Small, young firm flexibility and performance in the context of disruptive innovations

Sofy Carayannopoulos
School of Business and Economics,
Wilfrid Laurier University,
Waterloo, Ontario, N2L 3C5, Canada
Email: scarayannopoulos@wlu.ca

Abstract: Flexibility is a quality that is frequently associated with small, young firms. However, there has been limited attention given to understanding how flexibility is linked to small firm performance, and limited recognition that flexibility is costly and only advantageous in certain environmental contexts. This paper explores small, young firm flexibility advantages in the context of commercialising radical, architectural, modular, and incremental innovations. Multiple dimensions of flexibility are examined to identify the innovation regimes in which small, young firms may survive and succeed against larger, more established incumbents. The propositions developed extend understanding of the liabilities of newness, start-up performance and flexibility, and the displacement of incumbents by new firms.

Keywords: innovation; flexibility; start-up; liabilities of newness; learning flexibility; problem-solving flexibility; resource reconfiguration flexibility; network flexibility; incumbent displacement.

Reference to this paper should be made as follows: Carayannopoulos, S. (2017) ‘Small, young firm flexibility and performance in the context of disruptive innovations’, Int. J. Entrepreneurship and Innovation Management, Vol. 21, Nos. 1/2, pp.105–118.

Biographical notes: Sofy Carayannopoulos is an Associate Professor at the School of Business and Economics, at Wilfrid Laurier University. She holds an MBA and a PhD in Strategy and Entrepreneurship from Schulich School of Business at York University, as well as a Bachelor of Commerce and Economics and a Bachelor of Education from the University of Toronto. Her research has been presented at numerous conferences, including the Academy of Management and the Strategic Management Conference. In addition, her research has been published in Entrepreneurship Theory & Practice, Research Policy, the Reputation Review, and the International Journal of Knowledge, Culture and Change Management.

This paper is a revised and expanded version of a paper entitled ‘Organizational agility’ presented at ATINER Conference, Athens, Greece, 10 August 2009.
1 Introduction

Flexibility is a quality frequently associated with small, young firms and promoted as crucial for firm performance. However, limited attention has been given to the fact that

a flexibility comes at a cost (Fiegenbaum and Karnani, 1991)

b frequent change can threaten organisational survival (Shepherd et al., 2000)

c the extent to which flexibility is likely to lead to performance depends on the environmental context (Verdú-Jover et al., 2006).

With respect to the link between product innovation and performance, there are often contradicting recommendations or findings (Eisenhardt and Tabrizi, 1995; von der Heidt and Scott, 2012) which may be resolved by investigating the role of variables such as flexibility.

This paper begins to address these issues by exploring small, young firm (also referred to as start-up) flexibility and performance in the context of the commercialisation of disruptive innovations. Disruptive innovations are frequently pioneered by start-up firms, often (although not always) displacing incumbents (Christensen, 1997). Scholars have argued that this phenomenon requires further investigation (Adner, 2002; Carayannopoulos, 2009). We propose that the inherent and chosen characteristics of start-ups give them flexibility advantages compared to older incumbents in the mainstream markets the start-ups want to eventually enter. However, the extent to which their flexibility advantages will lead to success/ performance depends on the type of disruptive innovation the start-up is commercialising.

Synthesising a considerable body of literature on the liabilities of newness, organisational flexibility, and disruptive innovations, we develop propositions identifying the conditions in which start-ups may have an advantage over larger incumbents, and alternatively, when they do not. A potential criticism of the reliance on the synthesis of established theory may be that, individually, some of the propositions may not appear new. However, our work is distinguished from prior efforts and contributes to extant knowledge in several ways.

First, we examine four types of disruptive innovations – radical, architectural, modular, and incremental – thereby extending prior work that relied on the simple distinction between radical and incremental. Second, we expand on work that has focused on one or two dimensions of flexibility by simultaneously examining multiple dimensions of flexibility, and explore the effect of co-alignment between flexibility and the innovation context on performance in particular. Finally, we focus on small firm flexibility, innovation, and performance, thereby answering the call for more work in this area (Verdú-Jover et al., 2006), and extending understanding of start-up survival and success. Given how costly and challenging flexibility can be, particularly for start-ups, our paper helps managers understand when and what types of flexibility increase the likelihood of organisational success.

We begin with a brief literature review of small, young firm flexibility and disruptive innovations, followed by the development of propositions. The paper concludes with a discussion of implications.
2 Literature review

2.1 Small, young firm flexibility

The literature on young firms often describes them as entities whose survival is challenged by their lack of experience, lack of resources, and lack of legitimacy. Failure is frequently attributed to internal factors such as small size and organic structure due to limited financial resources and lack of experience, as well as external factors such as limited network resources (Freeman et al., 1983).

Despite the high failure rates of start-ups, researchers are noting that some liabilities of newness may also represent potential sources of advantage for young firms (cf. Autio et al., 2000; Carayannopoulos, 2009; Choi and Shepherd, 2005). We propose one such characteristic is flexibility.

Organisational flexibility is the ability of the organisation to adapt to environmental changes that have a meaningful impact on the organisation’s performance, and consists of a variety of dimensions such as R&D, finance, operations, and marketing (Aaker and Mascarenhas, 1984). Although it is assumed that start-ups are inherently more flexible than larger, older organisations, there has been limited theoretical exploration of the relationship between start-up flexibility and performance; most of the work has focused on large firms (Verdú-Jover et al., 2006). Notable exceptions are Autio et al. (2000) who found that the lack of ingrained routines and mindsets created by age and experience foster learning flexibility and allow the young firm to explore and learn faster or more easily than larger, older counterparts. Fiegenbaum and Karnani (1991) found that the organic structures associated with small firms create greater product output flexibility which could lead to superior performance in conditions of high demand volatility. Recently, researchers found that the co-alignment of flexibility dimensions with the demands of the environment has a stronger influence on performance in small rather than large firms (Verdú-Jover et al., 2006). Ebben and Johnson (2005) found that young firms who pursue either efficiency or flexibility in their manufacturing operations outperform those that try to pursue both objectives.

Our paper will examine the dimensions and performance implications of flexibility that are associated with characteristics that create liabilities of newness in the context of four types of disruptive innovations.

2.2 Disruptive innovations

A disruptive innovation is one that significantly changes the price-performance frontier. When it is first brought to market it is introduced in smaller, peripheral markets because it does not meet the needs of existing mainstream customers. Performance improves quickly until the product is able to enter the low-end segment of the mainstream market and move steadily up-market, sometimes displacing incumbent firms. However, the new entrants are not always successful because incumbent firms are sometimes able to react quickly enough to protect their markets (Christensen, 1997).

Innovations range from incremental to radical (Abernathy and Clark, 1988); architectural and modular innovations fall in the mid-range (Henderson and Clark, 1990). The four types of innovations are distinguished by the demands they place on change/flexibility in organisational knowledge assets and activities. Radical innovations employ a different set of scientific or engineering principles from existing products,
involving new components in a new product architecture. They consequently demand flexibility in both knowledge assets and organisational activities. An example of a radical disruptive innovation is Skype compared to traditional telephone communication.

Architectural innovations leave the basic knowledge of product function and the core design largely unaffected, but require flexibility in how the product components are linked together (Henderson and Clark, 1990). The desktop computer compared to the IBM mainframe is an example of an architectural disruptive innovation because it reconfigured familiar product components. Modular innovations retain the linkages between core concepts and components, but require substantial change in knowledge of some of the individual core concepts or components. The digital camera compared to the film camera is an example – the core concept and product design is the same, but the medium on which the image is stored has changed. Finally, incremental innovations build on incumbents’ existing product structure and knowledge. They extend the potential of existing designs, i.e., the addition of camera and music capabilities to cellular telephones.

We now move to the development of propositions on start-up flexibility and its effects when commercialising radical, architectural, modular, and incremental technological innovations. The relationships we develop in this section are shown in Figure 1.

**Figure 1** The relationship between flexibility dimensions and the likelihood of successful commercialisation by a small young firm – a proposed model

<table>
<thead>
<tr>
<th>Nature of Technology</th>
<th>Radical</th>
<th>Architectural</th>
<th>Modular</th>
<th>Incremental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning flexibility</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>NE</td>
</tr>
<tr>
<td>Problem-solving flexibility</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>NE</td>
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<tr>
<td>Resource reconfiguration flexibility</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Network flexibility</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>NE</td>
</tr>
</tbody>
</table>

**Impact of lack of flexibility**

++ = very significant advantage
+. = significant advantage
+ = some advantage
. = limited advantage
- = disadvantage
NE = no effect

Likelihood of successful commercialisation by small young firm
3 Proposition development

3.1 Youth and flexibility dimensions

The flexibility dimensions that are relevant to the commercialisation of disruptive innovations are learning, problem-solving, resource reconfiguration, and network. We explain below how the inherent and chosen characteristics of small, young firms are associated with each of these, and subsequently link them to four technological innovations and performance.

As organisations accumulate experience and build capabilities they develop standardised routines for information acquisition and utilisation (Hill and Rothaermel, 2003). It becomes increasingly more efficient to build upon existing knowledge rather than pursue new areas (Levinthal and March, 1993), and managerial cognition, biased by past experiences, constrains and directs learning efforts (Tripsas and Gavetti, 2000). Similarly, the longer the firm’s experience, the stronger the mental models and creative filters which limit problem-solving flexibility by causing the firm to ignore ideas that do not fit its mindsets (Galunic and Rodan, 1998).

Meanwhile, the reconfiguration of organisational activities is hindered by entrenched bureaucratic structures meant to stabilise those activities which successfully solved problems as the firm aged, and are configured around current strategies and products (Hannan and Freeman, 1984; Henderson and Clark, 1990; Leonard-Barton, 1992). Long-standing systems of action and communication create resistance to reconfiguration (Dougherty and Heller, 1994; Henderson and Clark, 1990). Finally, organisational networks become increasingly inflexible due to the vested interests, and the size, complexity, and network routines that develop over time and make integrating new partners difficult (Kim et al., 2006; Simsek et al., 2003).

Due to their lack of experience, young firms have not had the time to develop organisational decision rules, and routines that can be consistently reconstructed thereby increasing survival (Choi and Shepherd, 2005). However, they have greater learning flexibility because they have fewer knowledge paradigms and have devoted fewer resources to any particular knowledge path, making it easier for them both from a rational economic point of view and from a cognitive perspective to pursue new knowledge paths. The lack of learning routines and paradigms also allow the young firm to learn more quickly (Autio et al., 2000). Young firms also tend to engage in a wider information search than older firms (McGee and Sawyerr, 2003) thereby encouraging the pursuit of new knowledge outside of their current areas of expertise.

Start-ups are also more likely to possess more flexible problem solving because firms without a large repertoire of prior experience are often forced to improvise and experiment (Zahra et al., 2006). The lack of ingrained interaction patterns in start-ups also encourages cross-organisational sharing of ideas which is more likely to lead to creative solutions (Woodman et al., 1993).

Due to small size and lack of experience start-ups also tend to have organic structures. Employees perform a variety of tasks as needed because the start-up has not existed long enough to standardise activities and does not have the human resources to extensively divide labour. This challenges survival because it reduces efficiency, consistency, and replicability (Fiegenbaum and Karnani, 1991; Verdú-Jover et al., 2006). However, the lack of routines and greater proportion of labour to capital found in organic structures allows easier reconfiguration (Fiegenbaum and Karnani, 1991).
Similarly, the start-up’s network is smaller due to youth and perceptions that it has less to offer (Hite and Hesterly, 2001; Yli-Renko et al., 2001). Smaller size means fewer valuable linkages to draw upon for assistance. On the other hand, the lack of complexity, reciprocity, and vested interests provide it with a more flexible network because these factors hinder network change (Kim et al., 2006).

Consequently, compared to larger, older firms, start-ups are more likely to have greater learning, problem-solving, resource reconfiguration, and network flexibility.

3.2 Flexibility dimensions, four disruptive innovations, and performance

Disruptive innovations often combine existing but previously unconnected elements. They are characterised by significant and repeated performance improvements and movements into new markets. This requires the commercialising firm to be responsive to feedback, and creative. Furthermore, the firm must have flexibility in learning about the components and their integration, as well as making adjustments to organisational activities, problem-solving strategies (Abernathy and Clark, 1988; Henderson and Clark, 1990), and networks, particularly since it is not the first version of the innovation that will invade and satisfy the larger mainstream market.

Disruptive innovations are often commercialised by incumbent firms in reaction to start-ups entering their mainstream markets, sometimes successfully overpowering the new entrants (Christensen, 1997). We propose that the likelihood of start-up success when entering a mainstream market will be affected by the number and extent to which the dimensions of flexibility are affected by the disruptive innovation. The extent to which the established firm’s response is hindered due to flexibility challenges will determine the new entrant’s opportunity to capture mainstream market share.

3.2.1 Learning flexibility

The greatest amount of learning flexibility is demanded by radical disruptive innovations because they involve different and evolving areas of knowledge compared to the mainstream products. When faced with a radical innovation, the incumbent’s response is slowed by the unlearning which must first occur, and the substantial changes and additions it must make to its knowledge assets (Abernathy and Utterback, 1988; Christensen, 1997; Dougherty, 1990; Henderson and Clark, 1990). The time needed to accept and then build expertise gives the start-up a significant lead which persists as the innovation evolves.

A start-up with learning flexibility also has a significant advantage in the context of an architectural disruptive innovation. The incumbent’s learning response is delayed because it often underestimates the magnitude of changes it must make to existing knowledge until it has experienced significant failures in trying to respond (Henderson and Clark, 1990). As with a radical innovation, its response is also hindered by the filters, structure, and knowledge connection paradigms of the old architecture (Dougherty and Heller, 1994; Henderson and Clark, 1990). The start-up has already made these novel connections and its learning flexibility allows it to continue to develop new ones more easily than the incumbent. However, because the basic knowledge of the functioning components is similar to the incumbent’s existing knowledge, architectural innovations only require flexibility in connecting the knowledge components, thereby requiring significantly less learning flexibility in comparison to radical disruptive innovations.
Because modular innovations still require substantial new knowledge in some components, the start-up’s learning flexibility is somewhat advantageous. However, the bulk of an incumbent’s efforts is spent exploring modular improvements (Henderson and Clark, 1990), resulting in less resistance to acquiring the new modular knowledge, even if it is slower than the start-up in identifying the new area of knowledge exploration that should be pursued. Furthermore, integrating the new knowledge with the old is less challenging because the modular innovation does not challenge the existing connections between components and organisational activities, making it easy for the incumbent to respond and overtake the start-up.

Incremental innovations build on product knowledge the incumbent firm already possesses, seeks, and finds valuable. Since the large incumbent is likely to possess greater absorptive capacity compared to the start-up, the incumbent will have a significant advantage in quickly and better acquiring the knowledge demanded by the incremental technology. Consequently:

**Proposition 1** The start-up’s learning flexibility is likely to provide it with very significant advantage in the context of a radical disruptive innovation, some advantage in the context of an architectural innovation, limited advantage in the context of a modular innovation, and no advantage in the context of an incremental innovation.

BlackBerry (BB – then Research In Motion)’s development of the BlackBerry illustrates learning flexibility. Motorola, then a leader in pager and cellular telephones, viewed the pager market as mature and wireless PDA’s as technically infeasible. Like most industry incumbents, Motorola focused on developing knowledge in voice communications. Lazaridis, the CEO of BB, viewed wireless data as the future and the obstacles merely an engineering challenge, and focused on learning about it. As a result, by the time Motorola and other incumbents recognised the value of what BB had created, BB had established itself as a leader and dominant player in the lucrative business enterprise market. However, since its innovation was basically modular it did not succeed in displacing Motorola and other cellular telephone manufacturers.

### 3.2.2 Problem-solving flexibility

Problem-solving flexibility is the ability to develop novel solutions and ideas. This type of flexibility is central to the creation of disruptive innovations. Furthermore, as the innovation evolves, new problems demanding novel solutions are likely to arise.

A radical innovation demands the greatest amount of problem-solving flexibility because it requires the ability to question strategic activities and challenge existing organisational approaches, and an openness to novel solutions (Hill and Rothaermel, 2003; Simsek et al., 2003). It is more likely to be discovered when multiple alternatives are considered, rather than pushing for ‘one’ best solution (Simsek et al., 2003). The young firm’s openness to new ideas, its broader experimentation due to its lack of experience, its cross-functional knowledge- and idea-sharing, and the absence of ingrained mental models and industry paradigms increase the likelihood of novel solutions being discovered, accepted, and pursued as the innovation evolves.

Architectural innovations require somewhat less problem-solving flexibility because they require novel configurations of previously-known components or knowledge. However, the problem-solving flexibility demanded by architectural innovations is
challenging for incumbent firms because they have difficulty legitimising the new configurations represented in architectural innovations (Dougherty and Heller, 1994; Henderson and Clark, 1990). They must overcome organisational routines and structures that limit interactions between members and areas of the organisation (Galunic and Rodan, 1998) so that new connections can be discovered and accepted. The start-up’s non-routinised interaction gives it a comparative advantage in commercialising and advancing an architectural innovation. However, this flexibility advantage is not as large as with a radical innovation because the flexibility needed does not extend to developing new approaches to components.

With modular innovations, the problem-solving flexibility required to develop them involves only one component, albeit an important one, within a larger system. The new perspectives and cognitive leaps needed are not beyond the reach of an established firm, because it too is constantly seeking improvements in its components. The flexibility advantage of the young technology-based venture stems primarily from its more intimate understanding of market needs and the fresh perspective it gains from its environmental scanning. Consequently, the young firm has a smaller flexibility advantage when commercialising a modular versus architectural innovation, and this advantage can be easily overcome by an incumbent.

Finally, with respect to incremental innovations, although they do not call for dramatically new science, they often require considerable ingenuity (Henderson and Clark, 1990). Because incremental innovations involve the synthesis of knowledge and ideas that build on existing capabilities rather than radical ideas and approaches, the established firm’s problem-solving flexibility is sufficient to address and develop these innovations. Consequently, although the start-up may bring some fresh solutions to the innovation, it is highly likely that these ideas would have also come to the incumbent.

Proposition 2 The small young firm’s problem-solving flexibility is likely to provide it with very significant advantage in the context of a radical disruptive innovation, significant advantage in the context of an architectural innovation, some advantage in the context of a modular innovation, and no advantage in the context of an incremental innovation.

Netflix and its disruption of BlockBuster is an example of problem-solving flexibility. BlockBuster had a ‘landlord’ mindset in approaching the problem of reaching movie-renting customers. They set up many locations to make it convenient for customers to reach them, and thus created a barrier to entry. They also dealt with the issue of ensuring movies were returned by using significant late fees. Netflix took an ‘all you can eat’ and ‘subscription’ view, reduced costs by mailing movies to customers, and charging a flat monthly subscription fee. Late fees were also removed but customers had a limit on the number of movies that could be held, requiring them to eventually return movies in order to receive more. It entered the market at the low end, serving customers who did not mind waiting to receive a movie rather than picking it up immediately. As technology evolved, it solved this problem by enabling on-demand rentals through the internet, and also solved the problem of customers wanting advice on what to rent by being among the first to develop a recommendations engine that helped customers find new movies based on others they had enjoyed. This radical disruptive innovation resulted in the demise of BlockBuster.
3.2.3 Resource reconfiguration flexibility

Disruptive innovations demand significant resource flexibility because it is often not the first version of the innovation that enters the incumbent’s mainstream market. Radical innovations render the incumbent’s structure obsolete because they involve new components in a new architecture (Henderson and Clark, 1990). Organisations with bureaucratic structures, particularly those that have operated in a stable environment for a significant period of time, are more likely to fail in the face of a radical innovation because they face significant challenges in reconfiguring their resources. The start-up’s resource reconfiguration flexibility is consequently of greatest advantage in the context of a radical innovation. It is able to configure and readjust its activities as the product evolves due to its lack of entrenched patterns of activity and communication.

Architectural innovations demand changes to the linkages between the expertise of different functions of the organisation. Reconfiguration is hampered because the incumbent underestimates the magnitude of changes it must make to existing structures until it has experienced significant failures in trying to respond. As with a radical innovation, it is also challenged by the need to learn about and develop a new architecture, and redefine work roles and relationships (Dougherty and Heller, 1994), all of which are hindered by the existing filters and structure of the old architecture (Henderson and Clark, 1990). Creating legitimacy for unfamiliar practices and structures alone is a time-consuming and uncertain activity (Aldrich and Fiol, 1994).

Modular innovations retain the linkages between components, although some adjustments may be needed to accommodate the change in the components themselves. They therefore pose only a slight challenge to the incumbent. The resource reconfiguration flexibility of the start-up is thus an advantage only insofar as being able to more quickly accommodate the modifications demanded by the component.

In contrast to all of the above, incremental innovations strengthen and benefit from the existing firm structure (Abernathy and Clark, 1988); incumbents place a strong emphasis on incorporating incremental innovations (Henderson and Clark, 1990). With an incremental innovation, the start-up’s resource reconfiguration flexibility is of no advantage. Indeed, it may be a disadvantage because the firm is sacrificing efficiency for a flexibility that is not strategically valuable (Verdú-Jover et al., 2006).

Proposition 3 The small young firm’s resource reconfiguration flexibility is likely to provide it with very significant advantage in the context of radical and architectural disruptive innovations, some advantage in the context of a modular innovation, and no advantage to disadvantage in the context of an incremental innovation.

The case of Apple versus IBM illustrates this proposition in the context of an architectural innovation. IBM had the knowledge of the components, but its activities were focused on producing large mainframes for business customers. By the time it legitimised the need for and executed the reconfigurations of its activities, Apple had become established in the consumer market as a dominant standard. It has slowly moved into the business market, but because IBM did respond with its own PC targeted to its business customers, it was able to survive Apple’s threat.
3.2.4 Network flexibility

Network flexibility is central to commercialising disruptive innovations because these innovations are first introduced and evolve in peripheral markets and move into new, larger, mainstream markets as they change. Accessing new suppliers and distributors is very important as products and markets evolve. Relationships with existing mainstream customers, and the disincentives to pursue smaller, riskier markets in particular have been shown to hinder the commercialisation of disruptive innovations by large, established firms (Christensen, 1997). However, each type of disruptive innovation requires varying degrees of network flexibility.

Radical innovations require the most substantial network flexibility because in addition to originating and developing in peripheral markets, the change in components require the development of new suppliers (Abernathy and Clark, 1988). Architectural and modular innovations also force the incumbent to seek new relationships, although to a lesser extent. Finally, incremental innovations do not require the procurement of a significant amount of dramatically new resources, and benefit from the incumbent’s existing supplier and customer network (Simsek et al., 2003).

The young firm’s network flexibility creates a substantial advantage when it is commercialising a radical disruptive innovation because a network characterised by weak relationships allows actors to build relationships with multiple disconnected clusters and is less likely to constrain the firm’s ability to undertake radical change in its relationships (Simsek et al., 2003).

With respect to architectural and modular innovations, the young firm’s network provides it with some advantage compared to incumbents. An embedded and long-held network creates a ‘technological traditionalism’ among network members because it socialises them to shared mental frameworks and paradigms (Simsek et al., 2003). The start-up’s network flexibility allows it not only to more easily change its suppliers to obtain the needed components, but also more easily identify and consider valuable component changes in the first place.

With respect to incremental innovations, the young firm’s network flexibility is of no advantage. The cognitive similarities created by firms embedded in established networks positively influence the success of the firm pursuing incremental innovation by increasing the efficiency of intra-network communication (Simsek et al., 2003).

Proposition 4 The small young firm’s network flexibility is likely to provide it with very significant advantage in the context of a radical disruptive innovation, some advantage in the context of an architectural and modular innovation, and no advantage in the context of an incremental innovation.

Skype’s disruption of mainstream wire-line telephone services is an example of the advantage of network flexibility in the context of a radical innovation. Skype’s product involves a completely different network of customers (those that use computers for communication) and, more importantly, complementary goods suppliers. Its suppliers are software developers and computer hardware producers, rather than telephone manufacturers. Bell, a dominant incumbent in the market, was constrained by the fact that it had a large network of existing consumers and the related physical assets it had to maintain. It chose to migrate to the more lucrative business enterprise. However, as
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Skype’s performance is improving, it will enter the business sector as well, or at least steal market share for video conferencing and other services.

4 Discussion and conclusions

Flexibility requires willingness to change, resources, and time. The incumbent has the financial resources, but obtaining non-financial resources such as knowledge and network connections, and legitimating and making the needed changes take time – time during which new entrants are improving their products and establishing themselves in the incumbent’s mainstream market with their disruptive innovations.

The propositions developed in this paper theoretically explore how start-up flexibility may be advantageous when commercialising disruptive innovations. It consequently addresses the need for further exploration on the displacement of incumbents by disruptive innovations (Carayannopoulos, 2009), and more theoretical efforts on the effects of flexibility on small firm performance (Verdú-Jover et al., 2006). It also extends previous work on inherent young firm advantages (Autio et al., 2000; Carayannopoulos, 2009; Choi and Shepherd, 2005). In examining four types of disruptive innovations, we also address the need for more work on the mid-range of disruptive innovations in addition to the extremes of radical and incremental.

The theoretical implications of this paper are that start-ups commercialising disruptive innovations are more likely to be successful and displace incumbents when commercialising radical and architectural innovations due to flexibility advantages. The changes demanded by these innovations slow the incumbent’s response, allowing the start-up greater time and opportunity to establish itself in the mainstream market. Their flexibility advantages are not as large when pursuing modular innovations – the incumbent can respond more quickly, reducing the chances of success. When pursuing incremental innovations not only does the small young firm’s flexibility not aid its chances of success, it may actually diminish them.

There are also several managerial implications that can be derived from the insights of this paper. As Covin et al. (1999) argue, the best tactical determinants and discriminators will vary with the environment. Specifically, flexibility must be co-aligned with environmental demands in order to lead to performance (Fiegenbaum and Karnani, 1991; Verdú-Jover et al., 2006). We propose that a start-up commercialising a disruptive innovation must recognise the characteristics and flexibility demands of the innovation it is commercialising, and compare these to the flexibility of incumbents to determine its competitive advantage.

The start-up should seek markets where its flexibility compared to incumbents will allow it to become established before the incumbent can respond. In conditions where the incumbent is able to respond quickly (i.e., modular or incremental disruptive innovations), the start-up it is better off staying in smaller, peripheral markets until its innovation is fully developed and the organisation itself is stronger, and even then should consider entering the mainstream market through an alliance or supplier relationship with the incumbent to discourage the incumbent from creating its own version of the innovation. The propositions developed also imply that the young firm should try to strategically manage its flexibility. It should actively foster it, even at the expense of efficiencies, when it is pursuing a radical or architectural innovation. On the other hand,
more structure and organisation that increase replicability (but reduce flexibility) are beneficial when pursuing modular or incremental innovations.

For the large, mature firm the propositions developed here can be useful in understanding when it should try to emphasise flexibility, or perhaps partner with a young firm to benefit from its inherent flexibility. For example, when a new breakthrough is desired or appears to be looming, the large firm should either begin to seek small, young organisations or engage in activities such as skunkworks or semi-independent small divisions that mimic the characteristics of the creative young firm.

The insights of this paper can be applied to addressing the debate surrounding the benefits of flexibility, and dynamic capabilities. Zahra et al. (2006, p.918) defined dynamic capabilities as “the abilities to reconfigure a firm’s resources and routines”. The similarity to definitions of flexibility is notable. In their paper, Zahra and colleagues noted that dynamic capabilities may be less valuable, and indeed, may be detrimental to performance in environments where adaptation of resources is not competitively valuable. Ebben and Johnson (2005) showed that flexibility and efficiency are at odds with each other, and Fiegenbaum and Karnani (1991) showed that flexibility does not necessarily lead to performance. By examining the environmental context created by four types of disruptive innovations, this paper may help identify the contexts in which flexibility in general is likely to be beneficial, in addition to helping firms better choose the markets and industries they might succeed in.

Finally, there are a few long-standing debates that this paper is relevant to. One is who is likely to perform better (pioneers or late movers), and what qualities a successful pioneer must have. Covin et al. (1999) show that pioneers versus followers have different advantages in hostile versus benign environments. Our model extends this by considering flexibility and the nature of the innovation to predict whether the pioneer (start-up) or follower (incumbent) is likely to succeed – and what market choices a start-up firm may take to increase its chances of success when pioneering a disruptive innovation. Another debate is whether relationships with customers aid in innovation performance. von der Heidt and Scott (2012) recently showed that customer relationships do not predict innovation performance, and Christensen (1997) argues they can hold firms back. We believe the differences are resolved by recognising which type of innovation is desired and whether new stakeholders are needed.

As stated in the introduction, flexibility, innovation, and the phenomenon of large firm displacement by start-ups are interesting and relevant to understanding the challenges and advantages of youth versus experience, and the effects innovation and flexibility have on start-up performance and competitive advantage. We believe that the arguments developed in this paper offer a starting point by providing some new insights into these factors, and are relevant to both young and established firms.
References


Notes
1 We specifically examine disruptive rather than sustaining innovations since sustaining innovations are most likely to be successfully commercialised by established firms (Christensen, 1997).