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Essays on Organizations and Competition

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Essay 1

ABSTRACT

How organizations perform in and react to an increasingly competitive environment has been a longstanding topic in the strategic management literature. The goal of my dissertation is to examine important research questions with respect to competition and its implications for organizations, such as *which competitive positions are more vulnerable to competition?* And *which strategies help firms to effectively react to competition*? I address these questions in three essays on organizational decisions in response to competition through adopting various strategies –namely positioning, technology, and non-market strategies.

In the first essay, I look at the role of market frictions in changing the relative advantages of specialist and generalist competitive positions. In this essay, I show how firm positioning affects its performance through the value created for the customer. By developing a formal model, I propose that generalists can enhance customer value by providing her with the flexibility to change across firm multiple value propositions. In settings where switching costs are low or not relevant, generalists create less value for the customer and therefore are outcompeted by specialists. I empirically test this proposition in the mobile communications industry and draw on a unique policy change that exogenously decreases customer switching costs.

In the second essay, I juxtapose different types of competition –for resources and markets– to study when and how subsidiaries of global firms adopt a new technology. I propose that the timing of adoption of the focal subsidiary depends on competition that it faces within the organization and from the local environment. My findings reveal contrasting effects for competitive forces that the focal subsidiary experiences from its peers in the MNC network and from other firms in the local environment. The extent to which the new technology has already been adopted within the firm delays the focal subsidiary's adoption because of competition for firm resources. On the other hand, the extent to which the technology has already been adopted by rivals in the host country accelerates the focal subsidiary's adoption, as the subsidiary counters rival efforts to maintain its competitive position. I test these propositions in the context of national subsidiaries of global telecommunications firms, adopting 4G technology.

My third essay looks at how firm aspirations, driven from its competitors' performance as well as its past performance, can shape the decision to engage in non-market strategies such as corporate social responsibility. Building on the performance feedback theory, I propose firms are more likely to increase their engagement in socially responsible initiatives when they exceed their financial objectives (over-perform relative to a predetermined aspiration level). The positive effect of over-performance on CSR engagement is amplified when firms are operating in countries in which regulatory, normative and cognitive institutions demand, trigger and incentivize actions that are viewed as socially responsible. I empirically test my propositions in a sample of global firms across different industries.

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Mom, this is for you: without you, I would not be the person I am today. Looking at you, an independent and successful woman who has built her life, made me believe that I am able to accomplish what I want. Thank you for your unconditional support and pushing me forward to achieve my goals. I would like to dedicate this dissertation to you.

Essay 1

Rethinking Competitive Positioning: Customer Value, Flexibility, and Generalist Advantage

ABSTRACT

This paper contributes to prior research on firm positioning by bringing in demand-side factors. In particular, we develop a formal model to show how an important, yet often overlooked demand-side contingency –customers switching costs– can affect the relative advantage of generalists and specialists positions. In this regard, we suggest that generalists have an advantage in comparison to specialists since they provide an ex-ante flexibility for customers to change between multiple firm offerings without switching service provider. Such flexibility is particularly valued in the settings where customer switching costs are high. We hypothesize that generalists lose this advantage, and grow less in comparison to specialists, once customer switching costs fall. We test our hypothesis using a sample of Latin American mobile communications carriers from 2003 to 2015. In particular, we draw on an exogenous policy change (mobile number portability) that suddenly decreases customer switching costs. Using a differences-in-differences methodology allows us to estimate the causal effects of competitive positioning on firm performance in different demand settings. Our results reveal that generalists grow less in comparison to specialists after the policy change.

Keywords. Competitive positioning, customer value, flexibility, mobile number portability

1.1. INTRODUCTION

The question of *how competitive positioning can affect firm performance* has been among the most intriguing areas of research in the strategic management literature (Levinthal, 2016). Prior research has explored the performance implications of competitive positioning by focusing on concepts such as cost advantage, profit margin, market reach, and innovativeness, and responsiveness to technological shifts, to name a few (e.g., Porter, 1980, 2008; Semadeni, 2006; De Figueiredo and Silverman, 2007; Benner and Waldfogel, 2016; Wang and Shaver, 2016). Despite the widespread scholarly interest in firm positioning, extant studies mainly adopt a firm-centric lens focusing on value capture mechanisms (Priem, 2007). This insufficient attention to incorporate demand-side factors in the positioning school of strategy is quite surprising, considering the critical role that customers play in where firms position in an industry (Adner, Ruiz-Aliseda, and Zemsky, 2016, Adner and Zemsky, 2006, Priem, Li and Carr, 2012).

This paper attempts to fill this gap in the literature by developing a formal model based on the customer value and exploring the demand-side factors that can favor generalists over specialists or vice versa. We focus our attention on an important contingency related to the demand-side –i.e., customer switching costs, and explore how this contingency can affect the value propositions offered by generalists and specialists. In our suggested model, we compare the customer utility gained through generalist offerings vs. customer utility gained through specialist offerings. We argue that generalist's value creation can occur through an ex-ante flexibility provided to customers that enables them to change between the firm's several offerings without switching provider. As a result, we propose that in settings in which the cost to switch between service providers is low generalists lose their key advantage and underperform specialists.

To test our proposition, we draw on the mobile communications industry in emerging markets. In this setting, generalists offer a mix of postpaid and prepaid services, while specialists mainly provide one service or the other. Since the choice of positioning is endogenous –i.e., it can be affected by firm resources and capabilities or market segmentation, we need to tease out the endogeneity problem between positioning and firm performance. Our identification strategy relies on an exogenous policy change –i.e., mobile number portability (MNP) that allows customers to change their service provider without incurring high switching costs. Using a differences-in-differences methodology, we compare the performances of generalists and specialists before and after the policy change. This exogenous source of variation enables us to address the endogeneity problem between competitive positioning and firm performance (Adner, Ruiz-Aliseda and Zemsky 2016). Our results reveal that generalists grow less in comparison to specialists after the policy change. This underperformance is because generalists lose their key advantage (ex-ante flexibility) following to a sudden drop in customer switching costs.

Our study makes several contributions to the strategic management literature. This paper provides a better understanding of the specialist vs. generalist dilemma (Axelrod, 1997; Carroll, and Hannan, 2000) by introducing a relevant market friction–i.e., customer switching costs. Our proposed model can be extended to other industries in which the value of services or products are not immediately observable and where the ex-ante flexibility to change between offerings (without switching provider) is relevant for customers. Through explicating the role of customer value, this paper can help managers in their positioning decisions.

We begin the paper with a brief review of the literature on competitive positioning. Next, we develop our model, introduce the hypothesis and describe our empirical setting, and statistical

method. Then, we present the findings of our empirical analyses followed by several robustness checks. We conclude with a discussion of our results, limitations, and implications for future research.

1.2.THEORETICAL BACKGROUND

Competitive positioning refers to the choice of firms on where to position within an industry. Porter (1980, 1985) argues that firms can be specialists by adopting one of cost leadership or differentiation strategies. In this sense, a specialist position means that firms focus their activities just on specific market segments. On the other hand, generalist firms pursue both strategies at the same time. Thus, a generalist position necessitates expanding the scope of firm activities to serve multiple market segments. Firms decide where to position in an industry based on their resources and capabilities as well as their external environment. For example, specialist positioning requires process engineering skills, tight cost control, low-cost distribution system, and access to capital for cost leadership approach vis-à-vis strong marketing abilities, product engineering skills, creativity and research capability for differentiation approach. A generalist positioning, on the other hand, requires a combination of the capabilities above that could be directed at a particular strategic target.

Like many other strategic choices that firms make, the choice of positioning has certain implications for firm performance (Miller, 1988; Yamin, Gunasekaran, and Mavondo, 1999; Ward, Bickford and Leong, 1996). Specialists benefit from stronger market share and higher revenue in market niches, enhanced reputation in their area of specialty, and more streamlined offerings. Generalists, on the other hand, can benefit from higher economies of scale and address wider customer segments. Porter (1980, 1985) concludes that firm that attempts a generalist

position might be "stuck in the middle", and therefore, outcompeted by specialists. The reason is that generalists that adopt both strategies will fail to tailor value propositions that meet customer needs.

A careful review of the firm positioning literature and other dominant perspectives such as transaction costs economics and resource-based views (Porter, 1980, 1985; Ghemawat, 1991; Brandenburger and Stuart, 1996) reveals that prior research mainly adopts a firm-centric lens to the study of firm positioning and disproportionally explains firm profitability via value capture (Makadok and Coff, 2002). There are important, yet not fully explored considerations on competitive positioning –i.e., demand-side factors (Adner and Zemsky, 2006, Priem, Li and Carr, 2012) that can help to better understand the causal mechanisms between firm positioning and its performance. Indeed, incorporating customers into the firm's value system is critical for producing sustainable competitive advantage (Priem, 2007).

There are two main ways by which competitive positioning can affect customer's perceived value– (1) by the degree of fit between firm value propositions and customer needs, and (2) by the degree of flexibility the firm provides for its customers through its offerings. First, specialists can outcompete generalists because of their better capability in tailoring value propositions that meet customers' needs and expectations. This higher capability is because of a closer attention that managers in specialist firms can devote to needs of customers. Notably, this issue becomes very important when there is higher demand heterogeneity (Adner, Ruiz-Aliseda, and Zemsky, 2016). A higher demand heterogeneity increases the diversity of customer needs. Therefore, specialists could be able to better focus on each market niche with a specific set of needs. Building on this idea, Adner, Ruiz-Aliseda and Zemsky (2016) present a formal

equilibrium model that suggests specialist positions provide a better-fitted value proposition for customers. On the other hand, generalists are usually more focused on benefits gained through economies of scale. The second consideration, which is the focus of this paper, is the degree of flexibility that firms provide their customers with through their offerings. In this sense, generalists provide customers with higher flexibility by offering a more diverse set of products and services. This flexibility is particularly important when customers have difficulty to observe and judge the value associated with firm offerings *ex-ante*. This difficulty in perceiving the real value of a service or product can raise from intangible elements, such as quality, and functionality that are not perceivable before actual consumption.

Generalists provide customers with the flexibility to change across their offerings as they create an *internal market* within the firm (e.g., Liebeskind, 2000; Kaye and Yuwono, 2003). In this sense, if customers are not satisfied with their choice of service or product ex-post, they do not have to switch their provider and incur high switching costs – they can simply change to another service or product offered by their current provider. This benefit that generalists offer is particularly valuable when customers switching costs are considerable. Switching costs refer to all the costs that customer has to incur once he or she changes its current provider (Klemperer, 1995; Beggs and Klemperer, 1992; Burnham, Frels, and Mahajan, 2003; Farrell and Shapiro, 1988; Farrell and Klemperer, 2004). This concept, therefore, can be applied to all the situations in which a consumer has already bought and used a service or product from a specific provider. The presence of switching costs can influence customers repeated purchases of a particular service or product (Weiss and Heide, 1993). In this sense, a previous purchase imposes a switching cost on customers to buy that service/product from another firm, even if the two firms' service/product

are identical. Thus, when switching costs are high, generalists have a relative advantage in comparison to specialists since they offer the flexibility of changing across firm's several offerings without a need to switch provider.

1.3. HYPOTHESIS DEVELOPMENT

As discussed, we propose that generalist firms can act as an internal market for their customers. In this sense, customers that purchase from generalists are rewarded with the flexibility to change across firm offerings. Considering that in many cases customers cannot observe the value of what they buy unless they consume it (e.g., experience goods or services), depending on the amount of customer switching costs, having the flexibility to change across offerings can play an important role in selecting generalist as a provider. Therefore, we propose that in the settings where customer switching costs are low or not relevant, generalists are outcompeted by specialists. This underperformance is because the key advantage of generalists is not valued anymore. Indeed, when switching costs are low, customers can easily switch their product or service providers without incurring a high cost. Thus, customers prefer to select specialists over generalists since specialists can offer highly tailored value propositions.

1.3.1. The model

We develop a formal model to obtain the customer utility in a two-stage game. Our model is an extension of the vertical differentiation model in the industrial organization literature to formalize firm positioning (see Tirole, 1988). The key assumptions of our model are: (1) the customer utility depends on the match between the purchased product and her expectations, (2) customers are heterogeneous in their ability to select ex-ante which product fits their needs, (3) the generalist advantage is to propose multiple offerings allowing customers to change across

offerings ex-post without incurring high switching costs. We demonstrate the model in two specifications in which customer selects between specialist offerings and generalist offerings. First, we characterize the customer utility in a one-stage game and then, we introduce the probability of changing or switching between offerings in a two-stage game. To conclude, we compare the customer utility gained through choosing specialists vs. generalists in the two-stage game.

1.3.2. Customer utility

The utility that customer i gains (u_i) depends on two conditions: (1) whether there is a match between the purchased product and her expectations, and (2) the probability that she is able to select the right product. There are two types of products (i,j) each resulting in a certain value for the customer (θ_i, θ_j)[1]. We assume that generalists offer both products, while specialists only offer one product or the other[2]. We assume that if customer i selects the product that matches her needs (i.e., product i), she will experience a higher value ($\theta_i > \theta_j$). In the first period, customer faces an uncertainty in choosing among firms and their offerings because of difficulty in judging the fit between her expectations and the product ex ante. Remember that this uncertainty is considerable when the customer purchases an experience good or a service. With the probability p_i customer i chooses the product with value θ_i that fits her expectations and with the probability $(1 - p_i)$ she selects the product with a lower value (θ_j). We assume that there is heterogeneity in customers' ability to select ex-ante which product fits their needs better (p_i). In addition, we assume that

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[1] Our assumption is that an identical product, say product i, generates the same utility for the customer regardless of its provider (generalist or specialist)

[2] θ_i and θ_j represent the net utility gained inclusive of prices and qualities. The two products, for example, might differ in terms of quality or price. One product could be a premium quality, high price variety, while the other is the opposite.

customer receives a one-time only benefit (E) from choosing the specialist in the first period because of its premium quality (Porter 1980). Thus, the utility that customer i gains in the first period is:

$$u_i(t = 1) = \begin{cases} p_i(\theta_i) + (1 - p_i)(\theta_j) + E \, , \ Customer \ selects \ Specialist & (equation \ 1) \\ p_i(\theta_i) + (1 - p_i)(\theta_j) \quad \ , \ Customer \ selects \ Generalist & (equation \ 2) \end{cases}$$

Next step is to incorporate the cumulative value that customer i obtains in a two-stage game. In the second period, there is no uncertainty regarding the product that meets the customer's expectations since she has already experienced the product in the first period. Say that customer i with probability $(1 - p_i)$, in the first period, selects a product that does not fit her expectations and needs. Depending on whether she has selected a specialist or a generalist two scenarios can be expected. If the customer purchased from a specialist in the first period, then she has to incur a switching cost (C) in the beginning of the second period to switch to a product offered by another specialist that meets her expectations. At this point, the customer does not have any incentives to switch to the generalist because she has discovered the right type of product that works best for her. Therefore, she prefers to select the right product from specialist providers and enjoy additional utility (E). Also, note that switching to a product offered by another specialist provider makes sense as long as the difference in perceived value is bigger than or equal to the incurred switching cost ($\theta_i - \theta_j \geq C$). If the difference in perceived value is less than the incurred switching cost ($\theta_i - \theta_j < C$), then the customer prefers to keep the existing product even if it does not exactly meet her expectations. For simplicity, we focus just on the first case where perceived value after switching to another product is bigger than or equal to the incurred switching cost.

The situation, however, will be different if the customer did not purchase the right

product in the first period but she selected a generalist provider. In this case, she can simply

select the right product in the second period that fits her expectations and creates a higher value

for her (θ_i). In this scenario, the internal market in generalists enables the customer to change

offerings without incurring high switching costs[3]. Considering these two scenarios, the customer

will perceive the following utilities from selecting specialist or generalist offerings ex-ante

(before purchasing offerings):

$$u_i(t=2) = \begin{cases} p_i(\theta_i) + (1 - p_i)(\theta_j) + (\theta_i) - (1 - p_i)C + E & , \; Specialist \; (equation \; 3) \\ p_i(\theta_i) + (1 - p_i)(\theta_j) + (\theta_i) & , \; Generalist \; (equation \; 4) \end{cases}$$

Thus, the consequences of customer choice between generalist and specialist can be

explained by comparing the utilities gained through equation 3 *vs.* equation 4. We assume that

customers are heterogeneous in p_i, and that this parameter is uniformly distributed between [0,

1]. To find the demand for generalist, we calculate the indifferent customer – one that gets the

same utility from generalist and specialist providers. Putting the difference between the utilities

gained from choosing generalist (equation 4) and specialist (equation 3) equal to zero leads to the

following equation:

$$(1 - p_i)C - E = 0 \hspace{4cm} (equation \; 5)$$

Solving equation 5 for p, we have $P^* = 1 - {E}/{C}$ which represents the location of

indifferent customer as well as the generalist's market share in equilibrium. If $p_i < \left(1 - {E}/{C}\right)$,

then the customer chooses generalist. Assuming that E is constant, as C approaches E the

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[3] Our assumption is that customer does not incur a switching cost within a generalist to change her product in the second period. In reality, the customer might experience a switching cost, but it is fair to say that this cost is negligible comparing to that of when switching between firms.

probability that customer chooses generalist decreases[4]. As predicted, an exogenous decrease in switching costs C reduces the generalist's market share. A graphical representation of the changes in generalist market share is illustrated in Figure 1. Based on our formal model, we propose that an exogenous decrease in switching costs reduces the number of customers who select generalist service providers. In this sense, we expect that generalists experience a negative effect in terms of firm growth after the reduction of switching costs comparing to specialists. In other words, the share of new customers who select a generalist firm in equilibrium decreases as C diminishes[5]. Taken together, we propose:

Hypothesis: Subsequent to a sudden decrease in customer switching costs, generalists will grow less in comparison to specialists.

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INSERT FIGURE 1 ABOUT HERE
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1.4. EMPIRICAL CONTEXT AND METHODOLOGY

1.4.1. Research setting

The empirical application of this research is carried out in the Latin American mobile telecommunications industry. The sample includes 26 mobile carriers in 10 Latin American countries[6] over the period of 2003 to 2015. Using this setting as the context of our analysis is particularly appropriate for several reasons. First, the focus on one specific industry gives the opportunity to narrow down the most common competitive positions that firms choose. In the

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[4] For simplicity reasons, we assume that E is smaller than C and $C \neq 0$.

[5] The presence of organizational frictions, as an assumption behind our model, are necessary to explain why companies do not change position immediately after the policy change.

[6] The countries in this study include Brazil, Mexico, Colombia, Chile, Ecuador, Argentina, Dominican Republic, Honduras, Guatemala, and Salvador that together represent more than 90% of the total mobile connections in Latin America

telecommunications industry, we are able to identify two competitive positions of generalist and specialist based on firm revenue models. In our setting, we note that some firms have a mix of prepaid and postpaid services (i.e., generalists), while others have a preponderance of one service or the other one (i.e., specialists). Drawing on the Latin American setting provides us the opportunity to study both positions of generalist and specialist, while in many other regions we are mainly able to observe specialists (e.g., in North America most firms are specialized in postpaid services, or in Africa most firms are specialized in prepaid services). Second, since the value of services that mobile carriers offer is not observable ex-ante it is possible to explore how much flexibility of being able to switch between firm offerings matters for customers. Lastly, the sample includes the Latin America mobile industry which has been identified as the second fastest growing region in the world's mobile market with a 9% growth rate in 2012. Notably, this market accounts for 10% of the revenues in the global mobile segment (GSMA Intelligence report, 2013). Additionally, the policy of mobile number portability that suddenly changes customer switching costs is implemented within the period of study across different countries. The first country to implement this policy is Brazil in 2008. Furthermore, Latin America provides us with enough country-level variation in population and size, consisting of large countries, like Brazil as well as smaller countries, such as Honduras. Lastly, using one specific region gives us a more comparable sample in terms of the stage of technology. Prior research suggested that technology stages in a region (reflected in communications standards such as GSM or UMTS) tend to be more homogenous within a region than across different regions (Gomez and Maicas, 2011; Gandal, 2002; Gruber, 2005).

In order to define competitive positions of generalist and specialist, we draw on firm offerings in this setting. Through reviewing the industry's literature (e.g., Shi, Li & Ziaee Bigdeli, 2016; Banker, Chang and Majumdar, 1998), exploring relevant periodicals (e.g., Telephony Magazine), and interviewing with industry experts two types of services were identified –i.e., prepaid and postpaid. A specialist position translates to offering only one of the prepaid or postpaid services. Prepaid (also known as no-frills) services require customers to make an upfront payment to use specific and usually restricted services (e.g., limited talk and texts). In postpaid (also known as subscription-based or contract) service, customers pay at the end of the period according to the amount and types of services that they have used. While the two services of prepaid and postpaid, at first glance, may simply point to different revenue models, there are other differences in the way firms manage each service. One aspect of such differences is a need to have partially different technological capabilities, such as billing systems to support each service. Related to this, the prepaid services require real-time management of customers' account to track when their credit is exhausted, on the other hand, the postpaid services have a higher flexibility in the payment system to enable customization based on customers' services and tariffs. In addition, there is heterogeneity in customer segments target by each type of service. Prepaid services usually are suitable for cost-conscious, younger subscribers, whereas prepaid services work better for heavy users and early adopters (Eggers, Grajek and Kretschmer, 2011; Grajek and Kretschmer, 2009). The heterogeneous market segments across the two services require careful marketing efforts to tailor proper promotions and plans for each segment. A full description of differences between the two services is represented in Table 1.

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INSERT TABLE 1 ABOUT HERE

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Generalist position, on the other hand, refers to a situation where firms offer both prepaid and postpaid services. Offering both services enables potential transfers between the two. In this sense, carriers might offer prepaid services to attract new customers, generate the lock-in effect, and ideally shift them to the more profitable postpaid services. Here is a quote from a newspaper article that illustrates managerial motives behind offering both services:

> *"At least two top executives of the three mobile operators have said it is their hope to rope in new users on prepaid and then cultivate them to be bigger spenders and eventually convert them to postpaid."* (The Edge Publishing, 2005)

This quote points how offering one service sets the stage for firms to make profits from the other one. In addition to this view, being a generalist player gives customers the flexibility to simply change and select from multiple offerings. As illustrated in the theoretical part, this feature is particularly valuable for customers who are undecided about the type of services to purchase. Thus, it is expected that firms select the services they offer, and therefore their competitive position, based on resources and capabilities they possess. In this sense, the choice of competitive position is endogenous to the firm. To address the problem of endogeneity, we draw on an exogenous policy change that affects firm performance and not firm positioning –i.e., Mobile Number Portability (MNP). This policy allows customers to keep their numbers while switching service provider. In this sense, this policy reduces customer switching costs to a large extent. This policy, that was first implemented in Singapore in 1997, is currently implemented in many different countries (see Table 2).

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INSERT TABLE 2 ABOUT HERE
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1.4.2. Measures

Dependent Variable. The main variable of interest, firm growth, is measured in total number of

subscribers in two consecutive quarters. In specific, we calculated firm growth in time *t* by

computing the natural logarithm of total subscribers for firm *i* in quarter *t*, or *ln(subscribers$_{it}$)*

Independent variables. The first independent variable, *Generalist*, shows if a firm positions itself

as a generalist within the industry[7]. We coded this variable as a dichotomous measure, receiving a

value of 1 if the firm is a generalist and 0 otherwise (i.e., the firm is a specialist). To

operationalize a firm's position, we used its offerings. We calculated the average share of a firm's

prepaid services before the policy change[8]. Next, we constructed the quartiles in the sample based

on the average share of prepaid services for all firms. Subsequently, we assigned 1 (generalist) to

a firm if it is positioned in the second or third quartiles and assigned 0 to a firm if it is positioned

in the first or last quartiles[9]. This operationalization reveals that there are several generalists in

our sample which offer a mix of both prepaid and postpaid services (e.g., Telefonica Moviles

Argentina), whereas there are specialists that have a preponderance of one service or the other

one (e.g., Claro Brasil). Our further investigation to the websites of the firms in our sample

supported the focus firms. Specialists had a clear emphasis on one of the services, while

generalists promoted each service quite equally. Alternative operationalizations of this

independent variable is explained in the robustness checks section.

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[7] It is worth to mention that in this categorization we assume that firms cannot change their positions in short windows of time. We relaxed this assumption in our follow-up robustness checks.

[8] Note that prepaid and postpaid offering are complementary, in this sense, a firm with 40% prepaid offerings has 60% postpaid offerings. Thus, using the share of one of the offerings (in our case prepaid), incorporates the share for the other one (postpaid) as well.

[9] This categorization of competitive positions was emerged from our interviews with industry experts.

The second independent variable, *PostMNP*, is equal to1 for observations in the quarters after the policy introduction and 0 for the remaining observations.

Control variables. We use a number of control variables from GSMA Intelligence and GlobalComms databases to proxy for the firm- and country-level characteristics. *Market share* is included in our models to capture firm size and calculated as the total number of firm subscribers to the total number of subscribers in a country. Larger firms (firms with a higher market share) might be better able in keeping the growth rate steady once the policy is introduced (Shi, Chiang, and Rhee, 2006). We also control for the percentage of a firm's subscribers that have discontinued their services in a given quarter, i.e., *churn rate*. This measure helps us to control for firms that undertake aggressive strategies to grow. To acquire new customers, some firms may offer heavy discounts for new subscribers at the expense of losing existing ones. Thus, controlling for churn rate is important as it together with new addition rate account for firm growth[10]. Furthermore, we control for the stage of adoption of cellular services across countries in our study using *population penetration*. This variable is calculated based on the total number of subscribers in a given country divided by population. Finally, we use firm, quarter, and year-fixed effects in our regressions.

1.4.3. Descriptive statistics

Table 3 presents the summary statistics and correlations for all variables used in this study. Some variables have medium to high correlation, but preliminary analyses revealed that the estimates were stable. In addition to the correlations reported in the table, two correlations coefficients of interest are those of the Generalist with prepaid percentage, which is equal to 0.48. This

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[10] The growth rate, in this sense, is percentage of new customers minus churn rate.

correlation coefficient suggests that the two constructs of are empirically distinct. Also, given the context of our study on the emerging economies, we faced several limitations in the availability of data for several variables. For example, churn rate was missing for a significant number of our observations. Such data limitations, however, do not bias our study, considering that our analyses did not indicate any patterns in missing observations.

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INSERT TABLE 3 ABOUT HERE
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1.4.4. Research design

We use a differences-in-differences methodology with a fixed-effects model configuration to compare the relative advantage of the generalist position before and after the introduction of number portability. This methodology has frequently been applied for drawing causal inferences (e.g., Abadie, Diamond, and Hainmueller, 2010; Card and Sullivan, 1987; Marx, Strumsky and Fleming, 2009; Younge, Tong and Fleming, 2014; Bennett, Seamans and Zhu, 2014). To test the effects of the generalist position on firm growth, we use the following regression model with firm- and time-fixed effects:

$$ln(subscribers_{it}) = \beta_0' + \beta_1 PostMNP_{it} + \beta_2 Generalist_i \qquad (1)$$
$$+\beta_3 PostMNP_{it} \times Generalist_i + \bar{\theta} Controls + \varepsilon_{it}$$

In this model, i indexes the firm and t indexes time. The dependent variable, ln(subscribers$_{it}$), is a continuous variable that illustrates the number of subscribers in a given quarter. The variable PostMNP$_{it}$ is a dummy variable for the time interval that mobile number portability is enforced which is equal to 1 if a given firm i is subject to this policy. The variable Generalist$_i$ is a binary variable which is equal to 1 if the firm i position itself as a generalist in the industry.

The identification on β1 depends on comparing the behavior of the treatment group before and after the introduction of mobile number portability relative to the behavior of a control group of firms. Specifically, the coefficient on β1 captures firms' performance outcome (firm growth) after the regulatory change. The coefficient on β2 captures the average effect of the generalist positioning on customer acquisition. Finally, the main coefficient of interest, β3, measures the change in performance of treatment group after the implementation of the policy relative to control group. The Differences-in-Differences method removes observed or unobserved differences between treatment and control groups, given that such differences remain fixed over time. The fixed-effects model configuration enables us to examine the increase in the number of subscribers for firm *i*.

1.5. RESULTS

To begin with the results, we compare our variables before and after the introduction of mobile number portability. Table 4 presents the statistics for our main variables for (1) before the policy enforcement, (2) after the policy enforcement, and (3) difference between the two periods. The results reveal that after the introduction of mobile number portability the logarithm of firm subscribers increased by 1.14 unit. This outcome means that firms, on average, gained 10,017,727 subscribers after the policy change. Also, the policy change increases the customer churn rate by almost 1% that is a notable increase considering average churn rates in the industry.

Next, we turn to the hypothesis testing results. Table 5 illustrates estimates of the differences-in-differences model. In all the models, variables are lagged by one quarter. In the baseline regression (Model 1), the control variables of market share, churn rate, and penetration rate are included. The coefficients of market share and penetration rate are positive and

significant. These results mean that firms with a higher market share and those that are located in countries with a higher penetration rate grow more. The coefficient of churn rate is positive but not significant. The next model, Model 2, introduces the PostMNP variable to the regression. The results reveal a positive and significant relationship between PostMNP and firm growth. In other words, after number portability firms on average acquire more subscribers in comparison to before the policy implementation. Model 3 incorporates the interaction effect between PostMNP and Generalist. The coefficient of the interaction term, the main coefficient of interest, is negative and significant. As expected, generalists experience a substantial negative effect on firm growth after the policy change. The size of the effect is meaningful –a one-standard-deviation increase in positioning as a generalist translates into on average acquiring 125,358 subscribers fewer in comparison to positioning as a specialist. To be more specific, after the policy change, the average generalist gains 14,067 subscribers in total, whereas the average specialist acquires 139,425 subscribers in total. This finding confirms our argument that generalists lose their key advantage –ex-ante flexibility once customer switching costs are reduced.

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INSERT TABLE 4 ABOUT HERE
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1.5.1. Robustness checks

In addition to the results presented in Table 5, we conducted a series of analyses to check the robustness of our results. First, we explored the effect of each revenue model (prepaid and postpaid) on our findings. Next, to examine whether our operationalization of main independent variable drives the results, we constructed other measures to proxy for Generalist. Lastly, we used the share of the prepaid services in the regression models to provide additional evidence for our findings.

Effects of prepaid and postpaid services. One potential limitation of our analysis could be that the policy change (MNP) has a varying effect on the two revenue models of prepaid and postpaid for some unobserved reasons. Indeed, it is expected that after the policy change one revenue model could better help firms to acquire and retain customers in comparison to the other one. For example, firms through postpaid services can offer longer contracts and free handsets which in turn could create strong lock-in effects. To take into account this concern, we reconstructed our independent variable, *Generalist_equal_share*, in a way that the average share of prepaid services and postpaid services in the generalist group is equal to the average share of prepaid services and postpaid services in the specialist group. In this sense, the two groups differ only in terms of the between-firms distribution of prepaid and postpaid services. In the specialist group, most of the prepaid services offered belong to few companies that are specialized in prepaid, while most of the postpaid services offered belong to the remaining ones that are companies specialized in postpaid. On the other hand, in the generalist group, we have a more homogeneous distribution of prepaid and postpaid services across firms. Figure 1 provides a schematic illustration of classifying generalist and specialist groups with an equal proportion of prepaid to postpaid shares.

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INSERT FIGURE 2 ABOUT HERE
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Next, we reran the regression models using the new independent variable Generalist_*equal_share*. The results in Table 6 remained the same as those of our previous analyses. These results rule out any alternative explanation that our findings are driven by unique characteristics of prepaid or postpaid revenue models in term of customer acquisition or customer retention. If generalists do not have any specific advantage, like the one resulted from the ex-ante

flexibility given to customers, we should not be able to find any differences between the performances of the two groups after the policy change.

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INSERT TABLES 5 ABOUT HERE
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Alternative categorization of Generalist. The key assumption of our initial classification of competitive positioning was that firms could not change position within the timeline of our study. In a different operationalization, we adopted a time-variant classification and let firms to change their positions over time. Doing so, we first split the sample into quartiles based on the distribution of the share of the prepaid services. The obtained quartiles are slightly different from those in our initial classification, as they are constructed based on the share of the prepaid services in the whole sample (and not before the policy change). Next, we created a binary variable equal to 1 (Generalist) whenever a firm falls within the second or third quartiles of prepaid services in the whole sample, and equal to 0 (Specialist) otherwise. The summary statistic of the variable obtained from this categorization, *Generalist_relative*, can be found in Table 4. The results in Table 7 confirm our initial findings that generalists experience a larger drop in firm growth after the policy change in comparison to specialists. Similarly, another categorization of generalist, *Generalist_thresholds*, is made based on specific thresholds the share of prepaid services –e.g., generalist positions are those with prepaid services between 5 and 95, or 10 and 90 percentages. The results in Table 8, again, lend support to our hypothesis. Taken together, these additional analyses confirm that our results are robust to different operationalizations of our key independent variable –i.e., generalist position.

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INSERT TABLES 6 AND 7 ABOUT HERE
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Using prepaid shares. Considering that our operationalization of competitive positioning relies on firm offerings –i.e., the share of firm's prepaid offerings, we implemented an additional analysis to explore the pattern of firm growth with a focus on the share of prepaid percentages. Models in Table 9 represent firm growth before and after the policy change. In particular, Model 5 introduces the squared-term of prepaid percentages and Model 6 includes the interaction effect between squared-term of prepaid percentages and PostMNP. The negative coefficient between the prepaid percentage and PostMNP in conjunction with the positive coefficient between the squared-term of prepaid percentage and PostMNP point to the presence of a curvilinear relationship between the share of prepaid offerings and firm growth. This finding confirms that firms located in the middle of the prepaid distribution (i.e., those that are generalist) experience a larger drop in their growth rate after the policy change in comparison to other firms. This pattern, again, confirms our initial argument that generalist –that we define them as firms with balanced shares of prepaid services and postpaid services– experience a significant drop in their growth rate after the policy change. Figure 3 represents the finding of this additional analysis. The inflection point of the u-shaped relationship between firm growth and share of the prepaid services is 59%.

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INSERT FIGURE 3 ABOUT HERE
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INSERT TABLE 8 AND TABLE 9 ABOUT HERE
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1.6. DISCUSSION AND CONCLUSIONS

While competitive positioning has been the center of scholarly attention back in 1980's, it has appeared again in the recent studies (for example, see the recent issue of Strategy Science Journal on competitive positioning). Comeback of competitive positioning in the strategic management is not surprising considering that it is a decision that managers frequently make. In this paper, we extended the traditional firm-centric theory on competitive positioning to incorporate contingencies that affect the demand-side, an important but frequently overlooked dimension of positioning, which naturally entails a relationship between firms and their customers.

A demand-based approach highlights that specialist and generalist positions will vary in their advantages depending on market frictions such as customer switching costs. We predict that firms with generalist positions will see customer acquisition fall after a reduction in customer switching costs. Our analysis of 26 Latin American mobile communications firms over a 12-year period supports this theoretical prediction. Returns to competitive positioning not only depend on the costs and advantages that firms experience but also on the advantages each position provides for customers. Thanks to our identification strategy, we are able to estimate the causal effect of a competitive positioning on firm growth and overcome the limitations of previous studies. The presence of organizational frictions is necessary to explain why companies do not change position immediately after the policy change. The presence of such organizational frictions, as an implicit assumption behind our model, is based on the prior literature suggesting that changing position is extremely costly and sometimes needs acquiring resources and capabilities that are not immediately available for companies.

We identified different explanations for the casual effect captured in this study. One valid concern is whether the rise of one service, say prepaid, drives the observed pattern of firm

growth. With our further analysis represented in robustness section, we show that nature of services in term of the attractiveness in attracting new customers is not a driver of our results. One other interesting pattern is the emergence of mobile virtual network operators (MVNOs) that can shape the way mobile operators position themselves. For example, it is possible that companies make partnerships with such virtual networks to offer prepaid services under different brands. In this way, they become more specialized in one service (postpaid) and outsource the other one (prepaid). In order to check this proposition and whether there is a difference among companies with different competitive positions, we checked if generalists are more likely to make a partnership with MVNOs after the policy change in comparison to specialists. The results of Cox model analysis reveal that generalist and specialist are equally likely to create a partnership with MVNOs when number portability is in place.

An alternative explanation for the lower growth rate for generalists in comparison to specialists could be because of differences in pricing strategies. In this sense, generalists could have increased their prices more than specialists after the policy change and as a result, the former group grows less in comparison to the latter group. Such changes in prices are somehow reflected in firms ARPU or average revenue per user. Our analysis rules out this alternative explanation and shows that generalists do not have a higher ARPU than specialist after the policy change. Also, there are some other attributes of firms in the telecommunications industry that one could take into account. For instance, some companies are industry incumbents meaning that they have own fixed-lines and are somehow diversified. Therefore, one could expect that the negative effects of the policy change might be lower for incumbent generalists. While incumbency is an interesting aspect of firm's profile, it is not a relevant point in our study. Indeed, the differences-

in-differences configuration applied in this study accounts for the all firm characteristics that do not change over time.

Our theory contributes to the literature on strategic positioning and the growing area of demand-based approaches to strategy. The results illustrate the key role that demand-side factors play in the relative attractiveness of different strategic positions. Our findings suggest that the viability and attractiveness of generalist positions may depend on forms of specificity or lock-in in the relationship between firm and consumer. When these are relaxed, the addition and retention of customers become much more challenging for firms with a generalist position.

It is important to acknowledge the limitations of this study. The operationalization of firm positioning which is specific to our setting could create limitations to generalize the results to other contexts. In addition, our model could be applicable only in contexts in which the value of a good or service is not ex-ante clear. While this study opens a window on the relationship between strategic position and market frictions, it also suggests that substantially more research is necessary to understand the sustainability of competitive advantage in different positions. In particular, there may be an array of organizational choices – such as specialist or generalist – that influence the ability of firms to capitalize on advantageous strategic positions in different demand settings.

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Figure 1. Comparing the share of generalist in settings with high vs. low customer switching costs

p_i^*
Generalist's share in high customer switching costs setting

$p_i^{*\prime}$
Generalist's share in low customer switching costs setting
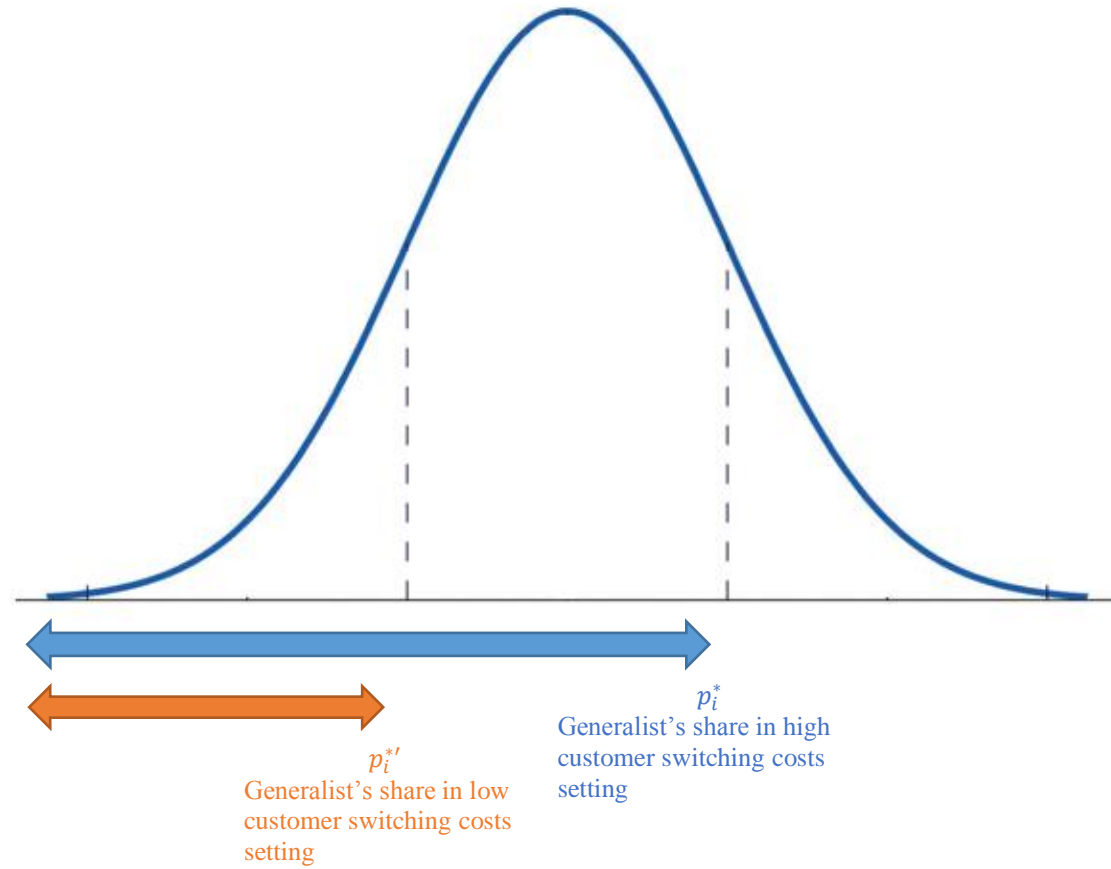
Figure 2. Classification of Generalist and Specialist groups based on equal relative share of prepaid and postpaid services[1]
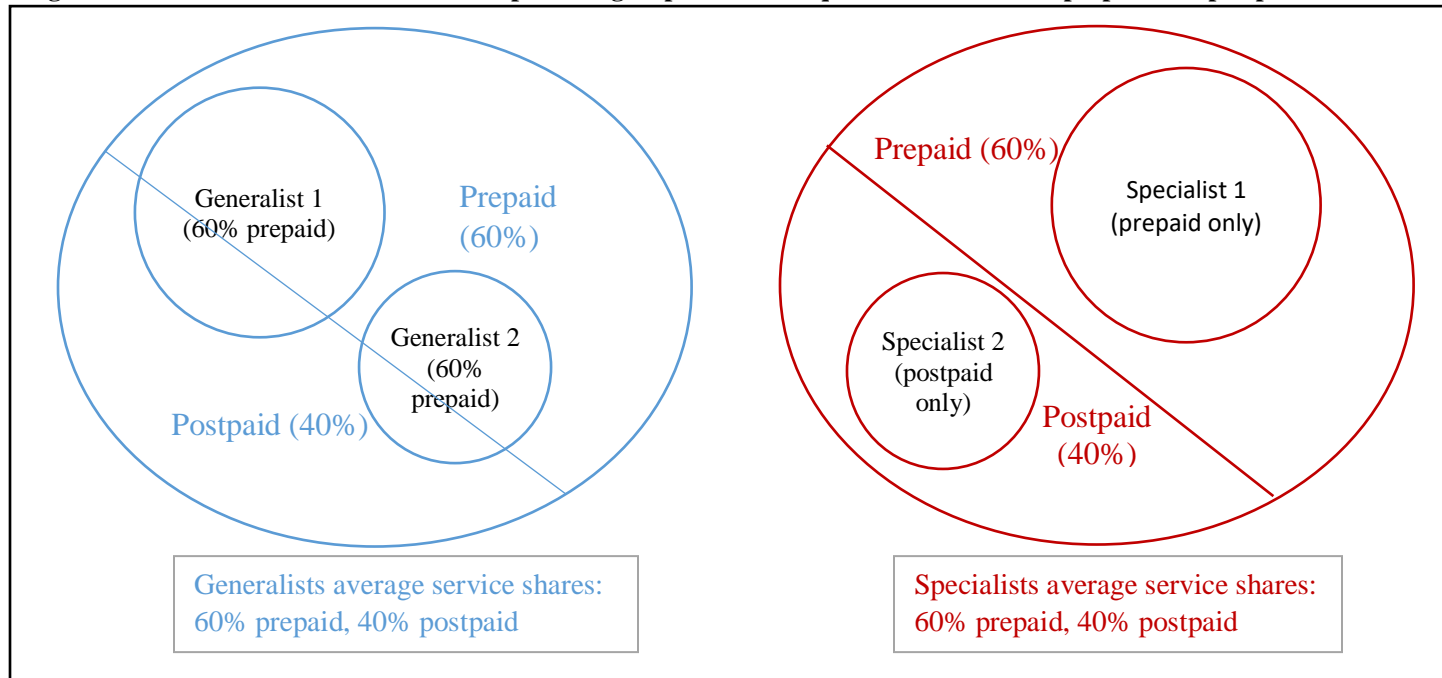
[1] This Figure represents an example of when the share of prepaid and postpaid services are equal among our Generalist and Specialists groups. In this way, we can control for any potential effects of companies business models on firm performance.

Figure 3. The relationship between share of prepaid services and firm growth[1]
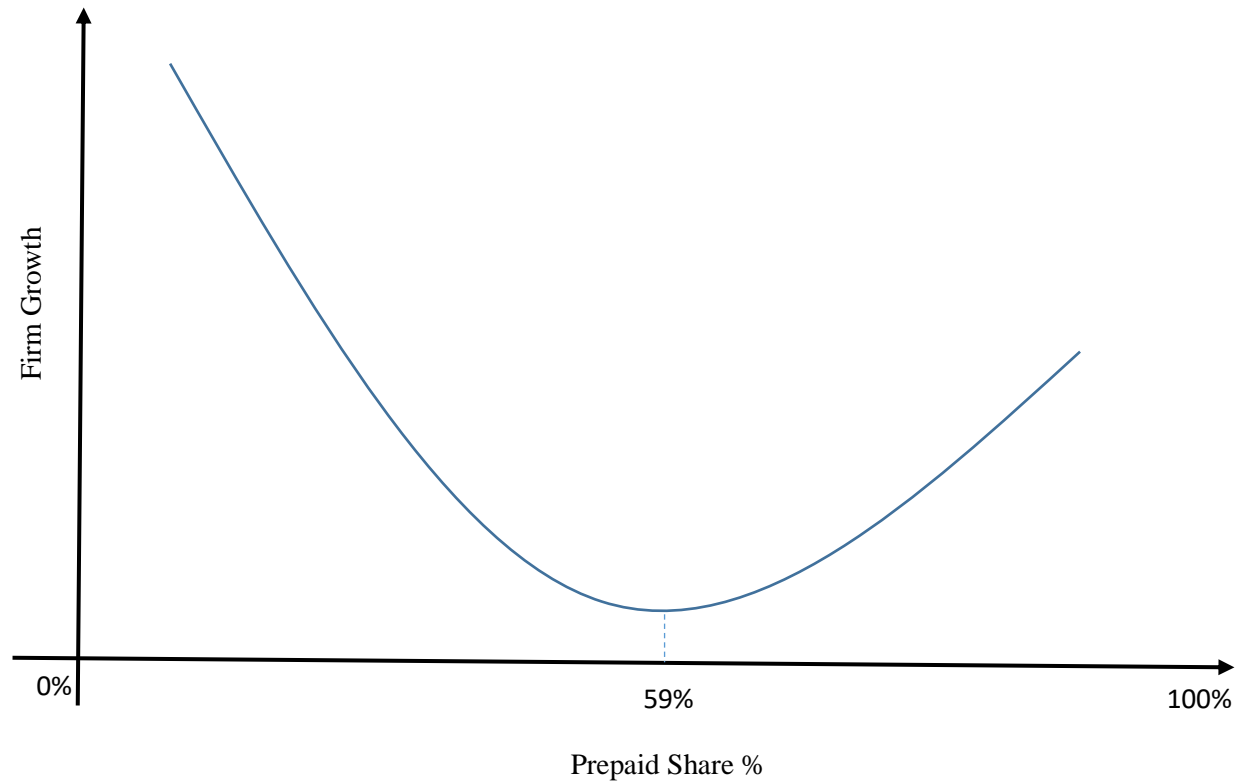
¹ The inflection point is calculated from solving Model 6 in Table 9.

Table 1. Review of difference in prepaid and postpaid revenue models

	Prepaid	Postpaid
Strategic goal	Market growth. Enhancing market share by offering basic services to cost-sensitive customer segments	Profitability. Increasing profit margin by offering value-added services
Revenue models	In advance. A pre-specific and brackets-based revenue stream in which customers are charged before using the service. Carriers hope to benefit from recurring purchases.	At the end: Charging customers at the end of the period according to their consumption of services/plans. There is no limitation in the number of text messages or minutes of the call.
Value propositions	Basic plans. Delivering core service with additional services being offered as add-ons	Sophisticated plans. Advanced features for customers (e.g., bundling, device leasing, unlimited data plans)
Segments	Cost-conscious/ youth. Short (one) time users and subscribers with a limited budget	Families and professionals. Subscribers with financial stability, heavy users, and early adopters
Software (billing systems)	Advanced (real-time monitoring). To stop the plan once subscriber's plan is exhausted	Less sophisticated. Only to keep track of subscribers' consumption
Channels	Diversified. Network of retailers, online through third-parties and carrier itself	Centralized. Carrier-owned stores, website, and App
Average revenue per user	Low. Revenue is mainly generated from the core service	High. A combination of core and value-added services contributes to revenue

Table 2. Introduction of mobile number portability (countries used in this study are marked in bold)

Country	Year
Singapore	1997
Netherlands, Hong Kong, United Kingdom	1999
Spain, Switzerland	2000
Australia, Sweden, Denmark, Norway	2001
Germany, Italy, Belgium, Portugal	2002
United States, Greece, Finland, Ireland, France	2003
Austria, Iceland, Cyprus, Hungary, Lithuania, South Korea	2004
Slovenia, Taiwan, Malta, Luxembourg, Estonia	2005
South Africa, Oman, Saudi Arabia, Poland, Czech Republic, Croatia, Slovakia, Japan	2006
Israel, Pakistan, Canada, Morocco, Latvia, New Zealand	2007
Brazil, Turkey, Bulgaria, Romania, Malaysia, Macedonia, **Mexico**, Egypt, Bulgaria	2008
Ecuador, Congo, **Dominican Republic**	2009
Thailand, Jordan, **Peru**, Albania	2010
Vietnam, **Panama**, **Colombia**, Ghana, Bahrain, Serbia, Kenya, Georgia, India, United Arab Emirates	2011
Moldova, Sudan, Belarus, **Chile**	2012
Russia, Kuwait, Nigeria	2013
Honduras, Armenia, Azerbaijan	2014
El Salvador, Kazakhstan, Senegal	2015

Table 3. Descriptive statistics and correlations (N=814)

	Mean	S.D.	Min	Max	1	2	3	4	5	6	7	8	9
1. Ln(subscribers$_{it}$)	15.92	1.42	11.87	18.23	1								
2. Generalist (dichotomous)	0.53	0.50	0.00	1.00	0.35	1							
3. Generalist_relative (dichotomous)	0.61	0.49	0.00	1.00	0.44	0.67	1						
4. Generalist_threshold (dichotomous)	0.80	0.40	0.00	1.00	0.66	0.53	0.63	1					
5. Market share (%)	29.80	21.74	0.70	78.70	0.55	0.25	0.36	0.63	1				
6. Population penetration (%)	91.23	35.71	10.10	163.60	0.31	0.02	-0.02	0.14	-0.02	1			
7. Churn rate (%)	2.87	1.10	0.90	9.20	0.33	0.21	0.25	0.24	0.19	0.27	1		
8. Prepaid (%)	65.82	33.25	0.00	97.40	0.63	0.48	0.64	0.93	0.63	0.05	0.34	1	
9. MNP	0.48	0.50	0	1	0.4	0.09	0.23	0.09	0.07	0.39	0.42	0.12	1

Table 4. Descriptive statistics before and after the policy change (2003-2015)

Variables	Pre: MNP=0			Post: MNP=1			
	Obs.	Mean	St. Dev.	Obs.	Mean	St. Dev.	*Diff.*
Ln(subscribers$_{it}$)	422	15.38	1.40	392	16.51	1.19	1.14
Generalist	422	0.48	0.50	392	0.57	0.50	0.09
Generalist_equal_share	422	0.21	0.41	392	0.18	0.38	-0.03
Generalist_relative	422	0.50	0.50	392	0.72	0.45	0.22
Generalist_threshold	422	0.76	0.43	392	0.83	0.37	0.07
Market share (%)	422	28.34	21.82	392	31.37	21.57	3.04
Population penetration (%)	422	77.83	41.17	392	105.6	20.58	27.82
Churn rate (%)	422	2.43	0.85	392	3.35	1.15	0.92
Prepaid (%)	422	61.98	35.82	392	69.96	29.74	7.98
Observations (count)		422			392		
Number of firms		26			26		

Table 5. Fixed-effects models showing the effects of Generalist on firm growth

DV. Ln(subscribers$_{it}$)	Model (1)	Model (2)	Model (3)
MNP$_{(t-1)}$		0.100**	0.240**
		(0.0422)	(0.0947)
Generalist$_{(t-1)}$ × PostMNP$_{(t-1)}$			-0.213**
			(0.0974)
Market share $_{(t-1)}$	0.0307**	0.0301**	0.0324**
	(0.00520)	(0.00514)	(0.00539)
Population penetration $_{(t-1)}$	0.00919**	0.00969**	0.0107**
	(0.00174)	(0.00168)	(0.00149)
Churn rate $_{(t-1)}$	0.0195	0.0186	0.0195
	(0.0280)	(0.0269)	(0.0220)
Constant	13.20**	13.22**	13.15**
	(0.180)	(0.178)	(0.164)
Observations	814	814	814
R-squared	0.951	0.953	0.960
Number of firms	26	26	26
Firm FE	YES	YES	YES
Year & Quarter FE	YES	YES	YES

Robust standard errors (clustered at the firm-level) in parentheses

** $p<0.05$, * $p<0.1$

Table 6. Fixed-effects models showing the effects of Generalist_equal_share on firm growth

	Model (1)	Model (2)	Model (3)
DV. Ln(subscribers$_{it}$)			
MNP$_{(t-1)}$		0.100**	0.148**
		(0.0422)	(0.0520)
Generalist_equal_share$_{(t-1)}$ × PostMNP$_{(t-1)}$			-0.162**
			(0.0574)
Market share $_{(t-1)}$	0.0307**	0.0301**	0.0300**
	(0.00520)	(0.00514)	(0.00512)
Population penetration $_{(t-1)}$	0.00919**	0.00969**	0.0101**
	(0.00174)	(0.00168)	(0.00171)
Churn rate $_{(t-1)}$	0.0195	0.0186	0.0192
	(0.0280)	(0.0269)	(0.0259)
Constant	13.20**	13.22**	13.23**
	(0.180)	(0.178)	(0.173)
Observations	814	814	814
R-squared	0.951	0.953	0.955
Number of firms	26	26	26
Firm FE	YES	YES	YES
Year & Quarter FE	YES	YES	YES

Robust standard errors (clustered at the firm-level) in parentheses
** $p<0.05$, * $p<0.1$

Table 7. Fixed-effects models showing the effects of Generalist_relative on firm growth

DV. Ln(subscribers$_{it}$)	Model (1)	Model (2)	Model (3)	Model (4)
Generalist$_{(t-1)}$		0.0217	0.0280	0.136**
		(0.0359)	(0.0319)	(0.0505)
MNP$_{(t-1)}$			0.103**	0.265**
			(0.0428)	(0.103)
Generalist_relative $_{(t-1)}$ × PostMNP$_{(t-1)}$				-0.221**
				(0.0891)
Market share $_{(t-1)}$	0.0307**	0.0317**	0.0312**	0.0321**
	(0.00520)	(0.00535)	(0.00526)	(0.00523)
Population penetration $_{(t-1)}$	0.00919**	0.00929**	0.00983**	0.0105**
	(0.00174)	(0.00173)	(0.00166)	(0.00138)
Churn rate $_{(t-1)}$	0.0195	0.0208	0.0202	0.0211
	(0.0280)	(0.0294)	(0.0283)	(0.0226)
Constant	13.20**	13.17**	13.18**	13.13**
	(0.180)	(0.197)	(0.194)	(0.174)
Observations	814	814	814	814
R-squared	0.951	0.951	0.953	0.960
Number of firms	26	26	26	26
Firm FE	YES	YES	YES	YES
Year & Quarter FE	YES	YES	YES	YES

Robust standard errors (clustered at the firm-level) in parentheses
** $p<0.05$, * $p<0.1$

Table 8. Fixed-effects models showing the effects of Generalist_thresholds on firm growth

DV. Ln(subscribers$_{it}$)	Model (1)	Model (2)	Model (3)	Model (4)
Generalist$_{(t-1)}$		0.0703	0.0707	0.217**
		(0.0727)	(0.0696)	(0.0748)
MNP$_{(t-1)}$			0.101**	0.432**
			(0.0423)	(0.106)
Generalist_thresholds$_{(t-1)}$ × PostMNP$_{(t-1)}$				-0.377**
				(0.105)
Market share $_{(t-1)}$	0.0307**	0.0318**	0.0312**	0.0310**
	(0.00520)	(0.00551)	(0.00543)	(0.00452)
Population penetration $_{(t-1)}$	0.00919**	0.00899**	0.00948**	0.00998**
	(0.00174)	(0.00184)	(0.00177)	(0.00147)
Churn rate $_{(t-1)}$	0.0195	0.0215	0.0206	0.0122
	(0.0280)	(0.0303)	(0.0292)	(0.0169)
Constant	13.20**	13.12**	13.14**	13.09**
	(0.180)	(0.219)	(0.217)	(0.177)
Observations	814	814	814	814
R-squared	0.951	0.951	0.953	0.967
Number of firms	26	26	26	26
Firm FE	YES	YES	YES	YES
Year & Quarter FE	YES	YES	YES	YES

Robust standard errors (clustered at the firm-level) in parentheses

** $p<0.05$, * $p<0.1$

Table 9. Fixed-effects models showing the effects of firm offerings (using prepaid offerings) on firm growth

DV. Ln(subscribers$_{it}$)	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Prepaid% $_{(t-1)}$		0.00513**	0.00508**	0.00572**	-0.000760	0.00256
		(0.000798)	(0.000769)	(0.000752)	(0.00473)	(0.00392)
MNP$_{(t-1)}$			0.0961**	0.316**	0.312**	0.352**
			(0.0409)	(0.110)	(0.110)	(0.102)
Prepaid% $_{(t-1)}$ × PostMNP$_{(t-1)}$				-0.00308**	-0.00303**	-0.0116**
				(0.00139)	(0.00138)	(0.00372)
Prepaid-Squared $_{(t-1)}$					6.73e-05	2.22e-05
					(5.58e-05)	(4.68e-05)
Prepaid-Squared $_{(t-1)}$ × PostMNP$_{(t-1)}$						9.90e-05**
						(3.69e-05)
Market share $_{(t-1)}$	0.0307**	0.0329**	0.0323**	0.0321**	0.0312**	0.0318**
	(0.00520)	(0.00500)	(0.00481)	(0.00452)	(0.00404)	(0.00410)
Population penetration $_{(t-1)}$	0.00919**	0.00792**	0.00840**	0.00861**	0.00837**	0.00911**
	(0.00174)	(0.00172)	(0.00166)	(0.00145)	(0.00154)	(0.00133)
Churn rate $_{(t-1)}$	0.0195	0.00628	0.00556	0.00824	0.00492	0.00773
	(0.0280)	(0.0190)	(0.0182)	(0.0174)	(0.0147)	(0.0142)
Constant	13.20**	12.92**	12.94**	12.92**	13.02**	13.00**
	(0.180)	(0.136)	(0.132)	(0.135)	(0.119)	(0.118)
Observations	814	814	814	814	814	814
R-squared	0.951	0.960	0.962	0.968	0.969	0.970
Number of firms	26	26	26	26	26	26
Firm FE	YES	YES	YES	YES	YES	YES
Year & Quarter FE	YES	YES	YES	YES	YES	YES

Robust standard errors (clustered at the firm-level) in parentheses

** $p<0.05$, * $p<0.1$

Essay 2

Competition and Timing: New technology adoption by subsidiaries of global firms

ABSTRACT

Our paper explores how and when subsidiaries of global telecommunications companies adopt a new generation of technology. We consider the role of competition that the focal subsidiary faces within the organization and from the local environment influences the timing of the subsidiary's adoption to 4G technology. We hypothesize that the extent to which 4G technology has already been adopted within the firm has contrasting effects, accelerating adoption by the focal subsidiary because of mimetic adoption and delaying its adoption because of competition for firm resources. The extent to which the technology has already been adopted by rivals in the host country is proposed to accelerate the adoption of the technology by the focal subsidiary, as the subsidiary counters rival efforts in order to maintain its competitive position. We further explore the moderating effects of subsidiary performance. Our results demonstrate support for the negative effects of competition within the firm, which delays adoption and positive effects of competition from the host country, which accelerates adoption by the subsidiary. Stronger performing subsidiaries are more likely to resist intra-organizational trends of adoption, enhancing the negative influence of intra-firm adoption.

2.1. INTRODUCTION

Managing technological changes and ferment is a critical aspect of the strategic actions and decisions taken by a firm. Technological innovation and strength confer competitive advantage and success (Porter, 1985; Caves, 1996; Dunning 1993), and firm abilities in confronting technological changes are a primary determinant of survival (Christensen, Suarez and Utterback, 1998; Cooper and Schendel, 1976). Despite the acknowledged importance of managing technological change, research demonstrates the many challenges that organizations face in responding to technological changes often resulting in failure (Ahuja, Lampert and Tandon, 2008; Hill and Rothaermel, 2003; Leonard-Barton, 1992). Recognizing this, a burgeoning stream of research has explored why some firms are more successful at adopting new technologies. Studies in this realm have considered a variety of drivers, of whether and when firms adopt new technologies, including the nature of assets held by the firm, competitive rivalry, cognitive capabilities and characteristics of firm leadership (Gerstner, Konig, Anders and Hambrick, 2013; Tripsas, 1997; Mitchell; 1989).

Subsidiaries of global firms can play an important role in the advancement of their parent organizations through the adoption of new technologies, yet at the same time, these subsidiaries differ in their propensity to adopt technological innovations (Barden, 2012). Consequently, understanding the reasons whether and when some subsidiaries are better equipped to adopt new technologies, compared to other subsidiaries *within the same firm* is central to supporting firm competitive advantage. Our research question is –how and when do subsidiaries of global telecommunications companies choose to adopt a new generation of technology? To address this question, we draw on a fundamental idea in the exploration of technological innovation that considers the effect of the characteristics of the organization and environment in shaping

technological change (Tushman and Anderson, 1990). In particular, two interrelated and critical themes in the exploration of adoption of new technologies relate to competitive effects and the timing of adoption (Barden, 2012; Taylor, 2011; Mitchell, 1989). We consider how competition that the focal subsidiary faces within the organization and from the local environment influences the timing of adoption of new technology. Competition within the organization, reflected by the extent to which the new technology has already been adopted by other national subsidiaries, is posited to have a positive influence as organizational boundaries enhance mimetic adoption and reduce risks and uncertainty for the later adopters of new technologies, creating greater incentives for the focal subsidiary to adopt the new technology. At the same time, competition within the organization, particularly for the adoption of new technology, creates significant resource needs and demands. Greater adoption of the new technology by other subsidiaries in the firm may imply fewer resources available to the focal subsidiary to pursue new technology, resulting in an alternate hypothesis of a negative influence on the focal subsidiary's adoption of new technology. Competition from the local environment, reflected by the adoption of the new technology by other firms in the host country, is hypothesized to have a positive effect on the adoption of new technology by the focal subsidiary, as the subsidiary attempts to address the threat posed by these firms to its competitive position.

We further explore moderating effects of the focal subsidiary's performance in the local market and propose that the positive effects of adoption of new technology by other subsidiaries are reduced and the negative effects are magnified, for higher performers. This is because higher performers are more likely to be resistant to the new technology and despite the adoption by other national subsidiaries in the organization, not as easily persuaded by benefits they may gain

in the national context. Similarly, we expect high performers to negatively moderate the positive effects of adoption by other entities in the local environment.

We test our hypotheses in a sample of 358 national subsidiaries of 47 global telecommunications firms, and observe their actions in adopting 4G technology over a period from 2008 to 2015. We find support for the negative effects of competitive pressures within the firm, a greater proportion of other subsidiaries in the organization that have adopted 4G technologies, results in a delayed adoption by the focal subsidiary, supporting resource arguments. On the other hand, a higher proportion of competitors in the local market that have adopted 4G accelerates the likelihood of adoption by the focal subsidiary. The moderating effects suggest that subsidiaries that are strong performers are resistant to intra-firm adoption.

2.2. THEORY AND HYPOTHESES

2.2.1. New technology adoption

Technological change and ferment is a pervasive phenomenon in most fast-paced industries and the actions of the firm in managing this change are important and complex as they create contradictory pressures (Mitchell, 1989). On the one hand, adoption of new technologies, can result in novel ways to create and capture value in several ways (Gertstner et al, 2013). It provides interesting opportunities for growth outside of the firm's traditional focus and cognitive logic (Foster, 1986; Tripsas and Gavetti, 2000). The integration of new technologies with existing technologies can enable breakthroughs in product innovation and support new generations of products (Fleming, 2002). It can improve performance at the product level, supporting firm success and enabling the survival of the firm (Iansiti, 2000; Henderson and Clark, 1990; Chakravarthy and Doz, 1992).

On the other hand, the adoption of new technologies is associated with a number of risks and challenges. New technologies are inherently uncertain and risky and have yet to be proven in their ability to create value. Indeed, the technological risk of using a new technology in an established market, poses a more significant challenge than entering new markets with proven technology (Christensen, Suarez and Utterback, 1998). Firms adopting new technologies face technical and demand uncertainty and the risks of investing in technologies that may provide limited value if the supported products or services are not viable or if consumers are unwilling to buy them (Nelson and Winter, 1982; Williamson, 1985). The risk of new technologies extends beyond the products that incorporate new technologies. It can reduce the sales of existing products due to cannibalization of offerings (Reinganum, 1983; Coase, 1972; Bulow, 1982; Ghose, Telang and Krishnan, 2005). It may also erode the value of existing knowledge, skills and capabilities of the firm and disrupt organizational routines and structure (Abernathy and Clark, 1985; Tushman and Anderson, 1990). Thus, adoption of new technologies may face limited incentives for internal adoption and potentially significant resistance from internal constituents in powerful departments who would lose status and authority and may face disruption, if the firm has strong skills and capabilities in existing technology (Gerstner et al, 2013; Rothaermel and Boeker, 2008; Anand, Oriani and Vassolo, 2010; Hannan and Freeman, 1977).

The firm's assessment of risks and opportunities should consequently determine the likelihood and timing of their adoption of new technologies. There appear to be simultaneous incentives to adopt early, in order to avoid the risk losing the value offered by the opportunity, as well as to delay the adoption of new technology so that the opportunities become more certain and some of the risks are mitigated (Mitchell, 1989). Empirical evidence on the outcomes of early and late adoption offer mixed results. Some studies document an edge for early entrants in

survival (Foster, 1986; Rosenbloom and Cusumano, 1987; Suarez and Utterback, 1995). Others demonstrate that very early entrants fail while later entrants are better poised for survival (Mitchell and Singh, 1993). Reconciling these findings, Christensen, Suarez and Utterback (1998), suggest that there is an optimal window of opportunity for adopting new technology that is neither too early nor too late.

A big part of the decision on timing of new technology adoption is driven by competitive pressures and rivalry. The Austrian School of economics (Schumpeter, 1942), points to the role of competition and rivalry in the innovation arena, that result in a "gale of creative destruction" replacing old technological regimes with the new ones. Once a new technology becomes available, firms are under pressure to make the necessary upgrades. Therefore, the industry suddenly turns into a battlefield in which firms respond to competitive actions. Opportunities and risks associated with new technologies become clearer as a consequence of adoption by competitors. The presence of other firms who adopt the technology can lead to a race to develop and sell a product that is based on the underlying technology (Gilbert and Newbery, 1982; Mitchell, 1989). This is demonstrated in the adoption of electronic payment systems in the U.S. Banking industry in which technology adoption by large banks substantially affected the adoption behavior among local banks (Gowrisankaran and Stavins, 2002).

A variety of mechanisms, related to learning from observation which increases value and lowers costs of adoption, increases positive externalities and legitimacy, and enables in loss avoidance, results in mimetic adoption of technology (Barden, 2012). Greater adoption of the new technology by rivals which result in rollout to new customers, allows the focal organization to learn tactics to avoid as well as adopt to enable greater value and reduced costs of adoption.

Thus, firms tend to mimic innovation adoption behaviors of other firms (Abrahamson and Rosenkopf, 1993; Greve, 1996).

2.2.2. Subsidiary role in adoption of new technologies

The knowledge and technologies of the subsidiaries of global firms play an important role in contributing to the firm's competitive advantage (Cantwell, 2009; Frost, Birkinshaw and Ensign, 2002). These subsidiaries can play an important role in rejuvenating organizational knowledge resources by developing new innovations and technologies (Blomkvist, Kappen and Zander, 2010; Almeida and Phene, 2004). Yet, subsidiaries demonstrate significant variance in their development of new technologies and in their capabilities (Cantwell, 1987; Cantwell and Mudambi, 2005; Kuemmerle, 1999). We explore the extent of this variation by considering the likelihood and timing of a focal subsidiary's adoption of new technologies. Since, technological change is primarily driven by characteristics of the organization and environment (Tushman and Anderson, 1990), we consider the competitive pressures faced by the focal subsidiary to identify the source of variation in likelihood and timing. For the subsidiary, competition arises from two key sources - from within the multinational firm as organizational units compete with each other to gain resources and competences that are embedded in intra-organizational networks (Tsai, 2000), and from its immediate external environment, firms in the host country with whom it competes for opportunities to serve markets and customers (Caves, 1974; Rosenzweig and Singh, 1991). Therefore, we consider the consequences of adoption of new technology by other subsidiaries in the firm and by other firms in the host country, for the adoption of the same technology by the focal subsidiary

The implications of adoption of the new technology by other subsidiaries can generate positive consequences for adoption by the focal subsidiary. Applying the mechanisms proposed

by Barden (2012), since the subsidiaries are within the same organizational umbrella, the ability to capitalize on learning by observation and using cues to adopt the technology more effectively and efficiently are enhanced when more subsidiaries adopt the technology. Strategically this creates an incentive to adopt the new technology quickly. Further, adopting the technology is likely to confer greater legitimacy on the subsidiary, as it is perceived as part of a competitive group of subsidiaries within the firm that have progressed to new technology. There may be potential to capture positive externalities[11] through shared costs of dealing with problems of the new technologies with a large number of other subsidiaries of the MNC. Finally, there may be incentives for loss avoidance, to avoid being perceived as a lagging subsidiary that did not adopt cutting-edge technology. Taken together these arguments suggest that greater adoption of the new technology by other subsidiaries in the firm should result in accelerated adoption of the technology by the focal subsidiary

H1a: The greater the proportion of other national subsidiaries within the firm that have already adopted the new technology, the faster the rate of adoption of the same technology by the focal subsidiary.

While the actions of the other subsidiaries increase incentives for adoption of the technology by the focal subsidiary, this incentive needs to be supported by a considerable investment in resources – financial and technological. Since the focal subsidiary competes with other subsidiaries for the same resources (Stein, 1997), the greater the proportion of other national subsidiaries that have already adopted the technology, the higher the existing demands on the firm's resources to support those adoptions. Correspondingly, the focal subsidiary is likely to face greater constraints and less support, in order to follow through on the adoption of new

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[11] We refer to externalities in this case, as externalities from a subsidiary perspective not the firm perspective.

technology. This suggests an alternative competing hypothesis as the resource constraints are likely to delay the adoption of new technology by the focal subsidiary.

H1b: The greater the proportion of other national subsidiaries within the firm that have already adopted the new technology, the slower the rate of adoption of the same technology by the focal subsidiary.

The focal subsidiary also faces competitive pressures as a consequence of adoption of the new technology by other firms in the local host country. The mechanisms proposed in the context of accelerated adoption by the focal subsidiary in response to adoption by other subsidiaries within the firm are relevant and apply in this situation. The focal subsidiary by virtue of its location in the host country is in a good position to take observational cues and learn vicariously through the adoption experience of a greater number of firms in the host country. The opportunities for shared costs and positive externalities generated by the adoption by other firms are also likely. A big incentive is better perceptions of legitimacy and greater avoidance of loss or liability of foreignness, if it adopts the technology. This is particularly important since the focal subsidiary competes with other firms in the host country for customers and market share. Being able to demonstrate that it does not lag behind competitors technologically is likely to enable it to manage rival threats. Consequently, we propose that greater adoption of the new technology by other firms in the host country should result in accelerated adoption of the technology by the focal subsidiary

H2: The greater the proportion of other firms in the host country that have already adopted the new technology, the faster the rate of adoption of the same technology by the focal subsidiary.

2.2.3. Moderating effect of subsidiary performance

The focal subsidiary's response to competitive pressures and rivalry is necessarily influenced by its performance. We, therefore, consider the moderating effect of subsidiary performance on the

relationships between adoption of new technology by other subsidiaries and other firms and adoption of the same technology by the focal subsidiary. Subsidiaries with stronger performance are likely to be entrenched in and focused on their core technologies and existing trajectory. Consequently, they are less likely to be receptive to observational cues and learning experiences or positive externalities that may be available as a consequence of greater adoption by other subsidiaries and firms. In fact, they may actively resist learning about the new technology, despite the large adoptions, because of the negative implications for their business and disruption to the internal power structures. Such a subsidiary may perceive that its legitimacy and loss avoidance can be persevered by committing to the status quo, where it has strength rather than shifting to the new technology despite the growing adoptions.

In contrast, low performing subsidiaries and firms engage in problemistic search (Cyert and March, 1963) with a higher tolerance for risk (Bromiley, 1991). Imitating other subsidiaries and firms is one potential solution for underperformers while high performers avoid new initiatives (Greve, 1998; 2003). In this sense, when the subsidiary's performance is not satisfactory, decision-makers are more likely to undertake the risks associated with a new technology –assuming that it helps with performance/survival. Thus in subsidiaries with weaker performance, the competitive pressures raised from other subsidiaries within the firm and other firms in the host country are reinforced by the need for the performance enhancement, which jointly accelerates the likelihood and timing of adoption of the new technology. On the other hand, the triggering effects of internal and external competitive pressures to adopt new technology are weakened by decision-makers' avoidance of engaging in uncertain strategic actions in high performing firms. We, therefore, expect high performing subsidiaries to reduce

the positive effects proposed in H1A, enhance the negative effects in H1B and reduce the

positive effects proposed in H2.

H3a: Stronger performance of the focal subsidiary moderates the relationship in H1A, such that it reduces the positive effects of adoption of new technology by other national subsidiaries resulting in slower adoption of the same technology by the focal subsidiary.

H3b: Stronger performance of the focal subsidiary moderates the relationship in H1B, such that it increases the negative effects of adoption of new technology by other national subsidiaries resulting in slower adoption of the same technology by the focal subsidiary.

H4: Stronger performance of the focal subsidiary moderates the relationship in H2, such that it reduces the positive effects of adoption of new technology by other firms in the host country resulting in slower adoption of the same technology by the focal subsidiary.

2.4. EMPIRICAL ANALYSIS AND METHODS

2.4.1. Context

Our study explores this idea in the context of the global telecommunications industry, where

rapid changes in a firm's product and service portfolio are commonplace. These changes are in

turn supported by upgrading to and the adoption of new technologies. New generations of

information and communications technologies (hardware and software that support service

innovation) are constantly rolled out by telecommunications operators, with the older generation

technologies replaced by newer ones (Xu, Venkatesh, Tam and Hong, 2010). To test how and

when global subsidiaries of firms adopt to a new technology, our paper draws on the patterns of

adoption of 4G technology by national subsidiaries of 47 multinational mobile

telecommunications carriers over the 2008-2015 period. This setting is particularly appropriate to

test our hypotheses for several reasons. First, adoption of 4

G technology is a strategic response to the challenges of ferocious competition, poor economic

growth and Government regulation, faced by telecommunications firms worldwide (Bender and

Zakaria, 2014). The shift to 4G technology is widespread in different parts of the world,

including the U.S., Europe, and Asia. A significant number of operators have already committed

to 4G since the first commercial networks rolled it out in 2009 (Menard et al, 2012). Second, firms have several incentives to adopt this new technology. 4G technologies enable telecommunications operators to better fulfill customer needs in a number of ways –supporting up to 10 times faster data speeds, which makes data intensive on the go downloads such as music or high definition video streaming a reality; allowing for faster connection times, ensuring an "always-on" service experience; and reducing round-trip latency by 50% making real-time applications such as VOIP, video calls and online gaming possible (Bender and Zakaria, 2014; Menard et al, 2012). Not only does 4G technology better fulfill consumer needs, but it has the added attraction of increasing data consumption – as Orange SA's Chief Executive Stephane Richard noted, "4G is not only a popular technology but also creates more usage" (Wall Street Journal, 2014). Consequently, Gordon, Bentley and Barnett (2014) conclude that 4G penetration (and use by consumers) is expected to grow significantly across all regions, as Figure 1 demonstrates.

At the same time, these incentives are accompanied by daunting challenges. There is considerable uncertainty related to consumer adoption of new technology (Beardsley, Enriquez, and Garcia, 2004; Rai and Patnayakuni, 1996). Further, the firm has to make huge and risky investments to support the next generation, by participating in competitive bidding in spectrum auctions that can saddle it with an uncompetitive network (Menard, Travasoni, Begonha and Gropp, 2012), demonstrating vulnerability to competitor actions as aggressive players try to garner market share through attractive offers. Substantial expenditures have to be incurred by providers in upgrading and rolling out this technology, as illustrated in Figures 2 and 3, which make the risks of 4G adoption daunting (Gordon et al, 2014).

Further, 4G adoption and the introduction of new 4G services results in a high cannibalization effect for the 2G and 3G services offered by the firm. This is not good news especially for mobile telecommunications carriers that have invested billions of dollars in spectrum action to acquire the 3G license (The Economist, 2003).

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Insert Figures 1 and 2 about here
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2.4.2. Sample and Data

To construct our sample, we used GSMA Intelligence and TeleGeography's GlobalComms databases which provide a comprehensive listing of telecommunications operators. We identified all global telecommunications firms (i.e. with a subsidiary in at least one foreign country outside their home) in operation during the period 2008-2015. We then determined all national subsidiaries of these firms resulting in a sample of 358 national subsidiaries of 47 global telecommunications firms operating in 179 countries across different regions. Our sample includes subsidiaries of multinational mobile telecommunications firms with heterogeneity in size, including large firms like Orange (based in France) with mobile operations in 34 countries, or MTN Group (based in South Africa) active in 22 countries, and smaller firms like Telkom Indonesia (based in Indonesia) with operations in 2 countries. The unit of analysis is subsidiary-quarter and in total, there are over 9000 observations. A panel structure is employed to test the hypotheses.

2.4.3. Measures

Dependent variable. The main variable of interest is the timing of a subsidiary's adoption of 4G technology. To measure the timing of adoption, a binary variable is constructed, equal to "1" in the quarter t, that the focal subsidiary adopts the 4G technology, and equal to "0" otherwise. Adoption of 4G technology is a distinct event and once a subsidiary adopts the new technology,

it exits the sample. Some subsidiaries might adopt different generations of 4G technology over time (e.g., 4G LTE, 4G TD-LTE), however, this study is focused on the first event of subsidiary's adoption of 4G technology to capture the timing of the strategic decision. For subsidiaries that did not adopt 4G technology, no such event is recorded. Typically, the decision to adopt 4G technology is usually made after a firm has already adopted 3G technologies (e.g.,3G, 3.5G). Despite a few cases in which firms adopt 4G technology from earlier generations like 2G, leapfrogging is not common in this setting. This pattern of adoption is also confirmed through in-depth interviews with industry experts.

Main covariates. The first covariate that is used to examine the timing of adoption of 4G technology is the proportion of other national subsidiaries within the firm that have already adopted the new technology (*Subsidiaries proportion*). This variable is calculated as the number of other subsidiaries that have adopted 4G technology by the previous quarter, *t-1,* divided by the total number of subsidiaries within the firm. The second covariate is the proportion of other firms in the host country that have already adopted the new technology (*competitors' proportion*). This variable is derived from the total number of competitors in the host country that have adopted 4G technology by quarter *t-1* divided by the total number of competitors operating in the host country. The last covariate, the focal subsidiary's performance (*high market share$_{t-1}$*), represents the subsidiary's competitive position in the host country. This variable is a dichotomous variable and subsidiary is coded as a strong performer, receiving a value of 1 if its market share is above the median market share for firms in the host country in quarter *t-1*.

Control variables. A number of controls are employed to account for the characteristics of the focal subsidiary, firm, and host country. In order to control for unobserved heterogeneity in focal subsidiary's technological capabilities, the *cumulative number of upgrades in evolution* as well

as the *cumulative number of upgrades in platform* by time *t-1* are incorporated in the model. We created a dummy variable to control for subsidiary partnerships with Mobile Virtual Network Operators (MVNOs) up to the time *t-1* –i.e., *focal subsidiary partnerships$_{t-1}$*. This is because such partnerships might create more incentives for the subsidiary to adopt the new technology, since it can share the risks associated with the adoption decision. The size of the firm is controlled by calculating the natural logarithm of its total subscribers in quarter *t-1* –i.e., *Ln(parent's subscribers$_{t-1}$)*. We controlled for *population penetration* at time t-1 to account for the stage of advancement of mobile services in the host country. In addition, we control for the *parent fixed effects* and *region fixed effects* in our models. Finally, we created a dummy variable equal to 1 once 4G technology has been adopted for the first time in a region (*First 4G in region dummy$_{t-1}$*). This dummy variable allows us to control for the effect that timing of initial introduction/ adoption of 4G technology per se has on the focal subsidiary's decision to adopt the new technology.

2.4.4. Statistical Method

For estimating the effects of independent variables on the length of time taken for adopting 4G technology, we used parametric hazard regression models. These models are useful when the probability of an event occurrence is increasing over time (Box-Steffensmeier and Jones, 2004), which appears to be a trend for the adoption of 4G technology. A positive coefficient in these models indicates that increases in the covariate accelerate the adoption of 4G technology for the focal subsidiary, while a negative coefficient has the opposite effect.

Regressions are run using a hazard function with Weibull distribution. This specification is widely used with parametric hazard models because of its flexibility (Klein and Moeschberger, 2003). To check the robustness of our results, we tested our models with a number of other

hazard function distributions, such as exponential and log-logistic distributions. Eventually, we used Weibull distribution since the goodness of fit obtained from this model was higher in comparison to the other models.

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2.5. RESULTS

Table 1 presents the descriptive statistics of the data used in the analysis. We estimated the variance inflation factors for all the variables in our sample. All variance inflation factors are below 2.5, a threshold recommended for identifying multicollinearity problems (Allison, 2012). The results from parametric hazard regression models are presented in Table 2. The baseline model (Model 1) includes only control variables, whereas the next four models incorporate the covariates. In all the models, variables are lagged by one quarter. Model 2 includes the proportion of other subsidiaries within a firm that have adopted 4G technology. The results lend support to the resource constraints argument (H1b), and reject the imitation argument (H1a). This finding suggests that a focal subsidiary in a global telecommunications firm with a larger proportion of other subsidiaries that have already adopted 4G technology, is slower to adopt the same technology, because it may receive less support, and fewer resources from the firm. Model 3 includes the proportion of other firms in the host country that have already adopted 4G technology. The results show that a greater proportion of other firms in the host country that have adopted 4G technology accelerates the timing of adoption of the same technology for the focal subsidiary supporting our H2.

Models 4 and 5 introduce the interaction effect between the focal subsidiary's performance, and the within firm and within country competitive adoption, respectively. The results in model 4 confirm that strong performance of subsidiary in the host country exacerbates

the negative relationship between subsidiaries proportion and adoption (H3b). The interaction between competitors' proportion and high market share (H4) is negative, but not significant. Finally, Model 6 incorporates the full model including our two main effects and two moderating relationships. In addition to the results presented in Table 2, we conducted additional analysis to test the robustness of our findings. We tested our hypotheses using Cox proportional hazard models. The results presented in Table 3 confirmed our initial findings in the parametric hazard regression models.

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Insert Table 3 about here
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2.6. IMPLICATIONS AND CONCLUSIONS

Whether and when to adopt a new technology is among the most important decisions that managers deal with (Barden, 2012; Beardsley, Enriquez, and Garcia, 2004; Rai and Patnayakuni, 1996; Christensen, Suarez and Utterback, 1998), especially in rapidly changing industries. Our paper explores this by studying the adoption of 4G technology by national subsidiaries of mobile telecommunications firms. Our findings reveal that a greater proportion of other subsidiaries within the firm that have already adopted the new technology delays the focal subsidiary's adoption, while a greater proportion of other firms in the host country that have already adopted that technology accelerates the subsidiary's adoption. In addition, the focal subsidiary's strong performance in the host country exacerbates the negative effect it experiences from other subsidiaries, leading to a slower adoption of 4G technology.

Through our further analyses, we are able to identify and rule out other explanations. One driver of a faster adoption of 4G technologies in subsidiaries of a particular MNC could be that such firm has released a mandate to adopt the new technology in a given timeframe. To address

this issue, we use parents fixed effects to control not only for systematic differences across headquarters (e.g., financial resources) but also for potential mandates released by them. Indeed, when we do take into account parents fixed effect, the negative effect of competitive pressure from other subsidiaries disappears. This finding confirms the idea that, controlling for parent-level mandates, subsidiaries have autonomy in deciding when to adopt a new technology. It is also reasonable to assume that high performing subsidiaries (those with a high market share), could be low-cost subsidiaries or in other words, the cash cows of the BCG matrix. In this setting, the best way to account for the low-cost subsidiaries is to control for the percentage of prepaid services that each subsidiary offers. Prepaid or low-cost services, in contrast to postpaid services, are less expensive and therefore designed for cost-conscious customers. Even after controlling for the prepaid services at the subsidiary level, the results of our H3 hold meaning that high performers are slower in adopting the 4G. These findings are in line with our argument that high performing subsidiaries have a low sensitivity to the environmental cues (competitive pressure) in their network.

Through this study, we strive to make several contributions to the literature on technology and innovation management. First, we provide additional insights on the mechanisms of new technology adoption behavior across the national subsidiaries of global firms. Our findings provide fresh insights on the ongoing debates in the literature on subsidiary innovation adoption (Barden, 2012) by juxtaposing both internal and external perspectives on competition. This is in line with the recent call to use a plural theoretical view in studying firm strategic decisions (Peng, Sun., Pinkham, and Chen, 2009). Second, this study highlights the role of competitive positioning in innovation adoption decisions. As such, from a practical point of view, having a monopolistic position could lead to a substantial inertia in adopting emerging

technologies, incurring the risk of keeping obsolete technologies, and subsequently being vulnerable to the threats of new entrants and disruption (Christensen et al., 1997). Relatedly, this study can contribute to our understanding of how firms can respond to disruptive innovation. In this sense, the risks of disruption could be managed if subsidiaries simultaneously leverage on internal technological capabilities (in our case resources within the firm) and pay attention to competitive patterns in the host country (in our case the adoption decision made by other firms).

Examining the influence of competition on the timing of adoption of new technologies by multinational subsidiaries provides managerial insights on how to manage technological change and achieve competitive advantage. The findings of our study call for a close managerial attention to the dynamics within the organization as well as in the local market. In this regard, designing real-time decision support systems can help managers to access important information related to technological trends, such as adoption behaviors among competitors, existing resources and capabilities within the firm, and matrices on the performance of already adopted technologies.

This study opens new areas for studying the underlying mechanisms by which subsidiaries and firms adopt innovation. Scholars can empirically test how third-party developers, which help to increase positive externalities, affect firm's innovation adoption decision. Another fruitful area of research is to examine how institutional elements of the host country (e.g., uncertainty avoidance) can influence the pattern of technology adoption behavior. In addition, future research can categorize innovation adoption decisions into radical and incremental innovations and explore the differential effects of competition on each category.
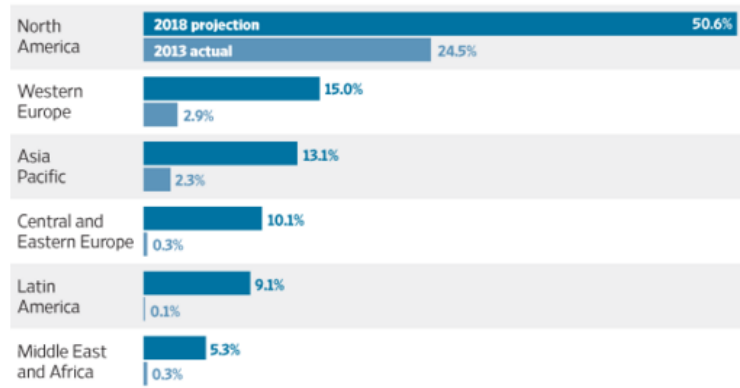
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Figure 1: 4G Penetration- Percentage of active mobile devices with access to 4G by region

North America	2018 projection	50.6%
	2013 actual	24.5%
Western Europe	15.0%	
	2.9%	
Asia Pacific	13.1%	
	2.3%	
Central and Eastern Europe	10.1%	
	0.3%	
Latin America	9.1%	
	0.1%	
Middle East and Africa	5.3%	
	0.3%	

Source: Gordon, Bentley and Barnett, Wall Street Journal, Feb 2014

Figure 2: Annual expenditure on 4G by operators in North America and in Europe, Middle East and Africa
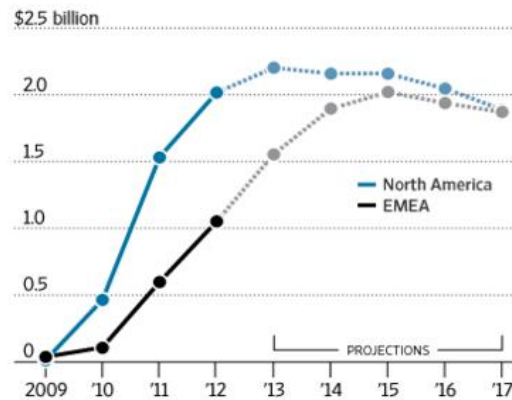
Source: Gordon, Bentley and Barnett, Wall Street Journal, Feb 2014

Figure 3: Capital expenditure for the top three mobile providers in each region by revenue in billion dollars for 2012

Europe	Deutsche Telekom (Europe)	$7.6
	Orange (Europe)	7.5
	Vodafone (Europe)	6.1
Americas	AT&T	19.5
	Verizon	16.2
	América Móvil	9.9
Asia	NTT	25.8
	China Mobile	20.2
	China Telecom	11.5
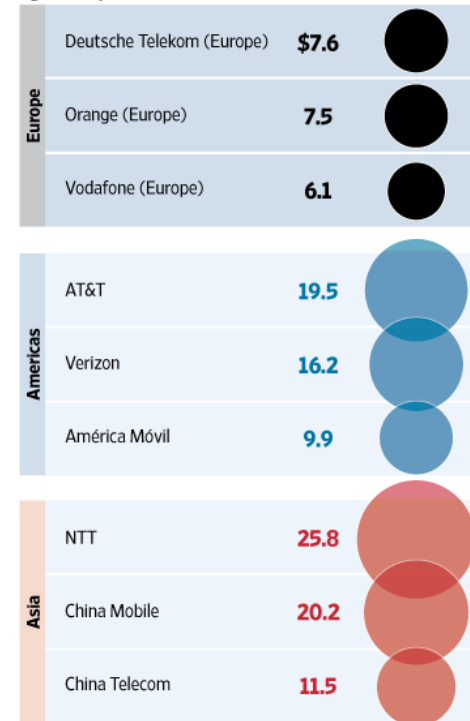
Source: Gordon, Bentley and Barnett, Wall Street Journal, Feb 2014

Table 1: Descriptive statistics and correlations

Variables	Mean	S.D.	Min	Max	1	2	3	4	5	6	7	8	9
1. Subsidiaries proportion$_{(t-1)}$	0.10	0.17	0.00	0.91	1								
2. Competitors proportion$_{(t-1)}$	0.04	0.12	0.00	0.75	0.37	1							
3. High Market share$_{(t-1)}$	0.58	0.49	0.00	1.00	0.01	-0.09	1						
4. Cumulative upgrades in evolution$_{(t-1)}$	1.90	1.21	0.00	8.00	0.19	0.12	0.19	1					
5. Cumulative upgrades in platform$_{(t-1)}$	1.02	0.70	0.00	3.00	0.19	0.08	-0.08	0.42	1				
6. Focal subsidiary's partnerships$_{(t-1)}$	0.13	0.34	0.00	1.00	-0.02	0.09	0.01	0.16	-0.03	1			
7. Ln(parent's subscribers)$_{(t-1)}$	17.86	1.42	8.52	20.49	-0.05	-0.08	0.15	0.16	0.04	0.08	1		
8. Population penetration$_{(t-1)}$	96.97	39.22	0.00	324.20	0.16	0.17	-0.05	0.28	0.23	0.24	-0.02	1	
9. First 4G in region dummy$_{(t-1)}$	0.57	0.50	0.00	1.00	0.44	0.26	0.02	0.23	0.16	0.06	0.03	0.25	1

Table 2: Weibull regression log relative-hazard models showing the effects of competition on a subsidiary's timing of adoption of 4G technology[a]

Variables[b]	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio
Subsidiaries proportion$_{(t-1)}$			-4.64**	0.01	-4.81**	0.01	-3.67**	0.03	-4.80**	0.01	-3.66**	0.03
			(0.93)		(0.91)		(1.00)		(0.91)		(1.01)	
Competitors proportion$_{(t-1)}$					2.02**	7.57	2.04**	7.69	2.25**	9.51	2.01**	7.43
					(0.35)		(0.35)		(0.50)		(0.52)	
Subsidiaries proportion$_{(t-1)}$ × High Market share$_{(t-1)}$							-2.15**	0.12			-2.17**	0.11
							(0.81)				(0.85)	
Competitors proportion$_{(t-1)}$ × High Market share$_{(t-1)}$									-0.41	0.66	0.06	1.07
									(0.68)		(0.73)	
High Market share$_{(t-1)}$	0.20	1.22	0.20	1.22	0.30*	1.35	0.89**	2.43	0.38**	1.46	0.88**	2.41
	(0.16)		(0.16)		(0.17)		(0.28)		(0.19)		(0.28)	
Cumulative upgrades in evolution $_{(t-1)}$	0.30**	1.35	0.30**	1.35	0.28**	1.32	0.28**	1.32	0.28**	1.32	0.28**	1.32
	(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)	
Cumulative upgrades in platform$_{(t-1)}$	0.04	1.04	0.02	1.02	0.03	1.03	0.03	1.03	0.04	1.04	0.02	1.02
	(0.14)		(0.14)		(0.14)		(0.14)		(0.14)		(0.14)	
Focal subsidiary's partnerships$_{(t-1)}$	0.45**	1.57	0.37*	1.45	0.22	1.24	0.22	1.25	0.22	1.25	0.22	1.25
	(0.21)		(0.20)		(0.20)		(0.20)		(0.20)		(0.20)	
Ln(parent's subscribers)$_{(t-1)}$	0.21	1.24	-0.00	1.00	0.03	1.03	0.01	1.01	0.03	1.03	0.01	1.01
	(0.13)		(0.14)		(0.13)		(0.13)		(0.13)		(0.13)	
Population penetration$_{(t-1)}$	0.01**	1.01	0.01**	1.01	0.01**	1.01	0.01**	1.01	0.01**	1.01	0.01**	1.01
	(0.00)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
First 4G in region$_{(t-1)}$	1.34*	3.81	0.93	2.55	0.97	2.63	0.87	2.39	0.97	2.64	0.87	2.38
	(0.75)		(0.75)		(0.78)		(0.77)		(0.78)		(0.77)	
Constant	-27.67**	0.00	-35.75**	0.00	-34.52**	0.00	-35.71**	0.00	-34.69**	0.00	-35.68**	0.00
	(3.03)		(4.43)		(4.33)		(4.27)		(4.34)		(4.27)	
Observations	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512
Region[c] FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Parent FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

[a] Robust standard errors (clustered at the subsidiary-level) in parentheses

[b] Significance levels: ** $p<0.05$, * $p<0.1$

[c] Regions include the U.S., Western EU, Eastern EU, Asia, Middle East, Africa, and Latin America

Table 3: Cox proportional hazard models showing the effects of competition on a subsidiary's timing of adoption of 4G technology[a]

Variables[b]	Model (1) Estimate	Hazard ratio	Model (2) Estimate	Hazard ratio	Model (3) Estimate	Hazard ratio	Model (4) Estimate	Hazard ratio	Model (5) Estimate	Hazard ratio	Model (6) Estimate	Hazard ratio
Subsidiaries proportion$_{(t-1)}$			-2.54**	0.08	-2.69**	0.07	-1.87**	0.15	-2.69**	0.07	-1.85**	0.16
			(0.83)		(0.81)		(0.90)		(0.81)		(0.91)	
Competitors proportion$_{(t-1)}$					2.29**	9.88	2.28**	9.77	2.41**	11.16	2.17**	8.79
					(0.35)		(0.35)		(0.47)		(0.50)	
Subsidiaries proportion$_{(t-1)}$ × High Market share$_{(t-1)}$							-1.55**	0.21			-1.60**	0.20
							(0.71)				(0.77)	
Competitors proportion$_{(t-1)}$ × High Market share$_{(t-1)}$									-0.23	0.80	0.20	1.22
									(0.65)		(0.71)	
High Market share$_{(t-1)}$	0.20	1.22	0.19	1.21	0.31*	1.37	0.73**	2.08	0.36*	1.43	0.71**	2.04
	(0.16)		(0.15)		(0.16)		(0.26)		(0.18)		(0.25)	
Cumulative upgrades in evolution $_{(t-1)}$	0.30**	1.35	0.30**	1.36	0.27**	1.31	0.27**	1.32	0.27**	1.32	0.27**	1.31
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Cumulative upgrades in platform$_{(t-1)}$	0.05	1.05	0.03	1.03	0.05	1.05	0.04	1.05	0.05	1.05	0.04	1.04
	(0.13)		(0.13)		(0.13)		(0.14)		(0.13)		(0.13)	
Focal subsidiary's partnerships$_{(t-1)}$	0.44**	1.55	0.40**	1.49	0.22	1.24	0.22	1.24	0.22	1.25	0.22	1.24
	(0.20)		(0.19)		(0.19)		(0.19)		(0.19)		(0.19)	
Ln(parent's subscribers)$_{(t-1)}$	0.12	1.13	-0.00	1.00	0.03	1.03	0.02	1.02	0.04	1.04	0.02	1.02
	(0.12)		(0.12)		(0.10)		(0.11)		(0.11)		(0.11)	
Population penetration$_{(t-1)}$	0.01**	1.01	0.01**	1.01	0.01**	1.01	0.01**	1.01	0.01**	1.01	0.01**	1.01
	(0.00)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
First 4G in region$_{(t-1)}$	1.40*	4.04	1.31*	3.70	1.39*	4.00	1.31*	3.72	1.39*	4.00	1.31*	3.72
	(0.78)		(0.78)		(0.80)		(0.80)		(0.80)		(0.80)	
Observations	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512	8,512
Region FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Parent FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

[a]Robust standard errors (clustered at the subsidiary-level) in parentheses

[b] Significance levels: ** $p<0.05$, * $p<0.1$

Essay 3

The Non-market Response to Performance Feedback: An Institutional Perspective

ABSTRACT

Building on performance feedback theory and the core tenets of neo-institutionalism, we explain firm aspiration-driven engagement in corporate social responsibility (CSR) as an important facet of a firm's nonmarket strategy. More specifically, we theorize and empirically demonstrate that firms are more likely to increase their engagement in CSR when they exceed their financial objectives (overperform relative to a predetermined aspiration level). Furthermore, we conceptualize and empirically verify the contingent effect of salient attributes of the institutional environment on firm aspiration-driven engagement in CSR. The positive effect of overperformance on CSR engagement amplified when firms are operating in countries in which regulatory, normative, and cognitive institutions demand, trigger, and incentivize actions that are viewed as socially responsible. Our study contributes to the performance feedback theory and CSR literature and opens up new avenues for future research.

Keywords. Performance Feedback, Nonmarket Strategy, Corporate Social Responsibility, Institutions

3.1. INTRODUCTION

Performance feedback theory (Bromiley, 1991; Greve, 1998), which draws on insights from the behavioral theory of the firm (Cyert & March, 1963) and prospect theory (Kahneman & Tversky, 1979), has been one of the dominant theoretical perspectives for studying firm strategic actions. Performance feedback refers to deviations of a firm's financial performance from an ideal aspiration level (Greve, 2003). An assessment of such deviations informs decision-making on future strategic actions. More specifically, building on the assumption of bounded rationality of organizational actors and their risk-taking behaviors, the performance feedback literature establishes a link between a firm's performance relative to its aspirations and its behavior in selecting and pursuing strategic choices. Rooted in performance feedback theory, our study is motivated by two main observations.

First, drawing on the logic of performance feedback, scholars have studied a wide range of strategic choices, including growth (Audia & Greve, 2006; Greve, 2008), mergers and acquisitions (Haleblian, Kim, & Rajagopalan, 2006; Iyer & Miller, 2008), diversification (McDonald & Westphal), market expansion (Barreto, 2012), and internationalization (Jung & Bansal, 2009). A careful review reveals that prior research is primarily focused on *market-based* strategies, with scant attention paid to the relationship between a firm's performance feedback and its pursuit of *nonmarket* strategies (the exception being Rudy & Johnson, 2016). A nonmarket strategy is defined as "a firm's pattern of actions to improve its performance by managing the institutional or societal context of economic competition" (Mellahi, Frynas, Sun, & Siegel, 2016: 2). From a managerial point of view, this gap is especially surprising considering the increasing trend of firms' efforts to broaden and diversify their strategy portfolios to include nonmarket strategies (Mellahi et al., 2016). Indeed, Bach and Allen's (2010) study showed that

"in a global economy, sustained competitive advantage arises from tackling social, political, and environmental issues as part of the corporate strategy—not just pursuing business as usual" (p. 41).

Second, in addition to the lack of attention to nonmarket strategies in the performance feedback research literature, prior research has been unbalanced in exploring different *risk behaviors*, namely, risk taking and risk aversion. The risk-taking approach, rooted in the early works on the behavioral theory of the firm (Cyert & March, 1963), has been the subject of the majority of prior studies. This type of risk behavior manifests itself when firms experience problems as a result of an underperformance gap between aspired and actual performance, i.e., a performance shortfall. Risk-averse behavior, in contrast, has received less attention despite acknowledgment of its importance (e.g., Hu, Blettner, & Bettis, 2011; Lim & McCann, 2013). Prior studies have pointed out the tendency of highly performing organizations to become inertial (Leonard-Barton, 1992), resulting in a decreased propensity to take risks (Singh, 1986; March & Shapira, 1987). As a result, a firm's ruling coalition engages in low-risk action to maintain their success (Palmer & Wisemen, 1999) which is consistent with the "fat cat" phenomenon (Hedberg, Nystrom, & Starbuck, 1976). Therefore, focusing on risk-averse behaviors, specifically in the context of nonmarket strategies, would provide fresh insights into the diversity and extent of strategic choices that firms pursue in response to performance feedback.

To address these gaps in the literature, we examine how performance feedback affects a firm's engagement in corporate social responsibility (CSR), as an important facet of nonmarket strategies. We define CSR as "actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (McWilliams & Siegel, 20010: 117). In

addition, we explore the extent to which aspiration-driven engagement in CSR is affected by the institutional context in which a firm is embedded. Recent studies adopting the behavioral theory of the firm have pointed to a need for integration of the effects of performance feedback and country-level institutions (Gavetti, Greve, Levinthal, & Ocasio, 2012). Related to the focus of our study, Doh, Lawton, and Rajwani (2012) suggested that the institutional context plays an important role in firm engagement in nonmarket strategies.

Drawing on performance feedback theroy (Bromiley, 1991; Greve, 1998) and institutional theory (Scott, 1995), we propose a conceptual model to explain the heterogeneity in CSR engagement triggered by performance feedback. Specifically, we argue that firms increase their engagement in CSR when their financial performance exceeds their aspiration levels, i.e., firm overperformance. Furthermore, we integrate neo-institutionalist theory (Scott, 1995) into our conceptual model and conjecture that a firm's aspiration-driven engagement in CSR is shaped by the institutional setting. More specifically, we investigate the contingent effects of regulative, cognitive, and normative institutions on the relationship between performance feedback and CSR engagement. We empirically test our theoretical model using a 12-year panel of 1,107 firms operating in 36 countries and find broad support for our hypotheses.

Our study makes several contributions to the literature. First, we theoretically and empirically extend the applicability of performance feedback theory by linking it to CSR engagement as a key exemplar of a nonmarket strategy. (Dorobantu, Kaul, & Zelner, 2017; Mellahi et al., 2016). Second, we contribute to the extant literature on performance feedback by recasting and framing CSR as a risk avoidance strategy once financial goals and expectations are met. Third, integrating the behavioral and institutional theories, our paper provides an interactionist perspective on firm aspiration-driven pursuit of nonmarket strategies.

3.2. THEORY AND HYPOTHESES

3.2.1. Performance feedback and nonmarket strategies

Performance feedback theory, which integrates insights from the behavioral theory of the firm (Cyert & March, 1963) and prospect theory (Kahneman & Tversky, 1979), is one of the most influential research traditions in strategy research (Gavetti et al., 2012; Bromiley, 2009). Building on the concepts of bounded rationality and organizational risk-taking behavior, performance feedback theory views firms as coalitions of stakeholders that assess relative firm performance (gap between actual and aspired performance) to make a determination on future strategic actions (Cyert & March, 1963; Bromiley, 1991).

Prior research has explored a large number of strategic actions as a response to performance feedback, and primarily performance shortfalls. A careful review of the relevant literature reveals that most studies have been primarily focused on the role of a firm's relative performance in explaining the future pursuit of *market-based strategies* (e.g., diversification, innovation, internationalization). Surprisingly, little attention has been paid to the impact of performance feedback on a firm's decision to pursue *nonmarket strategies*. A growing body of literature shows that nonmarket strategies have a significant impact on different aspects of organizational performance, including sustainable competitive advantage and survival (e.g., Bach & Allen, 2010; Doh et al., 2012). These insights explain the increasing pressure firms experience to adopt a stakeholder orientation to ensure responsiveness to salient players in their environment (Mitchell, Agle, & Wood, 1997). Indeed, the formal incorporation of nonmarket strategies into the existing mix of a firm's behavioral responses yields a more holistic understanding of firm strategic behaviors (Baron, 1995) and will further advance the performance feedback research program.

Two strands of research have shaped the literature on nonmarket strategies (Mellahi et al., 2016). The first one explores corporate political activity, which is concerned with a firm's effort to influence major political players in its operating environment (Hillman & Hitt, 1999) with the aim to improve or preserve corporate performance. The second strand studies *corporate social responsibility* (CSR), which is the focus of the current study. Dorobantu et al. (2017) framed CSR as a proactive nonmarket strategy that firms pursue by creating lower-level decentralized institutions with the goal of maintaining their profitability, improving their performance in the long term, and insuring themselves against potential reputational risks. Building on these insights and drawing on the CSR and performance feedback literatures, we conceive of CSR engagement as a risk-averse behavioral response to positive performance feedback.

Despite a long tradition of research into CSR, there is no consensus on what comprises it. The reason, as Matten and Moon (2008: 405) pointed out, is that CSR is "an essentially contested concept, appraisive (or considered as valued), internally complex, and having relatively open rules of application." These issues make defining CSR a challenging task. While some scholars believe that socially responsible behaviors are those that are required by law (Campbell, 2007), other scholars extend the domain of CSR to those behaviors that also go beyond obeying the law (McWilliams & Siegel, 2001). Given our focus on CSR as a form of strategy, we favor an approach that not only sees CSR as abiding by laws but also considers some actions that firms pursue voluntarily to conform to or even exceed societal norms with the ultimate goal of improving their performance.

3.2.2. Performance feedback and institutional context

The context in which firms are located can affect decisions taken in response to performance feedback (Greve, 1998; Latham & Braun, 2009; McKinley, Latham, & Braun, 2014; Mone, McKinley, & Barker, 1998). Few studies have used attributes of the institutional context in studying aspiration-driven strategies. In the baseball industry, Wezel & Saka-Helmhout (2006) investigated the role of institutional stability on aspiration-driven organizational change. Their results revealed that aspirations have a significant effect on organizational change during periods of institutional stability, while their role was not found to be significant during times of high institutional instability. More recently, Salge, Kohli, and Barret (2015) studied search behaviors for information system investments in the health care industry and showed that regulative legitimacy alters the link between prior performance and reliance on different forms of search strategies. More specifically, the authors found that low levels of regulative legitimacy led to less reliance on slack search, more reliance on mimetic search, and high reliance on institutionalized search.

To gain a better understanding of the role of institutional setting in informing the decision to engage in CSR, in the next section, we review how the institutional context affects CSR engagement and then proceed by integrating the literatures of performance feedback, neo-institutional theory, and CSR to develop our conceptual model.

3.2.3. Institutional context and CSR

Institutions have been incorporated into the study of CSR through a number of conceptual studies that borrowed extensively from neo-institutional theory (DiMaggio & Powell, 1983; Scott, 1995) to elaborate on the effects of formal and informal societal arrangements on firms' socially responsible behaviors. More specifically, studies in this area have theorized on the role of sociocultural systems (Jones, 1999), NGO presence, media, educational systems (Campbell,

2007), and pressure from civil communities (Fransen, 2013). A second wave of studies used the *varieties of capitalism* perspective (Hall & Soskice, 2001), comparing CSR approaches across multiple countries and linking these approaches to the institutional constellation at the national level (Chen & Bouvain, 2009; Doh & Guay, 2006; Jackson & Apostolakou, 2010; Matten & Moon, 2008). Theoretical advancements on the nexus of institutional setting and CSR have spurred a number of empirical studies that leveraged cross-country research designs to test the validity of prior theorizing efforts.

Ringov and Zollo (2007) focused on the impact of national culture on social performance. Drawing on Hofstede's national culture framework, they found that firms located in countries with higher levels of power distance, individualism, masculinity, and uncertainty avoidance score lower on social and environmental performance. In another study based on the national business systems perspective, Ioannou and Serafeim (2012) investigated the impact of political, educational, labor, financial, and cultural systems on corporate social and environmental performance. They found that political, labor, educational, and cultural systems have a significant impact on social and environmental performance, while the impact of the financial system is less significant. Waldman and colleagues tested the effects of cultural and leadership contexts on the social responsibility values of top management team members. Their results showed how cultural and organizational level variables such as institutional collectivism and leadership integrity affect managerial belief systems regarding CSR and their effects on relevant decision-making (Waldman et al., 2006). Recently, Flammer (2015) found that the returns on CSR are higher for firms in industries where institutional norms are higher than those operating in industries with more lax institutional norms. In sum, prior research supports the important role of the institutional context on firms' willingness to pursue socially responsible behavior.

3.2.4. Conceptual model

Building on the insights from performance feedback and neo-institutional theories, we develop a conceptual model to explain variations in CSR engagement among firms in response to performance feedback depending on the country they are located in. We will first theorize the relationship between performance feedback and firms' CSR engagement. Prior research on performance feedback in the literature suggests that firms engage in different search activities in response to their relative financial performance (to a predetermined aspiration level). The extent and type of search activities can determine the proportional attention of top management to short-term vs. long-term goals (Cyert & March, 1963; Greve & Zhang, 2016). In this vein, the distribution of attention between goals with varying levels of urgency is influenced by a firm's prior performance in the market. Problemistic search behavior induced by underperformance is usually associated with a risk-seeking pursuit of short-term goals in response to performance below aspirations (Greve, 2003). Overperformance search, in contrast, is triggered by successfully meeting or exceeding firm performance expectations (i.e., the desired aspiration level) and is associated with the pursuit of less risky actions (Bromiley, Miller, & Rau, 2001; Nickel & Rodriguez, 2002). By conceiving of nonmarket strategy, and specifically CSR engagement, as a long-term risk-reducing strategic choice (e.g., Godfrey, Merrill, & Hansen, 2009; Jo & Na, 2012), we theorize on the link between performance above and below aspiration levels, on the one hand, and the level of CSR engagement sought by firms on the other hand.

Second, we examine the moderating effect of the institutional context on our principal relationship. More specifically, we argue that firms located in different countries experience various levels of conformity pressures and thus have varying (dis)incentives to integrate CSR in their strategy portfolio. To formally incorporate the institutional context, in line with prior

studies on the institutional determinants of CSR (e.g., Young & Makhija, 2014), we integrate the three-pillar framework introduced by Scott (1995) with the country institutional profile approach proposed by Kostova (1999). Scott's (1995) framework divides the elements of the institutional environment into regulative, cognitive, and normative institutions. Regulative institutions subscribe to the formal, regulatory sanctions imposed by the government or institutions with appropriate authority to control and direct the behaviors of corporations (Campbell, 2007). Cognitive institutions reflect the "cognitive structures and social knowledge shared by the people in a given country" (Kostova, 1999: 181). Normative institutions embody those rules that bring a prescriptive, evaluative, and obligatory aspect to social life (Scott, 1995). The focus of normative institutions is on the collective values and norms, beliefs, and assumptions about human nature and human behavior.

Kostova (1999) proposed that scholars need to create a domain-specific country institutional profile when they want to study the effect of the national setting on firm behavior. More specifically, she suggested the conceptualization of a three-dimensional construct encompassing regulatory, cognitive, and normative components that are theoretically anchored in the phenomenon under study. Adopting this perspective, we reviewed the prior literature to identify the most relevant institutional attributes in the context of CSR to create a construct—a socially supportive institutional profile—that consists of three composite dimensions: (1) socially supportive regulative institutions, (2) socially supportive cognitive institutions, and (3) socially supportive normative institutions.

In the context of CSR, there are numerous regulations that are enforced by governments to ensure that corporations adhere to a minimum level of socially accepted behavior. The overall effectiveness of government in the creation and enforcement of such rules has a strong effect in

altering the behaviors of firms regarding their engagement in CSR (Campbell, 2007). To uniformly account for regulatory pressure across institutional settings, and by drawing on prior research (Ioannou & Serafeim, 2012; Young & Makhija, 2014), we create the first dimension—socially supportive regulative institutions—that consists of three attributes: regulatory quality, government effectiveness, and labor regulations.

Cognitive structures and schemas—shared in a social context in which the firm operates—will change firm behavior toward more accepted social practices. In this regard, prior research has emphasized the role, missions, and activities of nongovernmental organizations (NGOs), the educational system, unions, public opinion, the media, and social organizations in influencing the CSR orientation of firms (Campbell, 2007; Ioannou & Serafeim, 2012). In our study, we capture these attributes by creating a second dimension—socially supportive cognitive institutions—that consists of two attributes: openness of the public sphere and overall educational attainment at the society level.

Finally, normative institutions have been studied mainly through the incorporation of elements of national culture based on the Hofstede and GLOBE studies (Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004). To capture the effect of national culture, we create a third dimension—socially supportive normative institutions—that consists of three attributes of the GLOBE study that are pertinent to the domain of CSR (Young & Makhija, 2014; Parboteeah, Hoegl, & Cullen, 2008): empathy, human orientation, and gender egalitarianism.

In the method section, we provide more details on the operationalization of our institutional constructs. Figure 1 illustrates our hypothesized relationships.

<<Insert Figure 1 about here>>

3.2.5. Main hypothesis

Decision-making is at the heart of managing organizations. The performance feedback literature suggests that a firm's ruling coalition makes decisions to satisfy organizational aspirations. Aspiration levels are critical reference points that managers use to benchmark against firm financial performance. The gap between aspirations and firm performance can direct future strategic behavior (Audia & Greve, 2006; Bromiley, 1991). In other words, the nature of firm strategic behavior is determined by the level of relative financial performance at a given point in time. Firms with a negative performance gap—performance below their aspirations—will look for solutions that help them to improve their performance and be more willing to take on risks (Greve, 2011). Because low financial performance relative to aspiration level is an undesirable outcome, it triggers problemistic search (Gavetti et al., 2012, Greve, 2003).

Problemistic search (which is the subject of the majority of research in the performance feedback literature) in underperforming firms helps to bring financial performance back to the aspiration level as soon as possible through riskier actions. This was clearly demonstrated in the shipbuilding industry, when shipbuiders increased R&D expenditures when experiencing low performance (below aspirations) (Greve, 2003), to create innovations that would bring performance back to the aspiration level. Boundedly rational managers who engage in problemistic search tend to focus on short-term goals (Greve et al., 2016). Such managers, under constant pressure to improve the firm performance, tend to focus more on the immediate stakeholders, and in particular shareholders. Managers in underperforming firms are quite unlikely to be sufficiently forward-looking (Chen, 2008) to address a wider group of stakeholders, such as customers and the community. In other words, underperforming firms are more likely to adopt a shareholder primacy orientation (Smith, 1997) when the very survival of

the firm is at stake. In this case, shareholders become the most urgent and salient stakeholders to attend to.

In addition to adhering to a shareholder primacy approach, underperforming firms tend to look for solutions similar to their previously applied ones and are closely linked to the problem (Greve, 2003). In this sense, firms exploit market strategies that have worked in the past and are closely related to improvements in firm market value such as innovations (Greve, 2003) and resource reconfiguration (Vidal & Mitchell, 2015). Firms under such conditions are less likely to invest in long-term nonmarket initiatives such as CSR, as these will not address the performance shortfall in the short term.

As firms move toward closing the performance gap relative to the aspiration level, and particularly when they overperform, the ruling coalition will start to adopt a more risk-averse approach to maintain the status quo (Vidal & Mitchell, 2015). Drawing on insights from the CSR as insurance literature (Godfrey et al., 2009; Jo & Na, 2012; Orlitzky & Benjamin, 2001; Peloza, 2006), we argue that overperforming firms are being more risk averse and therefore more likely to increasingly engage in CSR.

First, CSR investment is a means to preserve financial performance by providing an insurance-like protection for firms (Godfrey et al., 2009). This preservation property helps the overperforming firms to continue their successful financial track record without a need to engage in riskier strategic actions such as mergers and acquisitions or new product development. Second, increased adoption of CSR initiatives creates more opportunities for the ruling coalition to develop a pluralistic view of their stakeholders. This inclusive view, in turn, will result in more instances in which firms can respond to the needs of secondary stakeholder groups, such as environmental groups and the community. Improved relationships with such stakeholder groups

decrease the likelihood of unexpected surprises (such as strikes, protests, and negative media coverage) that threaten a firm's reputation and help a firm to decrease the variability of their business returns (King, 1995; Orlitzky & Benjamin, 2001). In sum, we propose that:

H1. Performance deviation from the aspiration level is associated with higher levels of CSR engagement when firm performance is above the aspiration level.

3.2.6. The moderating role of the institutional context

In this section, we propose that the institutional context of the country in which a firm operates affects the degree of its aspiration-driven CSR engagement. Through H1, we establish that performance feedback results in higher CSR engagement only when firms exceed their financial aspirations, and we focus our theorizing on the moderating effect of socially supportive institutions on the overperformance-CSR engagement link. The overarching crux of our arguments is that the institutional context, through pressurizing and/or incentivizing mechanisms, alters the risk-reducing potential of engaging in CSR perceived by the ruling coalition in overperforming firms.

Socially supportive regulatory institutions. The regulatory environment of the country in which a firm is located has implications for how much firms perceive risk in being known as socially irresponsible. This aspect of the institutional context influences the firm overperformance-CSR engagement link primarily through two legitimacy-enhancing mechanisms: compliance and conformity (Carroll, 1991; van Marrewijk, 2003). First, to be able to meet their profit motives while at the same time avoiding the risk of being in violation of regulations, firms need to fulfill the minimum level of legal requirements and be viewed as socially responsible corporate citizens (complinace). When regulatory institutions are strong, the consistency and predictability of rules and their enforcement provide firms with a clear

understanding of their obligations and the risk of not adhering to them (Henisz, 2000). Therefore, financially overperforming (and hence risk-averse) firms in countries with effective regulatory processes and entities for enforcement and monitoring of rules and regulations are more likely to assign a higher priority to CSR activities, in order to comply with the law. Lack of compliance, in such settings, would result in financial and legal sanctions that may damage the firms' reputation and even endanger their very existence and ability to sustain their financial performance (Henriques & Sadorsky, 1996). For instance, overperforming firms that operate in a country with strong pollution prevention and enforcement laws could be expected to allocate more resources to projects focused on environmental protection compared to their counterparts operating in a country with fewer environmental regulatory mandates, to be in compliance and avoid risking reputational damage (Philippe & Durand, 2011). The managers of financially overperforming firms have an easier time convincing shareholders of the necessity for such investments and the increased risk of not doing so—such as financial penalties or even closure of facilities (Deephouse & Carter, 2005; Johnson, Dowd, & Ridgeway, 2006). In contrast, in the context of weak regulatory institutions, the absence of regulation enforcement would decrease the reputational risk of being identified as an irresponsible firm. As a result, when it comes to allocating resources to social and environmental initiatives, decision makers would be less likely to anticipate the benefits associated with building legitimacy through compliance (Suchman, 1995) and subsequently would be less inclined to increase their engagement in CSR.

Second, through conformity pressures, transparent and widely accessible rules and effective governing bodies for enforcing regulations would result in higher levels of CSR engagement in response to firm overperformance. In countries with a strong regulatory environment, firms are under constant scrutiny by public opinion that is informed by records and

publications disclosed by monitoring bodies (Fung & O'Rourke, 2000). As a result, overperforming firms in such countries would feel a more urgent need to direct their resources and attention to CSR to minimize their reputational risk and conform to societal expectations. Labor regulations are a notable instance in this regard, as labor unions—an important stakeholder—watch over the proper implementation and enforcement of labor regulations. These regulations cover areas such as minimum wage, working hours, hiring and firing policies, retirement and social security benefits, and workplace safety. The consistency and enforcement quality of such regulations and the availability of information regarding employee relation practices of firms can affect the degree to which the ruling coalition allocates its aspiration-driven attention to CSR because they are more likely to be cognizant of the undesirable risk of nonconformity triggered by social expectations (Williams & Aguilera, 2008). Hence, we propose that:

H2: *A socially supportive regulatory institutional environment positively moderates the relationship between firm overperformance and CSR engagement.*

Socially supportive cognitive institutions. The primary mechanism through which cognitive institutions moderate the overperformance-CSR engagement link is through a process of sense making (Daft & Weick, 1984). In essence, through scanning of information provided by the media, unions, and NGOs, managers interpret the data that will shape their mental representation of reality (Daft & Weick, 1984; Weick, 1995). More specifically, the sense-making process helps the ruling coalition in overperforming firms to estimate the risk-reduction potential of engaging in CSR and its subsequent importance in the firm's strategic portfolio. We argue that cognitive institutions alter the perceived benefits of CSR engagements.

In societies with socially supportive cognitive institutions, social movement organizations have more freedom and flexibility to provide a counterbalance to corporate power and inform and pressure the decision-makers of firms to move CSR initiatives to the top of their strategic agenda (Doh & Guay, 2006). This pressure is exerted through different channels. First, social movement organizations design and execute media campaigns to increase public awareness about the behaviors of firms and organize social events to condemn and denounce irresponsible behaviors (Aguilera, Rupp, Williams, & Ganapathi, 2007; Boynton, 2013). The role of NGOs in the case of trade in genetically modified organisms (GMOs) is a demonstrative example in this regard. The relatively stronger influence of NGOs in European countries in 2003, compared to their US counterparts, shaped the public opinions, and consequently the national-level policies, for more detailed labeling of food products with a certain percentage of GMO ingredients. At the same time that this was taking place, NGOs in the United States did not succeed in triggering such labeling obligations because of weaker activism and the significant lobbying activities of the bio-agricultural industry in Washington, DC (Doh & Guay, 2006).

Second, pressure on the ruling coalition of firms is channeled through print and broadcast journalists and other media outlets, which have higher levels of freedom to do their job as a constant monitoring entity with a unique ability to expose corporate scandals to both public opinion and government officials (Zyglidopoulos, Georgiadis, Carroll, & Siegel, 2012). The information provided by the media will be picked up by the ruling coalition in overperforming firms through their scanning activities, motivating them to modify their mental model regarding the risk/reward calculations of CSR engagement. In the absence of both social movement organizations and a free, scrutinizing press, firms that overperform are less likely to engage in CSR-related activities. In sum, we propose that:

H3: *A socially supportive cognitive institutional environment positively moderates the relationship between firm overperformance and CSR engagement.*

Socially supportive normative institutions. When firms are embedded in a society that stresses humanistic, equal, and caring behavior, it is likely that the organizational culture will reflect some aspects of these cultural traits as well (Smith, Dugan, & Trompenaars, 1996). In these cultures, members of the organization are more likely to understand the needs and concerns of other members inside and outside of the organization and have an altruistic approach toward others. This is specifically important when it comes to the ruling coalition. The leniency mind-set that is reinforced by socially supportive cultures influences the strategic choices (in response to overperformance) in favor of CSR initiatives. In such cultures, managers are more likely to assign higher priority to CSR initiatives because their value system sets higher expectations for responsible corporate behavior and they are more likely to perceive the protective benefits of such behaviors. A case in point is that of many Scandinavian firms, where having an individual in the top management team in charge of CSR reflects the importance the firms assign to responsible corporate behavior and mirrors the values system of the broader Scandinavian culture (Strand, 2013). This culture has a humanistic orientation—one in which gender equality and empathy are core societal attributes and in which firms have a long history of collaborating with all relevant stakeholders (Morsing, Midttun, & Palmás, 2007). As a result, when these firms are designing their strategic portfolio based on positive feedback, CSR engagement would be more likely to have a strategic appeal for them as a risk-reducing option. In addition, in socially supportive cultures shareholders and members of the boards are more likely to be cooperative and tolerant when the time comes to decide on investments in social initiatives like community

engagement, philanthropic activities, and benefit programs because they are aware of the higher levels of reputational risk that do not invest in responsible behaviors (Strand, 2013).

Finally, in socially supportive cultures, societal values that are used to judge corporate practices increasingly set higher standards for CSR (Gjolberg, 2010). In other words, an overperforming firm that is operating in a country with a high level of cultural support for humanistic behavior, all other things being equal, is expected to engage in more CSR initiatives than its counterpart in a country with a lower level of cultural expectation for such initiatives. Thus, corporations in socially supportive cultures need to invest more in social activities and initiatives that serve the interests of multiple stakeholder groups to reduce their legitimacy risk and achieve the required "social license" for operation. As such, we propose that:

H4: *A socially supportive normative environment positively moderates the relationship between firm overperformance and CSR engagement.*

3.3. SAMPLE AND METHOD

We assembled our data set by merging data from several sources. The data on CSR engagement of firms was acquired from the Thompson Reuter ASSET4 database. ASSET4 is a third-party database of public firms that provides objective and comparable information in the areas of social performance, environmental performance, corporate governance, and economic performance for more than 3,500 firms. This database has been used in prior cross-country CSR studies (e.g., El Ghoul, Guedhami, & Kim, 2016; Ioannou & Serafeim, 2012). Firm-level data were collected from the Thompson Reuter Worldscope data set. The ISIN code of each firm was used to match firm-level CSR data points obtained from ASSET4 data with the Worldscope database. Following prior research (El Ghoul et al., 2016; Petrenko, Aime, Ridge, & Hill, 2016), we omitted the firms in the financial industry (SIC codes between 6000 to 6999) due to their

different regulatory environment. The country-level and institutional variables were obtained

from several sources. Data on normative institutions were extracted from the GLOBE study

(House et al., 2004), data on regulative institutions were drawn from the World Governance

Indicators database (Kaufmann, Kraay, & Mastruzzi, 2011) and Heritage Foundation's Index of

Economic Freedom (Miller, Kim, & Holmes, 2015), and data on cognitive institutions were

obtained from the Democracy Barometer project (Bühlmann et al., 2011) and the United Nations

Human Development Reports (Sen, 2003). After dropping observations with missing values for

the regression variables, the final sample included 8,511 firm-year-country observations

comprising 1,107 firms spanning twelve years (2004–2015) and 36 countries.

3.3.1. Measures

Dependent variable

CSR engagement. Following prior studies, we leveraged the social and environmental

dimensions of ASSET4 data as the basis for measuring the CSR engagement of a firm in a given

year (El Ghoul et al., 2016; Ioannou & Serafeim, 2012). This choice was made because social

and environmental dimensions in ASSET4 contain a wide array of corporate responsibility

factors that ensure measurement comprehensiveness needed for a large cross-industry study

(Waddock & Graves, 1997). Observations in the Thompson Reuter ASSET4 database are the

result of an independent collection of relevant data from multiple sources, including company

websites, annual reports, stock exchange filings, NGOs' websites, and news sources. To

facilitate quantitative analysis, after gathering the raw data, the analysts transform them into

predefined units. Based on this transformation, ASSET4 provides a z-score that compares the

score of the focal firm to the scores of the rest of the firms in the data set. As a result, the firms

listed in the ASSET4 database range from very low performers to very high performers in terms

of CSR engagement. The social dimension includes assessments in the areas of employment quality, health and safety, training and development, diversity, human rights, community, and product responsibility. Social performance is the aggregate of a company score in the above areas. The environmental dimension includes activities in the areas of emission reduction, resource reduction, and product innovation. Environmental performance is the aggregate of a company score in the above areas.

We followed prior research (e.g., Hillman & Keim, 2001; Ioannou & Serafeim, 2012) and calculated a composite measure of CSR engagement by averaging the social and environmental performance scores for each firm in a given year. In an attempt to assess the impact of this decision on the robustness of our results, we performed a principal component analysis using all the constituent attributes of social and environmental dimensions (see above), and used the first component score as the measure of our dependent variables (see the post-hoc analysis section for more details).

Independent variables

Performance feedback. The independent variable in our research, performance feedback, is the gap between a firm's actual performance and its performance aspiration level. To calculate the gap, we first constructed the historical and social aspiration levels using a firm's return on assets (ROA) in a given year, following prior studies (e.g., Greve, 2003). To calculate the historical aspiration levels (see Equation 1) for firm i in a given period t ($HA_{t, i}$), we used a combination based on its past-period historical performance aspiration level ($HA_{t-1, i}$) and its prior performance ($P_{t-1, i}$). The weight of the combination (a_1) was chosen by starting to estimate models with 0 as the weight and then repeating the estimation with increments of 0.1. We then selected 0.9 because it provided the highest level of model fit in terms of quasi-likelihood under

the independent model criterion (QIC) (Pan, 2001). See the estimation strategy section for more

details.

$$Eq\ (1\ ) \qquad HA_{ti} = a_1 HA_{t-1,i} + (1 - a_1)P_{t-1,i}$$

To calculate social aspiration levels, we followed recent recommendations (Kuusela,

Keil, & Maula, 2016) and used comparable firms' ROA in the focal firm's industry (using 4-

digit SIC codes) in each year as the reference points. The logic behind constructing a comparable

group of firms is that managers are more likely to pay attention to similar and meaningful others

when they engage in social comparison (Festinger, 1954; Fiegenbaum & Thomas, 1995). To

identify comparable firms, we clustered firms based on the value of their assets and sales using a

Euclidean distance and K-means strategy that groups a given data set through a certain number

of clusters (K) determined in advance (Jain, 2010). Then we used the average ROA of other

firms in the focal firm's cluster (excluding the focal firm's ROA) to obtain social aspiration

levels. The results are reported based on the reference group size of K=3, but our models are

robust with values K=3, 4, and 5. For each reference group, we calculated the average ROA

(excluding the focal firm) and used it as the value of the focal firm's social aspiration level SA_{ti}

at time *t*.

In the next stage, we calculated the overall aspiration levels (A_{ti}) by combining the

values of social and historical aspiration levels using Equation 2. The weight of the combination

(a_2) was chosen by starting to estimate models with 0 as the weight and then repeating the

estimation with increments of 0.1. We then selected 0.1 because it provided the highest level of

quasi-likelihood under the QIC (Pan, 2001).

$$Eq\ (2) \qquad A_{ti} = a_2 SA_{ti} + (1 - a_2)HA_{ti}$$

Finally, to obtain a measure of performance feedback and to differentiate the effects of the gap below and above aspiration levels, we used a spline function (Greve, 2003) and split the gap into two variables. Performance above aspirations was constructed by assigning 0 when firm performance was below its aspiration level ($P_{ti} < A_{ti}$). For all other observations, the difference between performance and aspiration level was assigned as the value ($P_{ti} - A_{ti}$). Performance below aspirations was constructed symmetrically by assigning 0 when the firm performance was greater than its aspiration level ($P_{ti} > A_{ti}$). For all other observations, the difference between performance and aspiration level was assigned as the value ($P_{ti} - A_{ti}$).

Country-level variables (moderators)

As mentioned in the theory section, we followed Kostova's (1999) approach to identify relevant institutional dimensions based on Scott's (1995) three-pillar framework. Informed by Kostova (1999), our overall goal was to construct a country institutional profile that is specific to the domain of CSR. In the following, we describe the three dimensions of our socially supportive institutional profile. We draw heavily on the common measures used in CSR, corporate governance, and social entrepreneurship literature. To construct the moderating institutional indices, as follows, we first standardized each variable and then summed up the value to ensure equal weight.

Socially supportive regulative institutions. Informed by Campbell (2007), we defined socially supportive regulative institutions as effective regulatory sanctions imposed by the government or entities with appropriate authority as well as overall enforcement mechanisms to trigger socially responsible behaviors by corporations. To capture both the regulative substance and enforcement effectiveness embedded in this definition, we constructed an index using the following three attributes:

(1) *Labor Regulations* captures the number and stringency of laws related to the treatment of employees, including maximum working hours, standards for minimum pay, pensions and social security, health and safety, and hiring and firing (Beach & Kane, 2008). This variable was measured by reverse-coding the labor freedom variable (Young & Makhija, 2014) from the Heritage Foundation's Index of Economic Freedom Project (Miller et al., 2015).

(2) *Regulatory Quality* captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development (Kaufmann et al., 2011). Our data source was the World Bank Governance Indicators data set.

(3) *Government Effectiveness* captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies (Kaufmann et al., 2011). Our data source was the World Bank Governance Indicators data set.

Socially supportive cognitive institutions. Informed by Kostova (1999), we defined socially supportive cognitive institutions as cognitive structures and knowledge-sharing mechanisms that facilitate the creation and dissemination of socially conscious mind-sets and practices. To tap into this concept, we constructed an index using the following two attributes:

(1) The openness of the public sphere is the degree to which constitutional provisions in a country guarantee the freedom to associate and freedom of speech. We used the variable Public from the Democracy Barometer project to measure this variable (Bühlmann, Merkel, Müller, & Weßels, 2011).

(2) Educational Attainment is proxied by the Education Index of Human Development Index (Anand & Sen, 2003) and is calculated from "expected years of schooling" (number of years a child of school age can expect to spend in a given level of education) and "mean years of schooling" (average number of completed years of education of a population 25 years and older).

Socially supportive normative institutions. Informed by Kostova (1999), we defined socially supportive normative institutions as values, norms, and beliefs that incentivize equal, humanistic, and considerate behavior toward the other members of the society. To measure this concept, we constructed an index using the following three attributes from the GLOBE:

(1) *Empathy* is the degree to which a society appreciates considerate, concerned, and patient behavior toward others. To measure this variable, we reverse coded the assertiveness dimension of the GLOBE study, which reflects aggressive and confrontational behavior toward others (Young & Makhija, 2014, House et al., 2004).

(2) *Human Orientation* is the degree to which individuals in organizations or societies encourage and reward individuals for being fair, altruistic, friendly, generous, caring, and kind to others (House et al., 2004).

(3) *Gender Egalitarianism* is the extent to which an organization or a society minimizes gender role differences and gender discrimination (House et al., 2004).

Control variables

We controlled for firm-level variables that potentially influence the degree of CSR engagement. In line with prior literature (McWilliams & Siegel, 2001), we controlled for firm size (the natural log of total assets in millions of dollars). Larger firms potentially engage in a higher level of CSR activities because they have access to more resources and are more prone to public scrutiny. We

also included R&D expenditures as a proxy of the extent of investment in market-based strategies. Firms with higher R&D expenditures might have less managerial and financial resources available to invest in nonmarket strategies like CSR. To control for the effects of firm slack on CSR engagement, we constructed three slack variables and included them in our regression models (Greve, 2003). Absorbed slack was calculated as the ratio of selling and general and administrative expenses to net sales or revenues. Unabsorbed slack was measured as the ratio of the sum of cash and common stock to total liabilities. Potential slack was constructed by dividing the total debt by common equity. Moreover, we controlled for year effects to capture the influences time trends have on CSR engagement. Finally, we controlled for industry fixed effects using the Fama-French industry classification (Fama & French, 1997) to eliminate the potential influence of industry-specific factors on CSR engagement.

In addition to firm-level controls, we also controlled for the effect of country-level factors. Following prior research (Ioannou & Serafeim, 2012; El Ghoul et al., 2016), we controlled for the influence of a country's general infrastructure (measured using the infrastructure pillar extracted from the Global Competitiveness Report) on the level of CSR engagement exhibited by firms. Moreover, to control for the possible effect of globalization on a firm's decision to engage in CSR, we included the ratio of trade to GDP, using World Bank data. Finally, to capture the potential impact of overall shareholders' power on CSR engagement, we included the Shareholder Rights Index as a variable in our models (Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998).

3.3.2. Estimation strategy

To estimate our model, we used generalized estimating equations (GEE). GEE is useful when the assumptions of independence among observations do not hold (Hardin, 2005). In our sample,

there are firms operating in different industries and countries, which creates a clustered structure. Moreover, CSR engagement is path-dependent, which results in autocorrelation among a firm's observations across the years. In comparison to fixed or random effect models, GEE produces more consistent and robust estimates when autocorrelation is present (Liang & Zeger, 1986). GEE does not assume that the dependent variable has a normal distribution. This has a particular relevance to the current study because our dependent variable, the CSR engagement score, does not follow a normal distribution and has a limited range (0–100). Moreover, GEE is more robust than fixed and random effect models because it allows for multiple correlation matrix structures to best fit the data (Liang & Zeger, 1986). To account for autocorrelation in our dependent variable, we used an order 1 autoregressive correlation structure. In addition to the path-dependency logic, the choice of autoregressive correlation structure was also informed by analyzing models with different correlation structures. The quasi-likelihood under QIC suggested that the highest level of model fit is achieved when an autoregressive correlation structure is specified.

We set a 1-year lag for all our explanatory variables across all of our models. To ensure the robustness of our results, we used robust standard errors in our analysis. Finally, to reduce the potential biasing impact of outliers, we used a 1 percent winsorizing treatment for our performance feedback effects.

3.4. RESULTS

Descriptive statistics are presented in Tables 1, 2, and 3. Table 1 shows the distribution of observations across the 12-year span of our sample, which overall shows an increasing trend, i.e., firms have engaged more in CSR activities in more recent years. Table 2 shows the distribution of the sample by country and the average CSR engagement of firms operating in each country.

Japan is the country with the most observations (2,337), followed by the United States (1,895) and Great Britain (852). Table 3 presents the complete correlation matrix and the descriptive statistics of the variables of our regression models. We tested for multicollinearity using the collin function in Stata. The average VIF was 1.75, which is below the cutoff point value of 10 (Hair, Black, Babin, Anderson, & Tatham, 1998). As such, multicollinearity is not a concern in our analysis.

<<Insert Tables 1, 2, and 3 about here>>

Table 4 presents the results of our regression analysis using the GEE approach. Model 1 includes only control variables. To test the baseline hypothesis (H1) in Model 2, we entered performance feedback as our independent variable in the form of performance below and above aspirations into the model. In Model 3, we included the interaction term between performance above aspirations and socially supportive regulative institutions (H2). Model 4 contains the interaction term between performance above aspirations and socially supportive cognitive institutions (H3). Finally, Model 5 includes the interaction term between performance above aspirations and socially supportive normative institutions (H4). We mean-centered all our institutional variables to ensure comparability of the interaction effects. We coded year and industry effects with a dummy variable for each year or industry and included them in all of our models but have not individually reported them to improve the readability of our results.

The results of our baseline model, Model 1, support prior findings in the CSR literature in that larger firms and those with higher absorbed slack make more investments in CSR. In H1, we framed CSR engagement as a risk-averse behavioral strategy that firms pursue when they meet or go beyond their financial expectations (at or above the aspiration level). More specifically, H1 predicts that there is a positive relationship between performance feedback and CSR engagement

only when firms exceed their financial expectations. Model 2 provides empirical support for this prediction. The estimated coefficient for the variable performance above aspirations is positive and significant (8.260, *p < 0.01*), while the coefficient for performance below aspirations is not significant (-2.174 *p > 0.1*). As a result, H1 is supported. Figure 2 graphically illustrates the relationship between firm performance feedback and its CSR engagement.

<<Insert Figure 2 about here>>

H2 predicts that socially supportive regulative institutions positively moderate the link between performance above aspirations and CSR engagement. The coefficient of the interaction term in Model 3 is positive and strongly significant (13.129, *p < 0.01*). Consequently, H2 is supported. H3 proposes that in countries with stronger levels of socially supportive cognitive institutions, the link between performance above aspirations and CSR engagement is stronger. The coefficient of the interaction term in Model 4 is positive and significant (5.034, *p < 0.1*), which supports H3. Finally, H4 predicts that socially supportive normative institutions positively moderate the relationship between performance feedback and CSR engagement. The interaction term between performance above aspirations and socially supportive normative institutions in Model 5 is positive and significant (7.720, *p < 0.1*). As a result, H4 is supported.

<<Insert Table 4 about here>>

3.4.1. Post-hoc analysis

We performed several post-hoc tests on our findings: 1) examining potential reverse causality between overperformance and CSR engagement; 2) using an alternative operationalization of the dependent variable (i.e., CSR engagement); 3) replacing performance feedback with the raw form of ROA; 4) using different control variables; and 5) choosing different cutoff points for identifying outliers.

First, an important concern related to our findings is the reverse causality between firm overperformance and its CSR engagement (i.e., CSR engagement may result in overperformance). To address this concern, we tested our main hypothesis, H1, with the Arellano-Bond estimator (Arellano & Bond, 1991, Arellano & Bover, 1995). The Arellano-Bond is a generalized method of moments estimator that enables control for reverse causality and unobserved heterogeneity in dynamic panel data. This framework uses all possible lags of regressors as instruments that meet orthogonality conditions (Bertrand & Zuniga, 2006; Uotila, Maula, Keil, & Zahra, 2009). In our estimation procedure, we specified two lags for our dependent variable to be used as instruments. The results obtained using the Arellano-Bond estimator remained qualitatively the same, suggesting that reserve causality is not a concern in testing our main hypothesis. We further tested the relevance of our econometrics model with two postestimation techniques, namely the test of autocorrelation of order m and the Sargan test of overidentification. The findings supported the validity of our model.

Second, we performed a principal component analysis using the 10 subdimensions of social and environmental performance and created a composite measure using the weights generated through this method. The results were robust to this alternative operationalization of CSR engagement.

Third, we included other control variables in our models. At the firm level, we replaced R&D expenditures with R&D-to-sales ratio. Also, we alternatively measured unabsorbed slack by using cash equivalents (Kim & Bettis, 2014). At the country level, GDP growth was included to account for the potential association between economic growth and CSR engagement. The regression models including these variables were qualitatively similar to those initially reported.

Fourth, we tested the effect of financial performance on CSR engagement using the raw form of ROA (unadjusted by aspiration levels). The results of this analysis are presented in Table 5. As can be seen, the effect of ROA on CSR engagement is significant and positive (6.270, *p < 0.01),* This finding masks the insignificant impact of underperformance on CSR engagement in underperforming firms that was revealed in our original models and shows the value of using the aspiration-adjusted performance matrices for a more accurate prediction of CSR engagement (see the discussion section for more details).

Finally, we used different criteria for determining the outliers in our performance feedback variables. As shown in Table 4, the original models were run by dropping the upper and lower 1% of observations based on the values of the performance feedback variables. We reran the models with a 5% cutoff and also without dropping any observation. The results showed that our analysis is robust to outliers at that cutoff as well.[12]

<<INSERT TABLE 5 ABOUT HERE>>

3.5. DISCUSSION AND CONCLUSION

This study proposed and empirically tested a conceptual model to explain variations in CSR engagement triggered by relative performance as predicted by the performance feedback and institutional theory. More specifically, we framed CSR engagement as a risk-averse nonmarket strategy that is more likely to be pursued when a firm's financial performance exceeds its goals. We further proposed and tested a number of boundary conditions for this argument by incorporating the coercive or incentivizing role of the institutional context in which a firm is operating.

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[12] All tables associated with the post-hoc analyses are available upon request.

Consistent with the performance feedback theory, firms that perform at or exceed their aspiration level increasingly engage in risk-averse investments such as CSR initiatives. The decision to adopt CSR as a risk-averse nonmarket strategy, however, does not occur in a vacuum. We demonstrate that the institutional context in which the focal firm operates has a significant moderating impact on the extent of engagement in CSR. Our results show that socially supportive regulative, cognitive, and normative institutions have positive moderating effects on our primary relationship. In terms of size, the coercive dimension of regulatory institutions appears to have more pronounced impact on Overperformance-CSR engagement relationship than socially supportive cognitive and normative institutions. This result suggests that a stick (coercive mechanism) appears to be more effective than incentives (carrots) in prodding firms that overperform to engage in CSR.

Our results have several important theoretical contributions, especially for the behavioral theory of the firm research stream. First, the increasing importance of nonmarket approaches in a firm's strategy portfolio (Mellahi et al., 2016) makes it imperative for strategy scholars to include nonmarket strategies in the array of possible behaviors the ruling coalition undertakes in response to performance deviating from the aspiration level. Second, we reconceptualize firm behaviors from those driven by problemistic risk-taking search in the firm (Cyert & March, 1963) to behaviors driven by insurance-like (risk-averse) protection for social-environmental improvement, either internally and/or externally (Barreto, 2012; Iyer & Miller, 2008). Third, our study contextualizes an aspiration-driven account of CSR engagement (Wezel & Saka-Helmhout, 2006) by considering the moderating impact of institutions that can have both a coercive and incentivizing effect on the firm overperformance-CSR relationship. By adopting an interactionist view of CSR engagement, we obtain richer insights into the conditions under which

performance feedback can further reinforce CSR engagement, and what institutions have a particularly pronounced moderating impact. Additionally, we offer a methodological contribution in that we develop CSR-relevant domain-specific composite measures that are more inclusive and capture different aspects of the institutional setting; this methodology is relevant for studying CSR.

Overall, this paper also adds to one of the long-standing debates in the CSR literature: the question of whether there exists a business case for firms to engage in socially responsible behavior (e.g., Carroll & Shabana, 2010; Waddock & Graves, 1997). From an empirical perspective, this question translates into an investigation of whether CSR is an antecedent of financial performance. A very large number of empirical studies have investigated this question to the extent that a number of meta-analytical reviews (e.g., Orlitzky, Schmidt, & Rynes, 2003) have been conducted to aggregate the empirical findings of prior studies. Therefore, we know a lot about whether, how, and under what conditions CSR can influence financial performance. Surprisingly, however, we know very little about the potential impact of financial performance on CSR (Surroca, Tribó, & Waddock, 2010), and this study is among the first steps in addressing that gap in the literature. Moreover, by emphasizing the importance of the performance-aspiration gap, the results of this study may explain some of the inconsistencies in previous studies on the relationship between CSR and financial performance. Scholars in this area have mainly utilized the unadjusted and raw indicators such as ROA or return on equity as measures of financial performance to predict CSR engagement. Our post-hoc analysis revealed that such an approach could mask the true relationships between financial performance and engagement in CSR. A firm may have had a positive ROA in a year, but if this number is less than the ruling coalition's aspiration, it may not translate into more engagement in CSR.

Our study has several theoretical implications. First, it is imperative, when examining the relationship between relative financial performance and CSR engagement, to incorporate the context in the analysis. In this particular study, we selected to assess the moderating impact of the institutional context, because institutions influence resource allocation processes and patterns implemented by the top management team (North, 1990; Peng & Heath, 1996). Therefore, an important theoretical implication is that decisions in response to performance feedback are affected by both the internal (risk-taking preferences) and external environment (institutions) in which the firm operates. Future studies could further enhance the interactionist view presented here by examining additional dimensions of the institutional environment, in isolation or in combination with other attributes of the external environment (social, economic, technological).

Second, we focus on a frequently neglected issue in the behavioral theory of the firm line of research: where do firms invest when they reach and especially exceed their aspiration levels? Some studies have noted that many firms that overperform experience the "fat cat" phenomenon (Hedberg, Nystrom, & Starbuck, 1976), in that they are fully satisfied with their performance in the market environment (Cyert & March, 1963; Greve, 1998, 2008). Hence these firms are becoming inertial and risk averse (Cyert & March, 1963). Little is known about how firms behave in the overperformance spectrum. Our study suggests that overperforming firms tend to be more active in the nonmarket environment, by engaging in CSR. The implication of our findings suggests that firms that do well financially tend to configure their portfolio of strategies (market and nonmarket strategies) differently from firms that have poor financial performance. Therefore, future studies could examine the impact of performance feedback on the portfolio of strategies, comprising both market and nonmarket options. Additionally, other nonmarket

options, such as corporate political activity, could be considered as part of the portfolio of strategies.

Our findings have important managerial implications as well. This paper does not prescribe that firms that underperform should not invest in CSR activities, because they do, based on our results. These results suggest that underperforming firms do not meaningfully increase their involvement in CSR, but we did not observe that underperformance meaningfully reduces CSR engagement either. One possible explanation is that the mix and type of CSR activities is likely to change when firms move from firm underperformance to firm overperformance. For instance, in lean times, (underperforming) firms likely invest in the type of CSR activities that are mandated by law, without antagonizing shareholders by dedicating more resources to other types of CSR activities or going beyond the bare minimum stipulated by law. Once the firm overperforms, managers are in a better position to address the concerns of a much broader array of stakeholders and to invest in a wider range of CSR activities. The extent of engagement will depend on the institutional context as shown in this study. In terms of implications for policy makers, our study provides insights into what tools policy makers have at their disposal to ensure more CSR engagement by firms that are doing well financially (above their aspirations). Specifically, all labor regulations and governance quality and effectiveness have a particular impact. To a lesser extent, a free press, governmental support for NGOs, laws guaranteeing gender equality, and an educated citizenry are all areas over which policy makers have control and can make a positive impact in stimulating more and better CSR engagement by firms that are doing very well.

This study has a number of limitations. First, methodologically, while we took precaution and tested for reverse causality between performance feedback and CSR engagement, an ideal

solution would be to have an external shock that creates an exogenous variation in firms' CSR engagement. Second, we examined the influence of performance feedback on CSR engagement in the absence of information on firms' engagement in political activity—another important facet of nonmarket strategies. And third, we did not control for other significant nonmarket events that may have occurred in the countries studied in the time period considered, such as natural disasters, terrorist attacks, political/social upheaval, or wars that could affect engagement in CSR.

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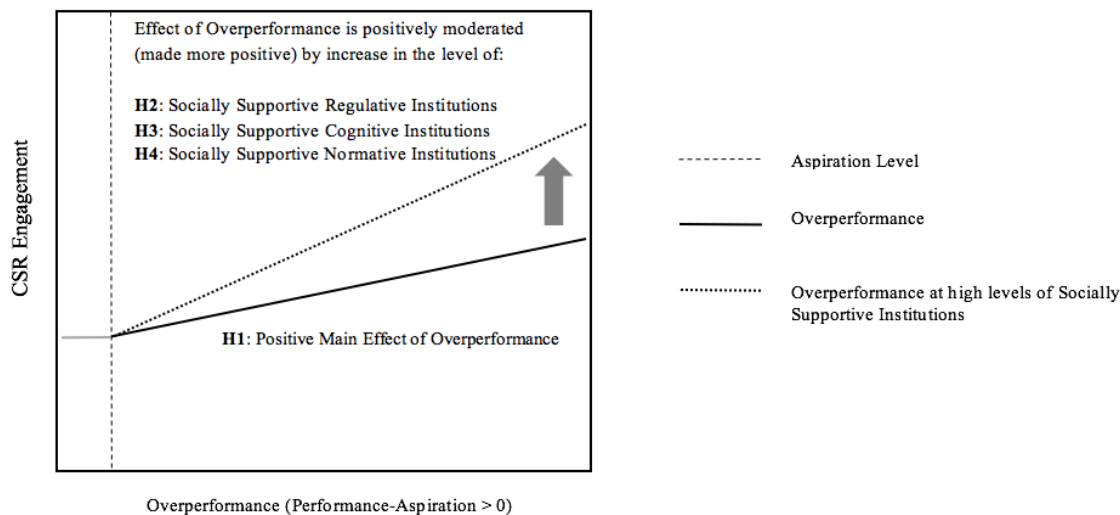
Figure 1. Hypothesized Relationships

Table 1. Average and Standard Deviation of CSR Engagement across Firms and Countries, by Year

Year	Frequency	Mean	S.D.
2004	400	56.64	29.19
2005	551	55.41	29.68
2006	576	56.97	29.44
2007	626	57.36	29.39
2008	721	59.22	29.31
2009	828	59.27	29.42
2010	903	61.41	29.28
2011	904	62.93	28.58
2012	894	63.16	28.34
2013	909	63.32	28.22
2014	895	64.27	27.80
2015	304	59.02	28.29
Total	8511	60.57	28.99

Table 2. Average and Standard Deviation of CSR Engagement Scores across Years, by Country

Country	Frequency	Mean	S.D.
Australia	339	44.79	26.18
Austria	63	71.52	22.28
Belgium	118	61.23	29.57
Brazil	133	75.41	20.90
Canada	410	47.02	27.79
Switzerland	234	61.14	27.99
Chile	30	42.86	29.55
Germany	377	73.40	24.80
Denmark	46	69.44	22.92
Spain	36	84.26	14.18
Finland	98	82.93	11.85
France	275	80.27	20.09
United Kingdom	852	68.19	22.14
Greece	72	47.12	32.33
India	21	86.22	10.45
Ireland	47	47.01	30.64
Israel	38	48.42	25.88
Italia	185	66.04	30.01
Japan	2337	58.68	30.67
South Korea	235	70.33	29.99
Mexico	68	51.86	35.79
Netherlands	99	77.64	19.65
Norway	53	71.28	21.27
New Zealand	22	47.98	22.65
Peru	7	31.36	5.90
Philippines	24	49.94	26.10
Puerto Rico	19	62.79	26.68
Sweden	180	73.28	21.05
Thailand	39	67.70	28.37
Turkey	59	62.08	24.03
USA	1895	53.20	28.59
South Africa	100	73.95	16.53
Total	8511	60.57	28.99

Table 3. Descriptive Statistics

		Mean	S.D.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	CSR Engagement	60.472	28.935	6.4	97.95	1														
2	Firm Size	15.707	1.346	11.029	19.796	0.51	1													
3	Absorbed Slack (Ln)	-1.814	0.852	-9.645	3.311	0.03	-0.04	1												
4	Unabsorbed slack (Ln)	-1.474	1.214	-9.558	4.352	-0.14	-0.31	0.07	1											
5	Potential Slack	3.728	1.473	-4.605	10.558	0.13	0.26	-0.10	-0.47	1										
6	R&D Expenditures	0.385	1.18	0	13.568	0.29	0.46	0.19	-0.02	-0.01	1									
7	GDP(Ln)	28.668	1.249	23.583	30.487	-0.08	0.14	0.13	-0.11	-0.03	0.08	1								
8	Country Infrastructure	5.738	0.619	2.534	6.65	0.01	0.03	0.11	-0.03	-0.10	0.12	0.31	1							
9	Trade per GDP	51.798	34.806	21.583	357.475	0.10	0.00	-0.07	-0.06	0.05	-0.01	-0.72	-0.08	1						
10	Shareholders' Rights	3.836	1.307	0	5	-0.14	-0.15	-0.04	0.01	-0.07	-0.05	0.5	0.15	-0.6	1					
11	Underperformance	-0.015	0.032	-0.218	0	0.03	0.08	0.02	-0.05	-0.04	0.00	0.04	0.02	-0.04	-0.02	1				
12	Overperformance	0.014	0.029	0	0.227	-0.06	-0.13	-0.01	0.12	-0.08	0.00	-0.02	0.01	0.00	0.05	0.22	1			
13	S.S Regulative Institutions	-0.012	0.372	-1.206	1.225	0.19	0.01	-0.04	-0.07	0.03	0.05	-0.56	0.33	0.58	-0.43	-0.04	0.02	1		
14	S.S Cognitive Institutions	-0.144	0.949	-2.994	1.496	-0.02	-0.02	0.11	-0.31	0.08	0.05	0.12	0.13	0.13	0.22	-0.04	0.08	0.08	1	
15	S.S Normative Institutions	-0.059	0.694	-2.7	1.044	0.07	-0.01	-0.05	-0.20	0.15	-0.01	-0.31	-0.14	0.42	-0.18	-0.09	0.08	0.42	0.54	1

N=8,511

Table 4. Results of GEE Regression Analysis

VARIABLES	Model1	Model2	Model3	Model4	Model5
Firm Size	7.425***	7.522***	7.584***	7.503***	7.529***
	(0.449)	(0.446)	(0.442)	(0.448)	(0.446)
Absorbed Slack	0.919***	0.972***	0.961***	0.972***	0.964***
	(0.339)	(0.342)	(0.343)	(0.342)	(0.342)
Unabsorbed Slack	-0.181	-0.198	-0.168	-0.212	-0.201
	(0.215)	(0.216)	(0.216)	(0.216)	(0.216)
Potential Slack	-0.307*	-0.280	-0.282	-0.273	-0.278
	(0.177)	(0.180)	(0.180)	(0.180)	(0.180)
R&D	0.629	0.601	0.590	0.610	0.597
	(0.545)	(0.544)	(0.531)	(0.550)	(0.542)
GDP	-3.423***	-3.441***	-2.423***	-3.365***	-3.425***
	(0.729)	(0.728)	(0.770)	(0.744)	(0.729)
Country Infrastructure	0.282	0.312	-0.974	0.328	0.279
	(0.678)	(0.678)	(0.752)	(0.678)	(0.681)
Trade per GDP	0.0355	0.0358	0.0342	0.0390	0.0376
	(0.0282)	(0.0282)	(0.0278)	(0.0293)	(0.0289)
Shareholders' Rights	-0.206	-0.189	0.117	-0.114	-0.179
	(0.662)	(0.661)	(0.659)	(0.684)	(0.659)
Underperformance		-2.174	-1.976	-2.005	-2.197
		(3.257)	(3.276)	(3.270)	(3.253)
Overperformance		8.260***	7.717**	7.725**	7.014**
		(3.523)	(3.508)	(3.602)	(3.587)
Socially Supportive Regulative Institutions			5.604***		
			(1.618)		
Socially Supportive Regulative Institutions * Overperformance			13.13**		
			(7.403)		
Socially Supportive Cognitive Institutions				-0.416	
				(0.721)	
Socially Supportive Cognitive Institutions * Overperformance				5.034*	
				(3.392)	
Socially Supportive Normative Institutions					-0.249
					(1.165)
Socially Supportive Normative Institutions * Overperformance					7.720*
					(5.575)
Observations	8,511	8,511	8,511	8,511	8,511
Number of Firms	1,107	1,107	1,107	1,107	1,107

* $p < 0.1$; ** $p < 0.05$, *** $p < 0.01$ on one-tailed test

Robust standard errors in parentheses. One-tailed p-values for hypothesized variables, two-tailed p-values for control variables. Hypothesized main effects are winsorized (1%). Year and industry dummies are included in all models but omitted from the table to improve readability.

Table 5. Results of GEE Regression Analysis (Using ROA as the Measure of Performance)

VARIABLES	Model1	Model2
Firm Size	7.425***	7.394***
	(0.449)	(0.449)
Absorbed Slack	0.919***	1.038***
	(0.339)	(0.342)
Unabsorbed Slack	-0.181	-0.189
	(0.215)	(0.214)
Potential Slack	-0.307*	-0.190
	(0.177)	(0.180)
R&D	0.629	0.654
	(0.545)	(0.527)
GDP	-3.423***	-3.421***
	(0.729)	(0.729)
Country Infrastructure	0.282	0.331
	(0.678)	(0.677)
Trade per GDP	0.0355	0.0358
	(0.0282)	(0.0283)
Shareholders' Rights	-0.206	-0.198
	(0.662)	(0.661)
ROA		6.270***
		(2.413)
Observations	8,511	8,511
Number of Firms	1,107	1,107

* $p < 0.1$; ** $p < 0.05$, *** $p < 0.01$ on one-tailed test

Robust standard errors in parentheses. One-tailed p-values for hypothesized variables, two-tailed p-values for control variables. Hypothesized main effects are winsorized (1%). Year and industry dummies are included in all models but omitted from the table to improve readability.
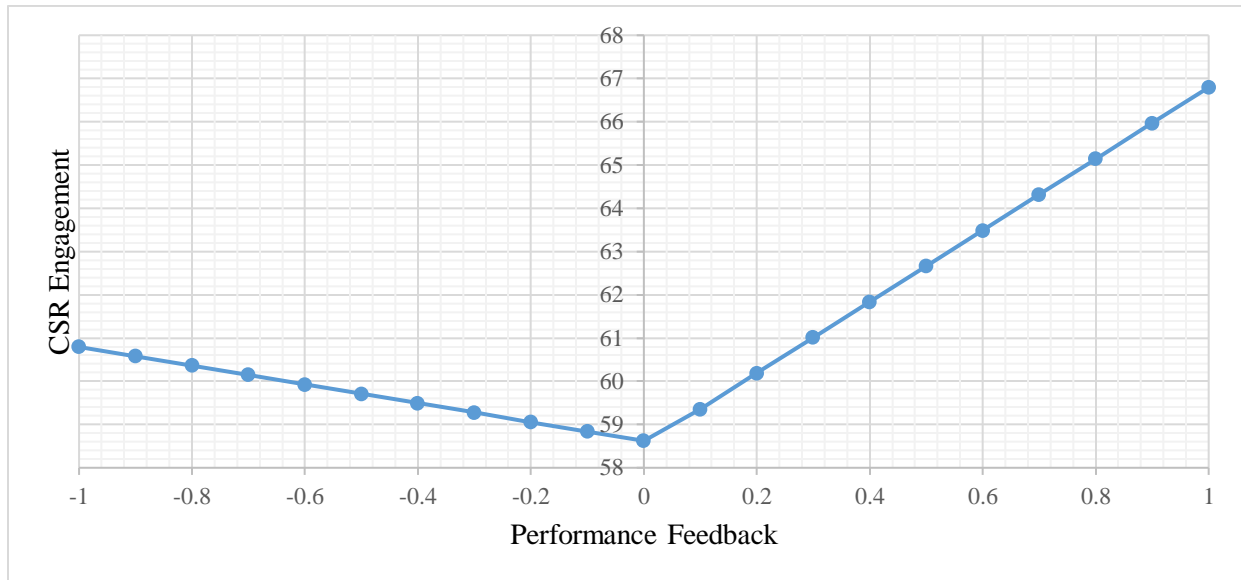
Figure 2. Relationship between Performance Feedback and Level of CSR Engagement