) the mix of effectuation and causation in the innovation process depends in part on the degree and type of resource constraints, as well as changes in those constraints over time. Methodologically, we (1) bring data from four relatively underexplored settings from Sub-Saharan Africa and one under-studied industry – financial services – to the innovation process literature, (2) employ a process research approach that has been infrequently used in the effectuation literature stream, and (3) study the impact of effectuation on innovation process in a real-life setting, which has seldom been done before.

Implications and limitations

Our study has two implications for practice and policy. First, innovation processes in resource-constrained contexts such as EEs require a certain ambidexterity in the use of effectuation and causation logics. That ambidexterity can be enacted by individuals, teams, firms, networks and communities. Second, in designing legislation and regulation, policy makers should pay more attention to supporting incremental innovation, rather than allocating resources to 'white elephant' innovation projects.

As with any study of this nature, the present study

suffers from some limitations that offer avenues for further research. Other robust theoretical constructs – such as bricolage – should be incorporated into future studies in order to create a fuller picture of how effectuation and bricolage influence the innovation process in conditions that are both resource-constrained and uncertain. We created a significant survivor bias by choosing to study surviving examples of EE innovation processes. However, we are mindful of the importance of studying failure, so we have included two cases – Bioventures and the Ghanaian butcher – that did not reach the implementation stage of the innovation process. The data from our case studies will need to be supplemented with additional cases from the countries included in this study, as well as cases from elsewhere in Sub-Saharan Africa, other EE resource-constrained contexts such as South Asia and Latin America, and developed country resource-constrained contexts (for example, economically depressed regions). As in earlier studies, another limitation of this study pertains to focusing on one industry.

Conclusion

We set out to examine the issue of how product innovations occur in resource-constrained environments such as those typically found in many EEs. We have made a novel and significant contribution to the literatures on effectuation and the innovation process by finding that the former is implemented differently in the latter. By focusing on the EE innovation process we hope to contribute to an emerging conversation on innovation in such resource-constrained environments and to understand better how the innovation process is altered by the resultant cultural complexity. Our paper is one step towards better integrating effectuation into the innovation process literature by examining the distinctive challenges faced in the EE context.

Notes

¹ Emerging economies have been defined as ‘low-income, high-growth nations principally reliant on economic liberalization for their growth’ (Bruton *et al*, 2013, p 169).

² *Jugaad* is a colloquial Hindi word that roughly translates as ‘an innovative fix; an improvised solution born from ingenuity and cleverness. *Jugaad* is, quite simply, a unique way of thinking and acting in response to challenges; it is the gutsy art of spotting opportunities in the most adverse circumstances and resourcefully improvising solutions using simple means. *Jugaad* is about doing more with less.’ (Radjou *et al*, 2012, p 3)

³ *Kanju* is ‘the specific creativity borne from African difficulty’ (Olopade, 2014, p 20).

⁴ Due to space limitations, the event history figures for the three other cases are available from the corresponding author on request.

⁵ Bantustans were territories set aside for black Africans in South Africa during the apartheid era (1948–94).

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