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A structured literature review and suggestions for future effectuation research

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Abstract In spite of all the scholarly attention it has garnered, effectuation research continues to face a series of theoretical and methodological challenges. In order to help move effectuation research forward, we content-analyze a comprehensive sample of 101 effectuation articles published in JCR®-listed journals between 1998 and 2016 (inclusively), with the specific aim of uncovering the main conceptual and methodological articulations that have underpinned effectuation research to date. In doing so, we not only uncover some the field's achievements and shortcomings but also examine the extent to which published effectuation research addresses its most salient criticisms. We build on these observations to propose three recommendations for future advances, namely (1) conceiving effectuation as a "mode of action"; (2) developing new methodological indicators centered on effectuation's concrete manifestations; and (3) examining the underlying dynamics explaining effectuation's antecedents and consequences.

Keywords Effectuation · Entrepreneurship · Human action · Innovation · Market emergence

JEL classification B59 Current heterodox approaches—other · D03 Behavioral microeconomics—underlying principles · M13 Business administration—new firms and start-ups

1 Introduction

Effectuation has garnered considerable scholarly attention over the last 20 years (cf. Alsos and Clausen 2014; Gabrielsson and Politis 2011; Perry et al. 2012). Moreover, scientific interest for effectuation has extended well beyond entrepreneurship circles—including into creativity and innovation (e.g., Berends et al. 2014; Blauth et al. 2014), marketing (e.g., Chetty et al. 2015; Coviello and Joseph 2012), and operations and project management (e.g., Golicic and Sebastiao 2011; Midler and Silberzahn 2008).

Yet, in spite of all these contributions, vigorous debates remain about effectuation's articulation (cf. Arend et al. 2015, 2016; versus Garud and Gehman 2016; Gupta and Bylund 2017; Gupta et al. 2016; Read et al. 2016; Reuber et al. 2016). Academic research on effectuation has also grown into a somewhat fragmented literature (Alsos et al. 2016)—with different studies focusing on different topics, often using different conceptions, data, and/or methods of observation. These disparities make it difficult to build on prior studies, thereby hindering knowledge accumulation and hampering extant efforts to advance academic understanding of effectuation, its manifestations, antecedents, benefits, and pitfalls.

To help advance effectuation research in ways that could address these challenges, we content-analyze a comprehensive sample of 101 effectuation articles

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published between 1998 and 2016 (inclusively) in academic journals listed in the 2016 edition of Thomson Reuters' InCites™ Journal-Citation-Reports® (JCR). In the manner of what Geroski (1995) offered with respect to economic research on new venture entry, we begin by grouping together articles that focused on similar research questions and topics: this allows us to uncover the key principles and "stylized results" forming the core of effectuation knowledge to date. In turn, we investigate the conceptual and methodological articulations that enabled these core notions and findings. By doing so, we not only document the field's primary achievements but also examine the extent to which it addresses its most salient criticisms. Our analyses thus complement Arend et al.'s (2015) assessment of effectuation *theory* with an assessment of effectuation *research*. Building on these analyses, we use our creative judgment to effectually design suggestions for future research.

Our analyses and observations point to three promising avenues of future development. First, and in order to foster knowledge accumulation and alleviate extant confusion about effectuation's conceptual articulation, we argue for conceiving effectuation as a *mode of action*—an articulation that is consistent with effectuation's place within the broader research and theories of human action. Second, we recommend (and illustrate) the development of new methods of observation centered on carefully tailored behavioral indicators, specific to particular contexts, industries, or pursuits. Third, we encourage future studies to develop deeper explanations (and more rigorous observations) of the reasons *why* the mobilization of an effectual mode of action might have specific antecedents or consequences.

2 Effectuation research

The idea of effectuation has been abundantly discussed before. Accordingly, we only provide a brief overview of effectuation's core notions, followed by a summary of what prior reviews have highlighted.

2.1 The idea of effectuation

From a theoretical standpoint, effectuation is about human action—and more specifically, about the unfolding process of entrepreneurial action (see Arend et al. 2015, p. 631). It refers to a particular way of articulating one's actions, which also considers such things as the context in which these actions take place, the resources one has, the constraints one may face, and the aims, goals, and ends one might pursue given all this. What sets effectuation apart is that it centers squarely on those situations wherein formulating courses of action based on one's predictions about the future becomes fundamentally difficult—if not impossible altogether. This is the case of situations qualified as radically uncertain, that is, situations wherein the consequences of one's actions and the conditions and/or factors of success are ex ante unknowable (see Knight 1921; Wiltbank et al. 2006; Townsend et al. 2018).

Effectuation is thus particularly relevant for entrepreneurial efforts to introduce innovative products, services, and other "ways of doing business" in the economy (McMullen and Dimov 2013; McMullen and Shepherd 2006). The more novel and innovative such products, services, and other ways of doing business are, the less possible it becomes to obtain ahead of time valid information for optimizing what aspects or features to push forward, with what kind of customers and market(s), in what forms, how, through what channels or distribution mode, at what price point(s), and so on. An important reason for this is that in such situations, it becomes difficult for market actors to express their impressions of hitherto unknown innovations with which they are not familiar. For instance, automobile pioneer Henry Ford legendarily remarked: "If I'd asked my customers what they wanted, they would have said 'a faster horse'" (quoted in Brown 2009, p. 40). Because of the radical uncertainty inherent to entrepreneurial innovations, this kind of information cannot be obtained by extrapolating from prior cases. Instead of trying to act on the basis of a future that is impossible to predict, effectuation postulates that one can circumvent the uncertainty quagmire by actively trying to shape the future—and most notably by seeking out cocreative commitments from potential partners, suppliers, clients, and other stakeholders. By turning these commitments into realized actions, effectual actors end up creating a new reality that effectively sublimates prior uncertainties.

This explicit focus on the unfolding of human action in the face of radical uncertainty sets effectuation apart from causal models of human action. By contrast to such models, effectuation posits that the means, resources, and capabilities one can mobilize constitute more influential determinants of action than the ends one might elect to pursue. Needless to say, an individual might have some general sense of what s/he would like

to do (see McMullen and Shepherd 2006; Dimov 2017). But a highly defined goal derived from extensive analyses of one's circumstances to identify particularly salient and/or desirable ends need not form the starting point of one's entrepreneurial efforts.

Instead of trying to identify the optimal means to pursue a previously determined objective, acting effectually poses a different challenge to individual actors: *Given an uncertain world, what could I do with the means, resources, and capabilities I have or could readily mobilize?* Seen from this angle, human action ceases to be an optimization problem (finding the right means to pursue a given end, given a set of environmental constraints; see Simon 1973): it becomes an *imagination* problem, a *design* problem (cf. Hatchuel 2001; Sarasvathy 2003; Sarasvathy et al. 2008). Similarly, the process of entrepreneurial action is no longer conceived as a series of efforts to optimize goal pursuits in the face of constraining circumstances (as with causal models of human action); it becomes a series of efforts to engage the world with the means one has and to try convincing others to join in these efforts—with the potential effect of changing those circumstances and shaping an otherwise unpredictable future (Sarasvathy 2004; Sarasvathy et al. 2008, 2013).

2.2 The empirical evidence: what do we know from prior reviews

Initial support for effectuation emerged from Sarasvathy's (1998) dissertation at Carnegie Mellon University. Working with Nobel laureate Herbert A. Simon, Sarasvathy sought to answer two closely related research questions focusing on the particular reasoning strategies of expert entrepreneurs:

1. *What commonalities and differences exist in the decision-making processes of a group of expert entrepreneurs who start with the same idea for a new venture and face exactly the same set of decisions in building it?* (and)
2. *In the face of nonexistent or not-yet-existent markets, what underlying beliefs about the predictability of the future influence the decisions expert entrepreneurs make as they build a new venture?* (Sarasvathy 2008, p. 12)

Sarasvathy examined these questions by conducting a verbal protocol study (Ericsson and Simon 1993) wherein she presented 27 expert entrepreneurs with "ten decisions problems (that) arise in the context of building a new company for an imaginary product" (Sarasvathy 2008, p. 309). In turn, she observed that these individuals spontaneously and systematically approached the early stages of entrepreneurial pursuits by mobilizing five key principles: (1) bird in hand, (2) affordable loss, (3) lemonade, (4) patchwork quilt, and (5) pilot in the plane (see Sarasvathy 2001; but also 2008, p. 15–16 and Table 2). Although the generalizability of Sarasvathy's original findings have been called into question (see Arend et al. 2015, p. 638, and Baron 2009), these five principles gradually came to form the bedrock of effectuation's manifestations "in the real world"—the *markers* of effectuation, so to speak.

Working on that basis, Read et al. (2009b) conducted a meta-analytic review of 48 studies published in the *Journal of Business Venturing*—studies that focused on the relationships between variables these authors deemed representative of the above effectuation's principles (though not necessarily conceived or articulated to do so originally) and different measures of new venture performance. This review yielded early evidence of effectuation's performance benefits—at least with respect to the above bird-in-hand, lemonade, and patchwork-quilt principles. Owing to the small number of pertinent studies, evidence for the affordable-loss principle proved inconclusive, and the study did not include evidence for the pilot-in-the-plane principle. Furthermore, the authors readily admitted that while there was evidence supporting positive relationships between entrepreneurship-relevant means for the "*what I know, who am I, and whom I know*" sub-dimensions of the bird-in-hand principle, there also was evidence supporting a positive influence of more general means and resources (see Read et al. 2009b, p. 582–583). As such, their review's evidence for effectuation's unique benefits remained provisionary—the more so when considering that none of the studies included started out as an empirical test of effectuation (or had conceptualized their focal variables and relationships in such terms).

A few years later, Perry et al. (2012) published a literature review of effectuation research that identified 27 articles in which effectuation was a principal topic. Summarizing the main ideas advanced in their sample's 16 conceptual papers, these authors observed that "the contributions of many of the conceptual effectuation articles have been to present and define the concept of

effectuation, to contrast it to causation, and to describe when, how, and why effectuation may be used" (p. 841). Turning to their sample's 11 empirical studies, Perry et al. (2012) drew attention to a first set of five studies that mobilized verbal protocol techniques and hypothetical exercises to examine how different groups of individuals process risks-and-returns considerations and engage in entrepreneurship-related tasks. These studies lent preliminary support to the notion that as a group (Sarasvathy 1998; Sarasvathy and Dew 2005) or by comparison to bankers (Sarasvathy et al. 1998) and MBA students (Dew et al. 2009; Read, Dew et al. 2009), expert entrepreneurs "generally perceive risk and reward differently, they vary in their use of effectual and causal logic when confronted with scenarios involving risk and reward, and they differ in how they attempt to predict or control uncertainty" (Perry et al. 2012, p. 843). A second set of studies used qualitative analyses to examine whether entrepreneurs mobilize effectual principles when they launch new ventures in emerging industries (Sarasvathy and Kotha 2001), when they pursue opportunities in established organizations (Harting 2004) or when they face adverse conditions (Harmeling et al. 2004). Lastly, Perry et al. (2012) identified a third set of studies characterized by their mobilization of quantitative techniques. These included Chandler et al.'s (2011) study validating a self-report survey instrument to measure individual respondents' preferences for relying on causal and effectual logics; Wiltbank et al.'s (2009) study documenting that angel investors "who emphasize nonpredictive control experience a reduction in investment failures without a reduction in their number of successes" (p. 116); and the Read et al. (2009) meta-analysis summarized above. All in all, the studies reviewed by Perry et al. (2012) lent preliminary support to the notions that effectuation (1) seems prevalent among expert entrepreneurs; (2) is oft-mobilized when engaging in entrepreneurial pursuits (the more so under adverse conditions); and (3) is associated with increased performance.

2.3 Recent theoretical challenges

As we noted in Section 1, however, effectuation has recently been the object of vigorous exchanges prompted by a high-profile *Academy of Management Review* article by Arend et al. (2015). Expanding on Dubin's (1969) model of theory development, these authors first propose a 3E framework for theory evaluation. In their words:

> The three Es represent the natural order of theory building—that is, input, throughput, and output—that we label "experience," "explain," and "establish." Researchers experience the focal phenomenon they wish to theorize about through observation and literature review. They then explain the phenomenon through a model (i.e., defining the units, laws, bounds, and so on) of the causal processes and relationships involved. Finally, they establish the viability and value of the proposed theory though empirical testing, idea diffusion, and practical application. (p. 634)

To illustrate the import of their framework, these authors proceeded to assess effectuation's soundness "as a proposed new theory of entrepreneurship" (p. 630). They concluded that "effectuation meets several basic criteria for theory building, but far from all; more worrying, some of the criteria that are not met are specific to theorizing about entrepreneurship" (p. 631), prompting these authors to list and explain 11 specific points of contention (see Arend et al. 2015, Table 1 p. 635–6 and text p. 637–44).

This critique generated considerable attention, eventually culminating in a series of responses and counter-responses. Commentaries in support of effectuation argued that Arend et al.'s (2015) assessment offers misconceived positivist criticisms of what remains a pragmatist theory (Read et al. 2016; Reuber et al. 2016), misrepresents effectuation's body of research (Read et al. 2016), fails to appreciate effectuation's early stage in theory development (Reuber et al. 2016), and mistakenly uses variance-theory notions to assess the articulation of a process theory (Garud and Gehman 2016; Gupta et al. 2016). Arend et al. (2016) "refute every point contained in (these) commentaries" (see p. 549 and following), lamenting in passing the absence of suggestions for improving their 3E framework (see p. 554).

Curiously, both sides of the 2016 exchanges largely overlooked the five directions for future research that Arend et al. (2015) had offered with their initial assessment. These suggestions have merits. They notably challenge effectuation scholars to do more with the conceptual means and resources they already have—and convincingly point toward promising directions for future developments. Yet for all their insightfulness, these suggestions proceed from an overall assessment of

effectuation "as a proposed new theory of entrepreneurship" (p. 630)—and thus from arguably higher levels of analysis and granularity than the operational choices typically made in the crafting of a particular project's theoretical and methodological strategies. Moreover, Arend et al.'s (2015) suggestions remain grounded on their assessment of 29 articles published up to 2012—and these included only nine articles that did not list Sarasvathy as a coauthor (see Arend et al. 2015, footnote 9; and 2016, footnote 2). And neither side of the 2016 exchanges commented on extant efforts to tackle these suggestions—let alone offered recommendations as to which might be more pressing or salient.

To help reconnect these high-level theoretical challenges with the more immediate choices and tradeoffs one faces when developing new research projects on effectuation, we conduct a structured literature review where we not only identify the most salient *learnings* that emerged from past effectuation research but also uncover the conceptual articulations and methodological strategies that were mobilized to bring them forth. By doing so, we reveal effectuation research's primary achievements and shortcomings with respect to Arend et al.'s (2015) suggested directions. We then build on these observations to make additional recommendations for future effectuation research.

3 Method

In order to save journal space while remaining transparent to interested readers, Online Appendix A presents the search procedures and inclusion/exclusion criteria we used to identify the 101 relevant articles we analyzed for this review. The Appendix also includes the complete list of references to these articles. We present below the strategies we mobilized to analyze the corpus.

3.1 Grouping strategy

In order to conduct our analyses in the most meaningful manner possible (given our review's particular objectives of assessing effectuation research's conceptual and methodological underpinnings), we began by forming groups of articles that focused on similar topics and/or offered similar findings. Prompted by an insightful suggestion from the Special Issue's coeditors, we formed groups of conceptual articles that exhibited similar purposes and/or advocated similar notions, and groups of empirical articles that collectively lent support to an overarching "stylized result"—as coined by Geroski (1995) to summarize extant economic research on new venture entry.

> At best, (*stylized results*) reflect robust associations between variables of interest, and they can be useful in providing a rough stylization of the relationship which seems to exist between these variables. (1995: p. 427)

Keeping in mind our review's purpose, the main advantage of Geroski's (1995) "stylized" approach is to provide an insightful way to synthesize the most salient ideas emerging from prior effectuation research. In turn, this strategy allows us to conduct our analyses on meaningful clusters of similar effectuation articles, thereby increasing our observations' precision and specificity.

We identified three main clusters among the 37 conceptual articles in our sample: these clusters were relatively well defined, both chronologically and with respect to the groups of authors involved. We also identified seven main clusters of empirical articles—each with a set of studies that collectively lent support to a particular "stylized result." These seven clusters account for 46 of the 64 empirical articles in our sample (71.9%). We explain below how we considered the 18 remaining articles in our analyses.

3.2 Content analyses

To help reveal effectuation research's conceptual and methodological underpinnings, we carefully studied each cluster's articles to document relevant information pertaining to the following dimensions: (1) an article's key theoretical propositions and/or findings; (2) its conceptual articulation of effectuation (generally professed in the first few instances of the term)—and for the empirical articles, (3) the data collection method(s) and sample(s) used; and (4) the methodological means mobilized to capture, measure and/or observe effectuation's manifestations (please see Online Appendix A, Table A2).

We worked alongside one another to analyze the 101 articles in our sample. Consistent with standard practices of content analysis (see Saldaña 2015), we anchored our coding on the particular words and sentences

advanced in each article. We carefully revised our analyses as we went along, revisiting some of our earlier characterizations to make sure they were anchored on relevant excerpts or syntheses.

After a few iterations, we conducted the same content analyses on the 18 empirical articles not already associated with a stylized result. By doing so, we verified that these articles did not align with an already identified result. More importantly, we verified that these articles did not exhibit conceptual articulations and/or methodological strategies that would warrant further considerations in our analyses. In the same spirit, we also revisited all the articles we had initially categorized as peripheral (as per the definition in Appendix A) to examine whether any of them contributed ideas, insights, and/or findings that could be integrated to our primary-focus analyses. This resulted in our reintegration of four articles to the main sample.

4 Results

In order to save journal space while remaining transparent to interested readers, Online Appendix B reports the analytical summaries of the articles in our sample. We present below the synthesis of our findings, in the form of a preliminary assessment of the conceptual and/or methodological articulations of each cluster. We conclude with a discussion that links our findings and observations with Arend et al.'s (2015) suggested directions (please see Table 1 in Section 5.1 below): doing so provides a "bridge" to our subsequent recommendations for future research.

4.1 The articulation of effectuation research's conceptual articles

Table B1 (in online Appendix B) summarizes the key idea(s) and conceptual articulations advanced in the 37 conceptual articles we identified. As a whole, these articles yield the following observation:

> *Stylized observation:* To date, conceptual articles on effectuation include (a) efforts to define what the notion entails; (b) point/counterpoint exchanges about effectuation's distinctiveness; and (c) discussions of what effectuation implies in particular circumstances, contexts, and/or fields of application.

Examining the conceptual articulation of these articles, we observe that virtually all of them build on Sarasvathy's original definitions of effectuation as a "process" (2001, p. 245) or "logic" (2008, p. 61). Yet, a close reading revealed that many articles came to adopt a plethora of terms that are used more or less interchangeably, sometimes within the same paper and without necessarily considering the possible nuances each might imply (see online Appendix B, Table B1). Among the most salient alternatives, effectuation is sometimes presented as an *approach*, a *model of decision-making*, a *series of heuristics*, a *set of principles*, a *form of reasoning*, or a *theoretical framework*. In some articles, effectuation concerns a relatively specific decision in a particular set of circumstances, at a precise point in time in the evolution of a new venture/market. In others, it refers to a much broader process taking place across multiple locations over several months. As a result, the conceptual picture of effectuation emerging from these articles is arguably murkier than it could be. Considering that the proliferation of different conceptual articulations continues to occur in some of the more recent conceptual articles we identified, we worry that this practice might not only hinder knowledge accumulation, but that it could also pose serious difficulties for future theoretical developments. We return to this issue in our discussion below.

4.2 The articulation of effectuation research's empirical studies

4.2.1 Individual antecedents to effectuation

Table B2 (in online Appendix B) reports the characteristics of the 10 studies in our sample focused on investigating individual antecedents to effectuation. Taken together, these studies point toward a somewhat disconcerting stylized result.

> *Stylized result #1* Empirical evidence supporting individual-level explanations for one's mobilization of an effectual mode of action remains inconclusive.

In a nutshell, some studies report that effectuation's mobilization increases with entrepreneurial engagement/experience, whereas other studies find it prevalent

among students and novice entrepreneurs. Close examination of these 10 articles indicates that different studies build on different literatures and theoretical rationales (e.g., research on expertise, on social identity, or on learning and education). These studies also used different conceptual articulations of effectuation (with terms ranging from *approach*, *logic*, and *set of heuristics* to *behaviors* and *processes*) and leveraged different data collection methods, sometimes to capture individuals' effective use of causation and effectuation, and other times to capture their self-reflective preferences for such modes of action. Considering these theoretical and methodological differences, but also the various empirical findings reported, it thus seems prudent to surmise that for the time being, evidence about possible relationships between individual characteristics and one's mobilization of / preference towards effectuation remains inconclusive.

4.2.2 Causation and effectuation

Table B3 (in online Appendix B) reports the characteristics of a second set of 16 studies focused on the unfolding of entrepreneurial efforts by different individuals, firms, and organizations in a vast array of circumstances. These primarily qualitative studies yield three interconnected stylized results (#2, #3, and #4).

> *Stylized result #2* Effectuation is neither rare, nor does it seem to be used on its own.

This stylized result presents a marked difference with early effectuation studies that tended to magnify effectuation's distinctions with causation and other formal models of human action (cf. Chandler et al. 2011; Dew et al. 2009; Sarasvathy et al. 1998). Instead of pitting causation and effectuation as either/or alternatives, more recent studies argue that entrepreneurial efforts proceed from a combination of the two (see Table B3 in online Appendix B, Panel A). Some studies even argue that the two modes of action effectively complement one another and that integrating causation and effectuation could yield important benefits, especially when pursuing highly innovative projects (see stylized result #4 below).

Taken together, the many studies documenting the co-occurrence of causation and effectuation suggest that although the either-or dichotomization between the two modes of action might have been a useful "pedagogical" strategy to introduce effectuation's ideas to a broader academic audience earlier on (see Sarasvathy 2001), the causation-OR-effectuation rhetoric might have become an empirical dead end. Indeed, Sarasvathy readily pointed out that causation and effectuation are not mutually exclusive—and can indeed "work in a complementary fashion" (2001: p. 255). As such, studies supporting stylized result #2 lend credence to a more nuanced conception of the similarities and differences between causation and effectuation. Instead of pitting the two against one another as either-or alternatives, promising avenues of future research lie in better understanding the conditions and circumstances that could explain *why* effectuation might be normatively superior—and *why* some entrepreneurs appear particularly able to mobilize the more appropriate mode of action for the circumstances they face (see Read et al. 2016).

From a methodological standpoint, however, our analyses reveal that many studies documenting the co-occurrence/combination of causation and effectuation rely on qualitative analyses of illustrative cases, yet offer few details about the specific coding schemes, indicators, and other measures upon which they anchor their conclusions. In spite of a few exceptions (namely Fisher's (2012) and Reymen et al.'s (2015) explicit specifications of the coding schemes they developed), the lack of explicit methodological details characterizing many studies undermines their findings' interpretability and validity, but also the field's understanding of what effectuation entails in concrete actionable terms relevant for future research. We return to this observation in our recommendations below.

These interrogations notwithstanding, empirical observations that effectuation might naturally co-occur alongside other modes of action called for examining the reasons why it might be more prevalent in some circumstances: this premise prompted a series of studies focusing on firm-level factors and circumstances affecting the mobilization of effectuation (see Table B3 in online Appendix B, Panel B), which collectively yielded the following:

> *Stylized result #3* Three primary types of firm-level factors and circumstances appear to influence the mobilization of an effectual mode of action: (1) internal constraints; (2) external constraints; and (3) time, or the development stage of an entrepreneurial venture, with effectuation being more prevalent earlier, where uncertainty is highest.

From a theoretical standpoint, the studies supporting this third stylized result have the merit of beginning to answer extant calls to delve deeper into explaining when, where, and why effectuation may be more or less prevalent (see Arend et al. 2015: p. 644). That said, we note that although many of these studies provide convincing data in support of the alternating or simultaneous occurrence of causation and effectuation, the theoretical explanations offered for the underlying mechanics explaining why this might occur are not always articulated. For instance, some studies report descriptive observations of apparent shifts from effectuation toward causation with the development of a project, but the deeper underlying reasons explaining such shifts are sometimes left unspecified. More concerning perhaps is the observation that such explaining mechanisms are often assumed or implied, but rarely observed directly, let alone measured specifically. For instance, a study will note that the presence of external investors tends to encourage a shift toward causation, but the informational demands and other pressures assumed to explain such shifts are typically not documented. This shortcoming ultimately diminishes the theoretical import and validity of otherwise pertinent observations. Along this line, we also note that many of the studies supporting stylized result #3 do not always specify explicitly the methods by which they derived their effectuation observations. These limitations notwithstanding, many of the above studies implicitly or explicitly lead to a fourth stylized result.

> *Stylized result #4* Dynamic abilities to integrate, merge, and/or shift between causal and effectual modes of action appear particularly useful.

Although empirical articles supporting stylized result #4 are only emerging (see the three articles in Table B3 in online Appendix B, Panel C), they form a logical extension to the aforementioned studies documenting the co-occurrence of different modes of action (and the eventual shifts between these). From a conceptual standpoint, these studies have the merit of suggesting a nuanced view of the advantages that may follow from effectuation. That being said, we note that while these studies build on a conception of effectuation as an overall "logic," they differ markedly in what this logic entails. Is it about the design, implementation, and/or adjustment of public policies? Is it about the response to new information and the manner in which one leverages existing means and contacts? Is it about the cocreation of workable solutions with partners and stakeholders? Or is it about all of these things, taken together? Though each study is internally consistent, it becomes difficult to form a coherent picture of what effectuation is (and is not) when considering the conceptual articulation advanced across these three articles.

From a methodological standpoint, we are pleased to highlight Reymen et al.'s (2015) particularly detailed approach for "measuring" instances of effectuation in the field. Instead of relying on the overarching categorization of entire processes or broad tendencies exhibited within particular firms, these authors brought an arguably more precise focus on decision-making events (and their sequencing in time). In addition, these authors provide ample details about the coding schemes and indicators they developed for analyzing their data. We see these methodological strategies as positive avenues for augmenting the field's contributions. By contrast, however, other studies in this set proved more evasive in their methods, simply building on ex ante assumptions that certain approaches to policy are more akin to causation or effectuation, or on broad a priori expectations about the manifestations of the two modes of action. Here again, the disparity of articulations raises validity and knowledge accumulation challenges.

4.2.3 Effectuation and performance

Having summarized our analyses for the articles exploring the relative prevalence of causation and effectuation, we turn to studies focusing more squarely on effectuation's consequences. Like in Read et al.'s (2009b) meta-analytic review, a first set of five studies examines potential relationships between effectuation and new venture performance and growth (see Table B4 in online Appendix B). Unlike Read et al. (2009b), however, the studies we analyzed here were specifically designed to focus on effectuation's effects on performance. These studies lend support to the following:

> *Stylized result #5* There is preliminary evidence that mobilizing an effectual mode of action appears to have beneficial effects on new venture performance and growth.

In many ways, these studies' specific focus on effectuation's relationships with new venture growth and performance—and the consideration of moderating and mediating relationships integrating effectuation alongside other variables—offer interesting advances about effectuation's benefits. These studies notably echo an emerging interest for examining the underlying reasons and mechanisms explaining why effectuation might have some particular performance effects (even if some studies are not always very articulate in developing the theoretical rationales for such explanations).

Yet here again, important issues appear to undermine such advances. On the theoretical front, we note a continuing abundance of conceptual articulations where effectuation is alternatively a *form of reasoning*, a *decision-making orientation*, a kind of *logic*, a *process*, or *a set of venturing principles/processes*. More fundamentally, perhaps, we remark that these different conceptions are not always carried out in consistent theory-to-method articulations. For instance, studies stressing a conception of effectuation as a decision-making *logic* or *process* end up mobilizing data collection strategies wherein respondents must offer self-reflective observations about the behaviors, practices, and other strategies they implemented in their venturing efforts. Furthermore, we also remark that all the results reported in Table B4 are either derived from interpretative analyses of effectuation's effects on performance, or on self-report survey measures of performance. Notwithstanding extant debates about the pertinence and validity of such measures (see Dess and Robinson 1984; Wall et al. 2004), we worry that the sole reliance on subjective observations places an important limit on the stylized result emerging from these performance studies. In order to foster more solid footings for stylized result #5, we would encourage the complementary addition of other methods and techniques to examine the effectuation-performance relationships.

4.2.4 Effectuation and internationalization

Table B5 (in online Appendix B) report our analyses of the nine studies in our sample focusing on effectuation's implications in international entrepreneurship. Taken together, these studies lend support to the following:

> *Stylized result #6* There is preliminary evidence that mobilizing an effectual mode of action appears to have beneficial effects on a venture's internationalization efforts.

Similar to what we have seen with other stylized results, the studies examining effectuation's impact on internationalization have collectively tended to advance different conceptual articulations wherein effectuation is alternatively a form of *logic* (for new venture creation), a decision-making *orientation*, a set of decision-making *heuristics*, or otherwise unspecified *processes*. Some studies even include different terms within the same definitional paragraphs—for instance, writing of effectuation as both a form of logic and a set of processes. Methodologically, the primarily qualitative studies have tended to base their observations on unspecified interpretative analyses focusing on what had taken place in the unfolding development of different internationalizing efforts, and often focusing on the particular actions and behaviors undertaken by internationalizers at different moments and/or in light of different circumstances. We return to these observations in the discussion below.

4.2.5 Effectuation, creativity, and innovation

Over and above the studies examining broad outcomes like firm-level performance and growth, an interesting set of four studies focused more specifically on the potential influence of effectuation with respect to creativity and innovation. Listed in Table B6 (in online Appendix B), these studies collectively lend support to the following:

> *Stylized result #7* There is preliminary evidence that mobilizing an effectual mode of action appears to have beneficial effects on creativity and innovation.

These studies denote an emerging interest not only for exploring the benefits of mobilizing effectuation to foster creativity and innovation in different contexts, but also in investigating the underlying attitudes, orientations, and preferences that underpin these effects (cf. Blauth et al. 2014; Brettel et al. 2012). These are important advances. Nevertheless, we worry that as with the other stylized results above, the studies supporting stylized result #7 collectively exhibit varying conceptualizations of effectuation combined with interpretative observations, and/or self-report reflective measures. Although we do not question the pertinence and validity of using these methods in particular studies, we are concerned that the stylized result documented here solely rests on such methods.

5 Discussion

5.1 A step back to move forward: bridging our observations with Arend et al. (2015)

What do the above observations imply? For one thing, our structured literature review indicates that in spite of vigorous challenges, criticisms, and debates, effectuation research is doing quite well. Indeed, our sampling procedures documented that effectuation research has grown steadily over the years. Increasing numbers of effectuation articles are appearing in several JCR®-listed journals—and not only in entrepreneurship journals but also in journals targeting broader academic audiences ranging from the managerial and organizational sciences to other business disciplines like applied economics and marketing, or in domains such as creativity and applied psychology. More importantly, our content analyses show that the body of effectuation research has produced an emerging set of stylized notions and results about the nature of effectuation, its relationships with other modes of action, the modalities influencing its use, and its potential advantages in different tasks, pursuits, and contexts.

That being said, our analyses also revealed several points of concern we think opportune to juxtapose alongside Arend et al.'s (2015) criticisms and recommendations. To this aim, Table 1 draws parallels among the five suggested directions offered by Arend et al. (2015, p. 644–6) and our review's findings. This allows us to cast light on some of effectuation research's most notable achievements, but also on some of its more salient shortcomings. In sum, Table 1 helps "set the table" for developing further recommendations about the conceptual and methodological articulation of future research.

All in all, three primary points of concern emerge from our analyses of effectuation research's conceptual and methodological underpinnings. First, we worry that effectuation's conceptual articulation remains ambivalent. This is notably manifest in the proliferation of different terms and definitional foci, but also in the range of phenomena associated with effectuation. As a result, effectuation comes dangerously close to forming a catch-all potpourri for anything that is not closely linear or rational, anything akin to creative experimentations and explorations, or anything that involves some form of cocreation/coconstruction dynamics. Second, we are concerned that the strategies mobilized to "observe" or "measure" effectuation (and its manifestations) are sometimes left unspecified, fluctuate greatly across studies within a particular topic, or do not always align with a paper's stated conception of effectuation. Third, we remarked that over and above the empirical results reported in different studies, the theoretical rationales advanced to explain the observed effects are not always elaborate—nor examined specifically. Many studies advance a summary explanation for an effect and report empirical findings about such an effect, but the explanations offered are only assumed: they are seldom observed or tested.

By bringing to light the underlying theory-and-method articulations characterizing extant effectuation research, our analyses help clarify some of the most salient issues thwarting further advances. In turn, these observations allow for a more precise focus on particular areas of intervention, thus enabling the creative identification of possible paths for moving forward. Building on the above findings and observations, we henceforth propose three avenues for advancing effectuation research: (1) adopting a conceptual articulation of effectuation as a *mode of action*; (2) defining new (and arguably more articulate) means of observations for capturing effectuation and its manifestations; and (3) articulating more elaborate explanations (and observations) for why effectuation has the antecedents and consequences it appears to have. We discuss each avenue in turn.

5.2 Recommendation #1: conceiving effectuation as a mode of action

Is effectuation a theory? This question is at the basis of Arend et al.'s (2015) criticism of effectuation's soundness "as a proposed new theory of entrepreneurship (p. 630)." To help move effectuation research forward, we first clarify that effectuation is *not* a theory—at least not in and of itself. Although we readily appreciate the messages of prior efforts to assess the theoretical soundness of effectuation, we fear that thinking of effectuation as an overall theory might have become a distracting red herring. After all, Sarasvathy herself has been explicitly guarded about her conception of effectuation. In her own words from the seminal 2008 monograph:

> "It became increasingly clear to me that a pragmatist approach, leading to the development of effectuation as a logic of entrepreneurial action rather than a theory of how entrepreneurs do (descriptive) or should (normative) act, offered

Table 1 Integrating our review's stylized results with Arend et al.'s (2015) suggested directions

Arend et al.'s 2015 suggested directions for future research	Immediate implications of our findings with respect to Arend et al.'s (2015) suggested directions
Direction #1: address the "why" Effectuation research should move beyond "descriptions of *what* expert entrepreneurs do and *how* they act under conditions of uncertainty (…) to explaining *why* the decisions and actions (of effectual entrepreneurs) are effective, efficient, and better than alternatives" (p. 644);	With respect to the first point, evidence from our structured literature review indicates that efforts to implement Arend et al.'s (2015) suggestion are already underway. Indeed, we remarked a general decrease in the number of descriptive studies focused on what expert entrepreneurs do and how. As to the second point, *stylized results #5, #6, and #7* indicate that there is mounting evidence that mobilizing an effectual mode of action can yield positive benefits on a host of desirable outcomes—and can thus be effective. Furthermore, studies associated with *stylized result #4* highlight the apparent usefulness of dynamic abilities to integrate, merge, and/or shift among different modes of action. As a whole, these findings provide a solid basis for scholars to begin theorizing about—and investigating—the reasons why and under what circumstances effectuation may be more efficient than alternatives. However, we signal that addressing these questions will demand more advanced treatments of the *costs* of mobilizing different modes of action.
Direction #2: specify the landscape Effectuation research should delve "more deeply into the roles of parties such as co-creators, rivals, institutions, and other whom-the-entrepreneurs-knows participants" (p. 645) to better specify the theoretical landscape of effectuation and its influencing units and dynamic interactions;	Just like we observed above, studies associated with *stylized result #3* indicate that efforts to address this challenge are already underway. To date, however, extant studies have primarily focused on the interactive dynamics between effectual entrepreneurs and some of their most immediate partners and stakeholders (like their employees, first few clients, and/or investors). As such, we find a lot of merits in Arend et al.'s (2015) suggestion to examine the role of more distal cocreators, rivals, institutions, and so on (see Venkataraman et al. 2012 for similar encouragements). Among other promising directions, Ramesh et al. (2018) have begun examining entrepreneurs' deliberate practice of "asking others" and the role of this practice in the development of entrepreneurial expertise.
Direction #3: express interesting propositions and prescriptions Effectuation research should advance "testable propositions and nonobvious prescriptions that are attractive to academic and practitioner audiences" (…) notably by improving "the precision in defining which problems effectuation addresses, where it outperforms alternative approaches, and what its costs, benefits, and risks are under specific conditions" (p. 645);	Our structured literature review points to four distinct elements relevant to Arend et al.'s (2015) third recommendation. 1. The works associated with all seven of our *stylized results* suggest that there has been no shortage of testable propositions that have apparently attracted the attention of academics and practitioners. (…) 2. Likewise, these suggest that the problems that effectuation addresses are reasonably well understood: there is converging focus on circumstances and pursuits characterized with high levels of radical uncertainty. 3. Like Arend et al. (2015) and as mentioned with respect to their *suggested direction #1* above, however, we wholeheartedly encourage further examinations of effectuation's costs and risks—and our analyses indicate that there already is a basis for formalizing such examinations. 4. What may seem less "precise" than desirable in our findings concerns (a) the conceptual articulation of effectuation across different studies, and (b) the methodological strategies for capturing its concrete manifestations. Considering the particular importance of both points for future effectuation research, we explicitly address both in our recommendations.

Table 1 (continued)

Arend et al.'s 2015 suggested directions for future research	Immediate implications of our findings with respect to Arend et al.'s (2015) suggested directions
Direction #4: build on previous work (and obtain more data) Effectuation research should "build on previous work (from) related, often preexisting concepts that also seek to explain entrepreneurial activity" (...) and obtain more data (from different scholars/methods) to explain the differentiation of effectuation as a proposed theory of entrepreneurship from previous ideas and from current alternative proposed theories of entrepreneurial activity" (p. 646);	Although our analyses were never meant to document effectuation articles' efforts to draw from related concepts and theories (bibliometric techniques could be mobilized for that), *stylized results #2, #3, and #4* show that the distinctions between causation and effectuation have been well explored. Consistent with Arend et al.'s (2015) admonitions, this suggests that more substantial opportunities of contributions might exist in exploring effectuation "as a stand-alone model" and by unpacking its "different assumptions, heuristics, mechanics, trade-offs, and outcomes" (p. 646). As such, we second their recommendations for more comparison articles. In this regard, however, our observations reveal that effectuation articles use a plethora of different terms in reference to their central construct (approach, heuristic, logic, and so on). Whether this fact proceeds from widespread ambivalence or lingering confusion about the ontological nature of effectuation, we offer that this imprecision disserves the field. More fundamentally, we note that this conundrum extends to the status of effectuation as an "overall theory of entrepreneurship." Considering the critical importance of these tensions, we make them a central point of our recommendations below.
Direction #5: consider a radical refocusing of the approach Effectuation research should leave aside the premise that "all entrepreneurs 'can' but few'do' what effectuation prescribes () to address (instead) the question of how and when to go from cannot to can, and then focusing on the process of moving from can to do" (p. 646).	We wholeheartedly applaud Arend et al.'s (2015) admonitions to consider the macroeconomic efficiency of assuming that all entrepreneurs can do what effectuation prescribes. As it stands, our *stylized result #1* indicates that more research is needed to identify the individual-level drivers of effectuation—and the reasons why they have this effect. Interestingly, however, studies underpinning our *stylized result #2* suggest that effectuation might be more prevalent than Arend et al. (2015) seem to postulate in their text (see p. 646). Furthermore, the studies associated with *stylized result #4* suggest that the paths to entrepreneurial success might be more varied and complex than the sole reliance on a single modus operandi. As such, our results indicate that there already is a broad basis of works upon which to build in order to explore Arend et al.'s (2015) challenging ideas.

> possibilities that were hard to resist. By logic, I mean an internally consistent set of ideas that form a clear basis for action upon the world. A theory is a statement about the truth or otherwise of a phenomenon in the world.
>
> In the rest of the book, I shall carefully think through effectuation as a pragmatist logic for acting upon the world rather than as a positivist theory to be tested and proved true or false." (2008, p. 61–62, with emphasis in the original).

By advancing the position that effectuation is *not* a theory, at least not in and of itself, we do not wish to diminish the importance of developing new theoretical ideas to advance academic understanding of effectuation, nor do we negate effectuation research's potential to contribute new and meaningful theoretical insights about entrepreneurship or other relevant phenomena. Rather, we merely seek to help posit what effectuation is (and is not) with the specific objective of fostering more consistent theoretical developments and knowledge accumulation.

Building on Sarasvathy's (2001, 2008) original impetus, we propose that effectuation research remains a pertinent part of the broader ensemble of *theories of human action* (see Dancy and Sandis 2015; O'Connor and Sandis 2010). Some of these theories emphasize the (assumed) rational calculations of *Homo Economicus* in light of formal parameters and normative benchmarks (e.g., utility theory or prospect theory) (Kahneman and Tversky 1979; Luce and Raiffa 1957; Mises 1949). By contrast, other theories emphasize the affective, cognitive, cultural, neurophysiological, political, psychological, social, and/or symbolic dynamics that guide (or sometimes constrain) human action (see Korsgaard 2008; Morsella et al. 2009). Effectuation undoubtedly has the potential and ability to make timely and important contributions to these theories, notably because of the distinctive attention it brings to the behavioral strategies individuals are able to mobilize to act and "do things" in the face of radical uncertainty.

Yet to help alleviate the apparent confusion with respect to effectuation's conceptual articulation, we propose to forgo manifestly ambiguous terms like *approach*, *heuristic*, *logic*, and *process* to conceive effectuation as a *mode of action*. Doing so has several important advantages. It is consistent with effectuation's place and contributions among the broader ensemble of human action research. It is also consistent with the notion that causation and effectuation form two alternate *modes of action* that are not antithetical to one another, but could be mobilized alongside one another, or even integrated with one another. More pointedly, conceiving effectuation as a *mode of action* arguably offers a clear and simple epithet that subsumes the underlying notions implied by other terms—such as the idea that effectuation is a different manner of approaching problems, a different way of making decisions, a different logic for thinking of one's actions, or a different process for carrying out such actions. By embracing what these different terms have in common as part of "an internally consistent set of ideas that form a clear basis for action upon the world" (Sarasvathy 2008, p. 61–62), conceiving effectuation as a *mode of action* alleviates the need to debate whether different terms imply theoretically important nuances—or simply reflect stylistic preferences toward a particular synonym. Conceiving effectuation as a *mode of action* thus allows for more precise theory building and knowledge accumulation. Moreover, the term *mode of action* implies more direct associations with the concrete behavioral manifestations of effectuation epitomized by the aforementioned "five principles." We thus submit that a *mode-of-action* conception of effectuation could also help foster a strengthening of effectuation research's theory-to-method articulations, a point we focus on with our second recommendation for future research.

5.3 Recommendation #2: defining new means of observation for effectuation's manifestations

As we signaled above, our analyses show that extant methodological practices for studying effectuation primarily rest on qualitative researchers' "interpretive acumen" (with coding schemes and other rules of interpretations not always specified), or on survey respondents' self-reflective retrospective assessment of their preferences or past behaviors. Needless to say, we have nothing against such data collection methods per se. When used properly, these methods can yield valid observations about a range of different phenomena. Yet, we are somewhat concerned about the extent to which the bulk of effectuation research relies on such methods. More fundamentally, we are surprised to remark that in their finer-grained details, the methodological strategies leveraged to capture effectuation in different studies do not necessarily align with the particular

conceptions of effectuation these studies advance. For instance, some studies advance a conception of effectuation as a reasoning approach (or a set of decision-making heuristics) yet mobilize methods for documenting effectuation that do not focus on entrepreneurs' reasoning (or decisions), but on their actions and behaviors. In addition, we are concerned that the self-reflective and retrospective nature of many methods might pose precision and validity issues, especially when asking respondents to reflect on their firm's engagement with activities or concepts that are deemed socially desirable, like experimenting or exhibiting flexibility. As such, we worry that the reliance on self-reflective instruments might yield imprecise, unfocused, or misrepresentative pictures of effectuation.

To address these issues and help move effectuation research forward, we encourage the development of new means of observations for more directly capturing the concrete manifestations that denote an effectual mode of action. We already acknowledged some of the more recent efforts on this front, most notably by Reymen et al. (2015). To complement these efforts in a manner consistent with the above proposal to conceive of effectuation as a mode of action, we encourage scholars to go beyond interpretative and psychometric methods to document instead the actual manifestations of effectuation's core principles, focusing on the consequent behaviors associated with these principles.

To the extent that it is possible, we also encourage the articulation of such data in terms of relevant "metrics" or "quantities"—so as to allow for assessing the extent to which what is observed represents *more* or *less* mobilization of an effectual mode of action, and with what force, intensity, or strength. Doing so would allow for systematic comparisons both within and across cases. Needless to say, the bases of such metrics need not necessarily be objectively quantitative: in practice, the kind of measurement method we propose could rely on qualitative interpretations that would then be systematically translated in terms of agreed-upon scales or dimensions. Our argument is simply to encourage a certain formalization of future observations in terms that are systematically quantifiable, thus allowing for "apples-to-apples" comparisons within and across cases, studies, tasks, and other contexts and circumstances. We illustrate in Table 2 the form that such proposed new measures of effectuation could take.

5.4 Recommendation #3: developing "why" explanations (and studying them)

Lastly, our analyses revealed that as a whole, prior studies examining the individual antecedents of effectuation have yielded somewhat inconclusive results. We also remarked that extant studies focusing on effectuation's consequences tended to exhibit weakly articulated theoretical explanations that were rarely measured empirically. To help foster meaningful advances in future effectuation research, our third avenue of development encourages the conduct of more research investigating the particular reasons *why* the mobilization of an effectual mode of action augments (or diminishes) with changes in particular antecedents, and *why* this mobilization yields specific consequences. In practice, we submit that implementing this recommendation calls for research to implement three converging strategies:

1. Developing strong, powerfully convincing theoretical explanations for *why* a particular antecedent variable fosters the mobilization of an effectual mode of action, for *why* effectuation might provide some particular performance-inducing advantage, and/or for *why* some moderator or mediating variable might accelerate/enable this particular advantage;
2. Developing research designs that allow for capturing specific instances of these explanations: for example, this could imply efforts to document the actual learning whereby one's experience of entrepreneurship fosters the mobilization of an effectual mode of action, efforts to empirically document the very performance-inducing advantages that effectuation is professed to have in terms of lower information costs or faster decision-making, or efforts to properly document variations in the moderator/mediating variables that are hypothesized to accelerate/enable such advantage;
3. Specifically reporting and interpreting empirical results of the above in ways that allow for knowledge building and replications across studies.

In short, we encourage rigorous research on the antecedents and consequences of effectuation—research that not only develops strong theoretical explanations for the effects it advances but that also documents the

Table 2 Developing new methods of observation for effectuation's manifestations

Effectuation's five principles	Illustrative proposals for new means of observation
1. The bird-in-hand principle (start with your means) When expert entrepreneurs set out to build a new venture, they start with their means: who I am, what I know, and whom I know. Then, the entrepreneurs imagine possibilities that originate from their means.	Acknowledging that the very nature of nascent entrepreneurship makes it difficult to document the "live" mobilization of this principle, directly as it takes place, we encourage the use of structured interviews and other formal inventory and repertory techniques to systematically "map out" what particular means, resources, knowledge, and contacts were mobilized during the earliest stages of entrepreneurship/innovation efforts. More pointedly, we argue that it is no longer enough to simply attest that an entrepreneur (or a team thereof) started with what she is, what she knew, and whom she knew. To foster finer-grained measurement and allow for making valid comparisons within and between cases, we encourage efforts to assess the magnitude of such early means, resources, knowledge, and contacts. •A possibility for the "who I am" subdimension might be to measure the extent of one's prior experience/expertise vis-à-vis the venture's domain of activity, product/services, or industry/market context. •A possibility for the "what I know" subdimension might be to actually assess the a priori knowledge one has (had) of such domains. •A possibility for the "whom I know" subdimension might be to document the number of network contacts that were consulted during the nascent stage, and to ascertain the strength of the network ties and contributions of such contacts. •Lastly, one might also consider using some quantitative techniques to "estimate" the overall *value* or *contribution* of the initial means and resources invested during the nascent stages.
2. The affordable-loss principle Expert entrepreneurs limit risk by understanding what they can afford to lose at each step, instead of seeking all-or-nothing opportunities. They choose goals and actions where there is upside even if the downside ends up happening.	Here, we propose to develop new measures that would document the (forward-looking) affordable-loss investments entrepreneurs make in order to test their ideas, launch their business, encourage potential stakeholders/customers to take part, encourage sales, and so on. •Imagine an entrepreneur who just opened a restaurant or a small food boutique on a busy commercial street. In order to attract clients to her restaurant/boutique, the entrepreneur decides to offer free samples, or coupons for a free drink with the purchase of a meal. The samples cost something to produce and bring to the clients, just like the free drinks will also have a cost. Why not use these costs as indicators of the entrepreneur's affordable-loss commitments to get her business off the ground? Might this not represent a verifiable measure of her affordable loss on a day-to-day basis, as part of her effort to launch her business? Better yet, might it not be possible to track the form, scope, extent, and frequency of such investments over time? This data could then be compared across other case and/or correlated with the success obtained at attracting clients, breaking even, or even growing the restaurant(s). •Working along the same lines, one could follow an entrepreneur's decision to send custom-made prototypes or samples to a prospective buyer in a different city or country, thereby tracking his particular affordable-loss investments to develop his business (without the guarantee of sales). Similar measures could be developed for the development of innovative products or one's succession of effectual entries into different countries. •To the extent that it relevant, the extension of credit terms to buyers could also be examined as potential instances of affordable loss.
3. The lemonade principle (leverage contingencies) Expert entrepreneurs invite the surprise factor. Instead of making "what-if" scenarios to deal with worst-case scenarios, expert interpret "bad" news and surprises as potential clues to create new markets.	Acknowledging that this principle's contingencies and surprises cannot be predicted ahead of time, we here again encourage the use of more systematic retrospective techniques (structured interviews, event sampling, and so on) or, in this case, the use of longitudinal follow-ups with different ventures to "map out" the different "forks in the road" that arose during the development of a project.

Table 2 (continued)

Effectuation's five principles	Illustrative proposals for new means of observation
	•Working on that basis, we propose to examine the numbers of such unexpected learning events during the development of a project, their frequency, or the magnitude of the adjustments they imposed on the entrepreneurs' prior developments. •One could also investigate the kind of information signals that are most likely to trigger such changes (e.g., macro-economic or social crises / external shocks, sharp increases/decreases in external conditions, in employee turnover, in sales results, etc.)—or the salience/magnitude of such signals.
4. The patchwork-quilt principle (form partnerships) Expert entrepreneurs build partnerships with self-selecting stakeholders. By obtaining precommitments from these key partners early in the venture, experts reduce uncertainty and cocreate the new market with interested participants.	Building on similar data collection methods, we encourage finer-grained efforts to systematically "map out" the number of stakeholders/partners who are brought on along the focal ventures' development, as well as the form and/or frequency of their interactions with these ventures. Here again, the idea is to compound some sort of quantifiable data to investigate the impact of meaningful variations in the "patchwork" extent, across time and/or between different ventures. To the extent that it is defensible, one could even consider ascribing a monetary value to different cocreators' contribution(s).
5. The pilot-in-the-plane principle (control versus predict) By focusing on activities within their control, expert entrepreneurs know their actions will result in the desired outcomes. An effectual worldview is rooted in the belief that the future is neither found nor predicted, but rather made.	This fifth principle is arguably tricky, in large part because it does not lend itself spontaneously to particular behaviors but is more of an overarching guiding notion. Indeed, examinations of such principles were not included in Read et al.'s (2009) meta-analytic review, nor is it part of the dimensions included in the various survey measures by Chandler et al. (2011), Blauth et al. (2014), and Brettel et al. (2012), or in Reymen et al.'s (2015) carefully developed coding scheme (to cite but a few examples). Nevertheless, the principle's conceptual framing (as described on the left) suggests that useful avenues could be developed to examine the principle's import within an effectual mode of action. •For instance, might it not be possible to identify instances where entrepreneurs have a choice among different courses of action, and where these courses of action are characterized by affording different levels of control? •Conversely, a few studies have documented the unfolding "creation" of industries not on the basis of ex ante plans or analyses, but on the effective commitments of different entrepreneurs/cocreators. But what does this entail in terms of observable differences between industries/contexts? Are there cases of industry emergence that are *more* effectual than others—and if so, how so (and why)? These are the kind of questions upon which we would encourage further reflections. •Lastly, a number of studies have integrated the dimension of experimentation to their measures of effectuation (e.g., Chandler et al. 2011; Fisher 2012): on that basis, might it not be possible to measure and compare the extent to which one experiments? Might it not be possible to document the sums of efforts, resources, time or money invested in such experiments and use that as a measure of the pilot-in-the-plane principle?

Excerpted from http://effectuation.org/sites/default/files/documents/effectuation-3-pager.pdf

unfolding of these explanations (as opposed to simply reporting a "black box" correlation).

5.5 Effectually moving forward

Our three recommendations are largely convergent with Arend et al.'s (2015) suggested directions for future effectuation research (p. 644–6). Yet, we hope that our review of effectuation research's theory-and-method articulations helps clarify how to concretely pursue these authors' admonitions to move beyond descriptive studies of what entrepreneurs do to better explain why they do what they do—and why doing it this way may lead to important advantages. As such, we believe our recommendations might readily be used to answer Arend et al.'s (2015) call for radically transforming effectuation research "to address the question of how and when to go from cannot to can, and then focusing on the process of moving from can to do" (p. 646).

Effectuation research faces considerable challenges. Yet the ideas of effectuation remain powerful—and manifestly draw continuous interest from an ever-expanding circle of scholars around the world. Though some of the observations we made in our analyses raise concerns, enticing opportunities abound to contribute new insights about effectuation. We hope that the three avenues of future development we proposed above will inspire scholars to creatively advance academic understanding of effectuation.

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