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Exploring Cross-Border Business Model Adaptation

Kurt Norder

EXPLORING CROSS-BORDER BUSINESS MODEL ADAPTATION

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Kurt Norder

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Accepted by:

Dr. Tatiana Kostova, Co-Director of Dissertation

Dr. Kendall Roth, Co-Director of Dissertation

Dr. Gerald McDermott, Committee Member

Dr. David Crockett, Committee Member

Dr. Lacy K. Ford, Vice Provost and Dean of Graduate Studies

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ABSTRACT

A business model is defined as the way a firm organizes its available resources to deliver and capture value. It can be simplified using the RCOV framework which splits the model into resources and competences, organization, and value propositions. However, the interactive nature of the components still creates internal complexity that must be managed without undermining the competitive advantage. This internal system is also subject to a multiplicity of contextual pressures, particularly as it crosses national borders. A cross-border business model has at least one of its components in multiple country environments, thus it faces variation in economic, competitive, technological, political, social, and institutional demands. This dissertation explores how the multiple external demands impact the business model and generate different adaptive responses. An inductive case study which focuses on a single business model within a multinational corporation in the aviation engine services industry provides several embedded cases of business model adaptation (BMA) relative to the base model. These examples serve as the basis for developing three new theoretical insights on business model adaptation. First, a two-by-two typology of business model adaptation demonstrates how the internal system is changed in response to the multiplicity of demands. The degree of integration (low or high) and the nature of the response (reduce or expand) are considered. Second, variation in the external pressures

is classified into a typology of effects from the set of multiple demands on the base model. Many times the type of external pressures, i.e. economic or institutional, are assumed to be competing or conflicting, however, the external demands may be congruent, conflicting, orthogonal, neutral, or some combination of these forces. It is critical to consider them together relative to the base model despite the type or source. The final contribution integrates these two typologies to form a related typological theory which integrates the BMA responses with different combinations of external effects. Propositions are suggested relating the types of adaptive responses to the nature of the external demands relative to the base model.

Key Words: Business Model, Adaptation, Multiple Demands, Congruence

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CHAPTER 1

INTRODUCTION

Multinational corporations (MNCs) must have a competitive advantage to succeed abroad and overcome the liability of foreignness (Hymer, 1968; Zaheer, 1995). However, additional changes or adaptation may be required to survive (Hannan and Freeman, 1977, 1984) or to capture optimal 'long term economic returns' (Samiee and Roth, 1992; Dow, 2006). In a world of multiple economic, social, institutional, and political pressures (Ghemawat, 2007; Kostova, Roth, and Dacin, 2008; Westney, 2005), managers face serious challenges related to the adaptation of their multi-faceted business models to multiple and sometimes incongruent demands. Cross-border business models in particular face numerous demands from multiple sources, thus going abroad can be costly and doing so without truly understanding how the business model is affected by the multiple demands can be financially devastating.

Gupta and Govindarajan (2004: 47) note, 'To establish local presence, a company must first understand the uniqueness of the local market so as to decide which aspects of its business model require little change, which require local adaptation, and which need to be wholly reinvented.' However, Dow (2006) found that there is a tendency to under-adapt. Wal-Mart experienced this when 'the Bentonville, Ark.-based behemoth sold its stores in South Korea and Germany (incurring a $1 billion loss in Germany

alone), reportedly due to its inability to adapt to the local cultures and unseat established players' (Wailgum, 2007).

On the other hand, over-adaptation can undermine the business model and the related value which it creates or captures. For example, the restaurant chain, TGI Friday's, localized their menu in South Korea where the customers were seeking an American experience from the foreign firm (Gupta and Govindarajan, 2004: 58). 'Preemptive adaptation' can also have a negative effect on knowledge transfer networks within the MNC because they limit the interactive nature and common ground that supports transfer (Szulanski and Jensen, 2006). If the over-adaptation affects the source of the competitive advantage that enables the MNC to overcome the liability of foreignness (Zaheer, 1995), strong selection forces may accrue (Hannan and Freeman, 1977).

The global strategy and MNC literatures offer several insights into how to manage the many conflicting pressures on business models. The work on integration and responsiveness (IR) suggests that overcoming the liability of foreignness requires a careful balancing of globally integrated standardization and locally responsive adaptation (Bartlett and Ghoshal, 1989; Prahalad and Doz, 1987). Much of the globalization versus localization debate either focused on whether to adapt at all, or considered only pieces of the business model such as products (Levitt, 1983), the mix of marketing options (Samiee and Roth, 1992), or integrated organizational approaches (Bartlett and Ghoshal, 1989; Prahalad and Doz, 1987; Gupta and Govindarajan, 2004). Westney (2005) discussed the variety of localization perspectives related to the choice

of MNC value offering, resources, and organization and suggested there is no linkage between them. Thus the existing literature has not addressed business model adaptation from a systemic point of view.

Furthermore, in discussing the limitations of the concept of 'Think global, act local', Ghemawat (2007: 30) suggested,

> 'The problem is that these extremes do not so much span a strategy continuum as constitute two singularities in which cross-border complexities can be finessed and simple single-country approaches applied. … [T]he intermediate levels of cross-border integration inherent in semiglobalization are what open up, over a very broad domain, the possibility of global strategy having content distinct from single-country strategy. … Semiglobalization is what enables the development of a distinctively global approach to strategy.'

The multi-faceted, semiglobalized environments faced by cross-border business models suggest the need to delve deeper into how the system which forms the business model responds to multiple and complex demands.

Although the MNC and global strategy literature offer many insights into the management of the MNC, it does not take into account the many variations which occur within the MNC while still maintaining the systemic connections. Most work suggests a single diverse, yet highly integrated organization. Whitley (2010) suggests that such an MNC is relatively unlikely due to institutional differences and authority sharing across borders. Also, Roth's (1992) work on configurations of MNCs in global industries showed multiple global organizational paths to high performance which implies variation in the business model response across borders. The MNC level suggests responsiveness across borders yet neglects differences in demands as well as the potential for differences in responses based on the internal system of components.

The business model literature has not considered adaptive response except implicitly as part of the business model innovation (BMI) or business model evolution (BME). The focus in this work has been on internal characteristics requiring innovation or the list of tactical levers and actions that need to take place without examining the implications for the rest of the business model. With the exception of Santos, Spector, and Van Der Heyden (2009) who identify types of organizational BMI activities, the work on BMI tends to describe the organizational characteristics which support such innovation rather than discussing the types of BMI. For example, learning and discovery through experimentation are imperative for innovation and evolution due to the complexity of the business model and its environment (Demil and Lecocq, 2010; McGrath, 2010; Sosna, Trevinyo-Rodriguez, and Velamuri, 2010; Svejenova, Planellas, and Vives, 2010; Teece, 2010). Yet the types of BMA are still unclear despite multiple actions (Santos et al., 2009) and levers (Ghemawat, 2007) offered to tactically respond. Demil and Lecocq (2010) focus on the concept of maintaining 'dynamic consistency' to continually improve internal fit during evolution, but this view does not explain the adaptations and neglects the persistence of incongruence in the environment that limits integration.

Despite the importance of adaptation and the rather extensive literature on that topic, little has been done regarding the adaptation of the business model system. The business model is a system of interconnected resources organized to deliver and capture value (Demil and Lecocq, 2010). Resources, practices, structure, and products are all connected together to create a competitive advantage. The interaction of the

components suggests that a change in one part may require changes in others as a secondary response. Taking the view of the business model as a whole highlights the need to understand the internal systemic connections that managers must account for when making strategic decisions. The research question addressed in this dissertation is how the business model as a system strategically responds to multiple environmental demands.

While the business model is itself a set of interactive components, the environment also has many facets which create multiple demands and conditions. The environmental influences are multifaceted including technical, industry-competitive, and institutional dimensions. These different demands can align to influence the business model for similar strategies or drive it in new or opposing directions. The task environment represents important elements that affect goal setting such as consumer demands, technology, and industry-competitive forces (Thompson, 1967). Demands are typically constrained by the type of technology available to deliver the value proposition and the ability to alter its existing development path and related infrastructure. Multiple demands also reflect the industry competitive structure as Porter (1980) discussed with his five forces model. In addition, institutions can influence the cross-border business model at multiple levels (Kostova, Roth, and Dacin, 2008) and through various mechanisms (DiMaggio and Powell, 1983; North, 1990; Scott, 1995). Governments and other influential stakeholders can influence the institutions as well. All of these demands and conditions simultaneously influence the business model and need to be considered together.

As the business model is subjected to several demands, opportunities and conflicts may arise. Managers need to understand how to sustain their competitive advantage while managing multiple demands and conditions. Also, they need to consider the secondary implications of making a change in the business model system. This dissertation explores the interaction of multiple demands on an internal system of components to better understand the strategic response of business model adaptation, i.e. the changes in the business model.

The lack of research which combines all of the aspects of the business model together in relation to adaptation can perhaps be explained by the incredible theoretical and methodological complexity of the construct. To access the breadth and depth of the interconnections within the business model as it is subjected to multiple demands, a qualitative, inductive case study (Eisenhardt, 1989; Yin, 2009) was used. A single business model in the aircraft engine services industry was used to control for firm and industry variation. This context was also viewed theoretically appropriate because it provides a conservative test for business model adaptation. Given the global nature of the technology, industry structure, and institutional standardization in this case, adaptation here is unlikely.

In discussing the use of global scale as a strategy, Ghoshal (1987: 426) noted, 'For some industries, such as aeroframes or aeroengines, the economies of scale may be large enough to make the need for global integration of activities obvious.' This suggests that the industry characteristics for aeroengines should not show variation across national borders. However, several examples of incongruent demands arose

from the case which highlighted various adaptive responses and connected changes that rippled through the business model. From these illustrations, three main contributions were generated. First, patterns were identified which led to a typology of adaptive business model responses to multiplicity of demands. Second, the impact of the many pressures and conditions relative to the focal business model were simplified into a typology of congruence. Finally, the two typologies were combined to demonstrate a causal model for each strategic adaptive response.

Overview of the Dissertation

This dissertation is organized as follows. A review of the literature which informed the work is introduced in Chapter 2 to help theoretically ground the study. The related concepts of the business model, the MNC and the environment, and adaptation are discussed. In Chapter 3, the research design is presented. An inductive case study methodology is used to develop theoretical insights into the interaction between the internal business model system with the external multiplicity of pressures and conditions. The first part of the results from the inductive inquiry is given in Chapter 4 as Aero's base service business model and supporting demands and conditions are described. Much of the business and institutional facets of the environment generate supporting pressures for the centralized, standardized global model. Chapter 5 then delves into seven patterns of strategic adaptive response where Aero's base model faced multiple incongruent pressures. In Chapter 6, cross-case analysis of the seven cases yielded a typology of business model adaptation, a typology of external congruence relative to the base model, and a causal framework with associated

propositions. Finally, in Chapter 7, theoretical and practical contributions are illuminated before concluding remarks, limitations, and future opportunities are suggested.

CHAPTER 2

THEORETICAL BACKGROUND

In this chapter, I will bring together three main streams of literature on the business model, the MNC and the environment, and adaptation. The business model concept is clarified and defined before the R/COV framework is introduced for simplification. Work on the MNC is reviewed to explore the multifaceted, cross-border context of the business model. The final section of this chapter explains the implications of the environment for adaptation.

Business Model

The business model concept can be applied at multiple levels. Baden-Fuller and Morgan (2010: 159) conceptualize business models as somewhere 'in-between' firm-specific idiosyncratic and macro theoretically identical, i.e. maximizing or isomorphic legitimacy-seeking. Similarly, Santos, Spector, and Van Der Heyden (2009) explain that a business model is not firm specific. However, Demil and Lecocq (2010) note the business model can represent an 'abstract and conceptual level …that can be applied across multiple sectors', 'real world instances' comparing a model across firms, and the 'individual level' where 'the BM lens helps us analyse the functioning and architecture of a specific organization' (p. 231). I follow the latter view of Demil and Lecocq (2010) to see a single, intra-firm level model across environments. This does not necessarily assume that the model does or does not share elements across firms, but rather

examines the environmental effects on a single firm's business model. I also take it a step deeper in that there may be multiple business models within the same firm. Here I focus on a single offering such as a product or a service and the related delivery of that value proposition. A cross-border business model within an MNC is optimal for my analysis because it allows me to look at a single business model across several international environments while still integrated within the same firm (Roth and Kostova, 2003).

Business Model Definition

The business model concept is associated with extensive theoretical and empirical complexity and is relatively underdeveloped. There has been a ubiquitous proliferation of usage of the term 'business model', particularly by practitioners since the Internet Bubble with relatively little academic development (Magretta, 2002; Chesbrough and Rosenbloom, 2002; Lecocq, Demil, and Warnier, 2006). In 2001, Porter (p. 73) downplayed the concept of the business model due to its lack of definitional clarity saying it 'is murky at best'. A recent sociological study helped to clarify the usage and implied meaning of the term by finding that there are both 'global' meanings and 'local' interpretations depending on the community using the term (Ghaziani and Ventresca, 2005). They found that, 'Value Creation', which was a common, overarching 'global' frame, 'includes the idea elements of transaction content, governance, and structure, among others (see Amit and Zott, 2001; Chesbrough and Rosenbloom, 2002)' (p. 535). Other 'local' interpretations such as 'Revenue Model' or 'Business Strategy' explains

why most academic works on business models use their own definition of the business model which are not universally embraced. How a firm creates value is definitely at the core of the term 'business model', but putting the complex interaction between many facets of a business into a consistent, parsimonious definition has proven difficult.

Despite this lack of clarity, the multi-component construct offers great potential for understanding strategic action. Building on the global 'value creation' theme and several other themes from across the business model literature (see Table 1[1]), I am proposing the following definition by slightly adapting that of Casadesus-Masanell and Ricart (2010). I define business models as the logic of a firm and the way it organizes its available resources and competences into activities to create value for its stakeholders.

[1] Many of the definitions in Table 1 come from Baden-Fuller and Morgan's (2010) article discussing the different ways business models act as models.

Table 2.1
Definitions of the Business Model

Authors (Year)	Definition	Year	Publication
Amit & Zott (2001)	The structure, content, and governance of transactions designed so as to create value through the exploitation of business opportunities	2001	Strategic Management Journal
Magretta (2002)	Stories that explain how enterprises work	2002	Harvard Business Review
Chesbrough & Rosenbloom (2002); Chesbrough (2010)	Fulfills the functions of articulating the value propositions, identifies the market segment, defines the structure of the value chain, details the revenue mechanism, estimates the cost structure, positions the firm in the value network, and formulates competitive strategy	2002	Industrial and Corporate Change
Johnson et al (2008)	Four key elements: customer value proposition, profit formula, key resources, and key processes	2008	Harvard Business Review
Teece (2010)	How a firm delivers value to customers and converts payments into profits	2010	Long Range Planning
Zott & Amit (2010)	A system of interdependent activities that transcends the focal firm and spans its boundaries	2010	Long Range Planning
Demil & Lecocq (2010)	The way activities and resources are used to ensure sustainability and growth	2010	Long Range Planning
Itami & Noshino (2010)	A profit model, a business delivery system and a learning system	2010	Long Range Planning
Yunus et al (2010)	A value system plus a value constellation	2010	Long Range Planning
Sabatier et al (2010)	Cross roads of competence and consumer needs	2010	Long Range Planning
Casadesus-Masanell & Ricart (2010)	The logic of the firm, the way it operates and how it creates value for its stakeholder	2010	Long Range Planning

The 'logic of the firm' implies the reasoning for why the organization exists and the way decisions are made. Tikkanen, Lamberg, Parvinen, and Kallunki (2005) elaborate on the interconnections of the managerial belief systems with the material aspects of the business model. The actions and decisions of the managers will be biased by the rule system that shapes their hierarchy of beliefs. The idea of organizing the 'available'

resources and competences extends beyond the firm boundaries to capture the concept of the value chain. The part of the definition 'create value for its stakeholders' describes both the value creation and value capture for the firm but also for the recipients of its products or services, customers, supplier partners, organizational owners, organizational employees, and anyone connected to the results or the process. Value proposition is the manifestation of the product market strategy that creates value for the stakeholders. The value for the owners typically comes in the form of profits, but this definition is more generalizable to any organization that may also see value in social or environmental benefits. Value for the owners may also mean growth or innovation and for the employees may be economic reward or job security through sustainability of their employer.

Building on this definition, a cross-border business model is a business model where at least one part occurs across national boundaries. For example, resources may be purchased from a foreign supplier or subsidiary, the products may be exported, or investors may be in another country. Cross-border business models may have as little as one aspect across borders or most of every component that spans national borders.

Business Model Framework

I build on the work of Lecocq, Demil, and Warnier (2006) and Demil and Lecocq (2010) as an attempt to simplify and give structure to the complex business model construct. I use the so called R/COV framework which considers the business model as a system of interactive components: resources and competences (R/C), internal and

external organization (O), and a value proposition (V). They do not distinguish between internal and external resources, but they do assume the competences are knowledge developed internally by the managers to 'improve, recombine or change the services their resources can offer' (p. 231). Certain competences can also be captured from outside the firm as well as developed internally. The organization includes the firm's 'value chain of activities…and its value network' which would tie to the above definition adopted in terms of activities across firm borders and the impact of, and on, stakeholders. The value proposition is embedded in the products and services offered by the firm, but it is possible to offer value beyond just the customer to other stakeholders similar to what Yunus, Moingeon, and Lehmann-Ortega (2010) called the 'value constellation'.

Gupta and Govindarajan (2004: 151) describe the business model as a 'self-reinforcing and internally consistent' system of three arenas: value creation system, value, and customers. They note that 'dramatic' changes need to occur to 'redefine the rules of the game' yet the three segments need to align. This is very similar to the configurations approach (Miller and Friesen, 1984) which explores organizational patterns that exist within an environment such that there is little variation within a type and significant variation between them. 'When one internally consistent business model is converted into another internally consistent business model, the rules of the game are changed' (Gupta and Govindarajan, 2004: 153). This neglects the other various stakeholders in the value constellation (Yunus et al., 2010) which may have considerable influence on the business model as well as the potential for sustained

incongruence between the relative demands which limit the transition from one consistent form to another.

Companies which do business internationally need to rethink their business models. New contexts have different transaction and transformation cost structures (Ghemawat, 2007; North, 1990; Scott, 1995), which in turn require a different combination of Resources/Capabilities, Organization, and Value Propositions to optimize performance. We refer to this as business model adaptation (BMA). Teece (2010, p. 174) notes, ' [a] good business model yields value propositions that are compelling to customers, achieves advantageous cost and risk structures, and enables significant value capture by the business that generates and delivers products and services.' Different environments will change what is valued by customers and various stakeholders as well as the available cost and risk reduction options. Similar to a strategic practice that may need to be adapted to be accepted and utilized in a new location (Kostova, 1999; Kostova and Roth, 2002), aspects of the business model may need to be adapted as well.

MNCs and the Environment

Extending the conceptualization of the business model across borders adds further constraints and draws on the literature relating to the multinational corporation (MNC). As suggested, MNCs exist primarily because of inefficient markets (Hymer, 1968). In order to be successful abroad, the MNC must have a competitive advantage to overcome inefficiencies driven by the liability of foreignness (Buckley and Casson, 1976; Caves, 1982; Dunning, 1977; Hennart, 1982; Hymer, 1968; Zaheer, 1995). If the firm

competitive advantage was the only aspect, then standardization would make sense and you would see exporting or 'replication as strategy' (Winter and Szulanski, 2001) where foreign direct investment (FDI) appears in the form of horizontal integration across the value chain with little or no adaptation (Kogut, 1985).

However, there has been extensive debate between standardization/globalization versus adaptation/localization. The debate has argued between globalization for scale economies (Levitt, 1983) and localization for cultural responsiveness (Douglas and Wind, 1987). The arguments tended to be whether to adapt or not to adapt and were typically aimed at only part of the business model such as the product (Levitt, 1983) or varying degrees of the marketing mix (Samiee and Roth, 1992; Solberg, 2000, 2002). Extending to the organization as well, Integration-Responsiveness (IR) models suggest that focus should be on both standardization and adaptation in the form of the Multi-focal firm (Prahalad and Doz, 1987) or the Transnational Solution (Bartlett and Ghoshal, 1989). Bartlett and Ghoshal (1988) suggest that the MNC must develop organizational capabilities to balance between standardization and localization by building on the 'company's heritage' and developing the ability to 'think globally and act locally.' However, in contrast to the simplistic mantra of 'think globally, act locally', Ghemawat (2007) argues that global standardization and local adaption are two extreme points in a multi-dimensional, 'semiglobalized' field of pressures. Thus, global strategy must go beyond just a debate of globalization or localization.

Even the meaning of localization is subject to the focal point of analysis. Westney (2005: 58) notes,

> ''Localization' can mean adding more value locally (what gets done), using local rather than expatriate or third-country managers (who does it), or adopting local rather than parent company organizational patterns (how it gets done). There is no clear logical linkage among these three facets of localization, but the assumption is often made that the more value the subsidiary adds locally and the more dominant local managers are in the organization, the more likely the subsidiary is to adopt local rather than parent company patterns (see for example Rosenzweig and Singh 1991).'

Putting this in the context of the business model, the first suggests adapting the value proposition, the second - the resources and competences, and the third - the organization. Westney's (2005: p. 58) suggestion that 'there is no clear logical linkage among these three facets of localization' may be correct from the view she is taking across business models and firms. The pieces that are influenced and get adapted are not necessarily the same for all business models or MNCs, however, if you take the lens of a single business model, there are linkages between the elements that form the overall business model. Understanding the connections between the business model components will help to draw more clarity to the question of adaptive business model responses to multiple demands while maintaining a competitive advantage to overcome the liability of foreignness.

Sources of Demands in the Environment

Most conceptualizations of business model innovation (BMI) and business model evolution (BME) focus mainly on the environment as a single variable that must be matched. However, business models are subject to multiple external influences, particularly across borders. Even when noting several sources of environmental

pressures that lead to change, a single environment is still implied. A single environment becomes one of perspective. In the most basic form, the business model has a single environment which is outside of the model. Within that basic form exists multiple aspects of the environment with multiple sub-types or forms. Each of these types and sub-types generate demands and conditions for the business model.

The literature on BMI and BME offers several sources of environmental pressures for change to the business model such as consumer demands, new technology, industry and competition, and institutions. Johnson et al. (2008: 57) suggested undertaking BMI when there is a large group of unserved consumers, a new technology to capitalize upon, potential for redefining value delivery, low-end competitive pressures, or a changing market demands or factor costs. The literature on adaptation also suggests that adaptation will occur under conditions of uncertainty in the task environment (Thompson, 1967) or diversity in the technological environment. At the same time, multiplicity of institutional demands is suggested to reduce the potential for adaptation and increase the likelihood for more resistive responses (Oliver, 1991).

Demil and Lecocq (2010: 236) note, 'External factors refer to constraints occasioned by environmental changes, or to external 'jolts' which may disrupt the organization's usual functioning more abruptly.' Existing environments may change or managers may be faced with the decision to change their environment based on new entry. Both cases demonstrate environmental change. However, Demil and Lecocq (2010) and others consider the environment as a single construct and implicitly suggest that the business model will only need to change when the environment changes or greater awareness of

internal opportunities occurs. Multiplicity of demands, particularly if they are persistent, may also lead to various implications for BMA. Demil and Lecocq (2010: 237) explain how the environment affects the business model,

> 'From an analytical point of view, our RCOV framework suggests that the environment has the potential to influence each of the three core BM components: affecting the cost, value or availability of resources and competences; changing the characteristics of the value network or the value chain; or modifying the value of the products and services proposed. Each of these evolutions in the environment may have macro-economic or macro-sociologic origins, but may also stem from the behavior of competitors or complementors.'

The literature thus identifies multiple sources of environmental pressures such as task, technical, industry competitive, and institutional. Much of the existing literature considers one set of these demands or compares two types (i.e. Kraatz and Zajac, 1996); however, none consider all these types 'in totality' (as Seo and Creed, 2002, suggests for institutional demands). Porter's (1980) five forces must be combined with the technological constraints and opportunities as well as the multi-level institutional conditions (Djelic and Quack, 2003; Kostova et al., 2008; Westney, 2005). Understanding how multiple environmental aspects and types affect the business model is crucial to understanding the adaptive business model response.

Some works suggest preference of one factor over another, while others compare several influences. For example, Kraatz and Zajac (1996) completed a comparative test to demonstrate the sources of adaptation (or lack thereof). They leveraged a context characterized as highly institutionalized to show that proactive contingent adaptation is likely in response to environmental changes and resource dependence despite organizational and normative institutional pressures to resist change. However, it can

be argued that overarching cultural and institutional changes influence variation in the task, technical, and competitive environments, particularly across national borders. With this in mind, multiple sources of demands are considered here regardless of whether they stem from the business environment, i.e. task, technical, and competitive, or from the multi-level institutional context. The next section discusses the literature relating to these specific environmental factors.

Business Environment. The structure of the industry and the technological constraints provide strong influences on the business model. Porter's (1980) work analyzes the industry structure and its effects on firm strategy and structure. He gives the following definition (1980, p. 275), 'A global industry is one in which the strategic positions of competitors in major geographic or national markets are fundamentally affected by their overall global positions.' He goes on (p. 275), 'Global industries require a firm to compete on a worldwide, coordinated basis or face strategic disadvantages.' Major flows of exports will be a good sign of global competition as well. Porter uses his 5-forces model to show that locational comparative advantages and various economies of scale that exceed national limits including global brand with product differentiation, extensive R&D for proprietary product technology, and centralization of talent or assets that are mobile, all facilitate global competition. Most of the barriers to global competition noted by Porter (1980) are economic or technological. For example, he notes the following impediments (Porter, 1980: 227-9): high transportation-related costs, differing product needs, established distribution channels, sales force, local

repair, sensitivity to lead times, complex segmentation within geographical markets, lack of world demand, differing market tasks, intensive local services, rapidly changing technology, governmental impediments, and perpetual resource impediments. Porter (1980) also notes the potential for government intervention for such reasons as protecting jobs.

Institutional Context. Many scholars have argued that institutions matter, but how they matter is still under question (Eden, 2010; Henisz and Swaminathan 2008). This section first introduces institutional theory and then discusses recent work regarding conflicting institutional demands. Scott (1995: 33) defines institutions as follows, 'Institutions consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior.' They can be seen as 'patterns of human activity by which individuals and organizations produce and reproduce their material substance and organize time and space' (Friedland and Alford, 1991: 243) and thus create meaning and value for means-ends combinations. Much of Institutional theory has been based on social pressures for the appearance of organizational isomorphism (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Scott, 1995). Conformity with the structures that have acquired social meaning generates legitimacy which mediates the access to strategic resources needed for organizational survival (Meyer and Rowan, 1977; Zucker, 1977; DiMaggio and Powell, 1983). It generates value and appropriateness for certain myths and ceremonies.

An organization may experience pressure from multiple institutions (Friedland and Alford, 1991; Kraatz and Block, 2008) particularly when it operates across national borders (Kostova and Zaheer, 1999; Kostova, Roth, and Dacin, 2008; Westney, 2005). Multiplicity of institutional demands may also generate conflicts (Friedland and Alford, 1991; Kraatz and Block, 2008; Pache and Santos, 2010) whether they are internal (Meyer and Rowan, 1977; Pache and Santos, 2010) or between external demands that lead to organizational heterogeneity (Greenwood et al., 2009; Greenwood and Hinings, 1996; Lounsbury, 2007; Marquis and Lounsbury, 2007; Purdy and Gray, 2009), or both (Souitaris, Zerbinati, and Liu, 2012). Competing demands challenge, and at the same time enable, organizations to choose how they will respond strategically (Clemens and Cook, 1999; Dorado, 2005; Friedland and Alford, 1991; Pache and Santos, 2010; Seo and Creed, 2002; Whittington, 1992). In this dissertation, I adapt Pache and Santos (2010: 457) definition of conflicting institutional demands, 'antagonisms in the organizational arrangements required by institutional referents' to a more general consideration of the business model and the environmental sources of demands. Conflicting demands on the business model are thus antagonisms for the systemic components of the business model that stem from external sources (technical, competitive, or institutional).

In addition to these sources of conflicting demands, cross-border business models are embedded across multi-level institutional environments (Kostova et al., 2008). The business model itself also constitutes a socially constructed institutional environment that forms the logic of the firm used to organize resources and competences to deliver and capture value. Recent work by Henisz and Swaminathan (2008: 539) also cited by

Eden (2010: 175) has called for a better understanding of how institutions matter in IB research, 'The institutional environment is not a parameter but a rich constellation of interdependent structures and systems within a country, across dyadic pairs of countries and at the level of the international state system.' Similarly, Djelic and Quack (2003: 3) suggest that 'we also have to look at the ways in which national and transnational organizations, structures, norms or rules conflict, converge or interact leading to partial hybridization.' Their focus on external political institutions at the national and international levels is one step toward understanding the implications of the various levels and institutional interactions.

Westney (2005) also notes that MNCs are influenced by different levels of institutional pressures. Industry, or inter-firm relations, is just one level of institutional influence, particularly in the MNC where the firms may be interacting at a level beyond national borders. She suggests that the levels of internal organization, industry, and external environment each must be considered for the effects of the institutional environment, especially for the MNC where the organizational field may itself cross national borders. The complexity of social pressures and actor agency resulting from embeddedness in multiple institutional environments is compounded in MNCs (Kostova et al., 2008: 997) and highlighted in the case of cross-border business models. For the MNC which operates across nation-state boundaries, the 'totality of relevant actors' that form the 'field' (DiMaggio and Powell, 1983: 65) encompasses multiple levels from different national environments to the transnational environment (Djelic and Quack, 2003). MNCs represent a 'cross-border condition, which results in diverse,

nonmonolithic, fragmented, and possibly conflicting sets of external environments' (Kostova et al., 2008: 997). Kostova et al. (2008: 998) also argue that, 'In the MNC, fields (in a neoinstitutional sense) are ill-defined or nonexistent. At the meso level, fields are multiple, fragmented, ambiguous, and inconsistent. However, at the meta level, MNCs are part of an emerging global class of organizations that share a set of values and patterns (albeit limited in scope). MNCs also form their own intraorganizational field, which serves as an 'institutional environment' for their subunits.' This 'cross-border condition' is a critical piece of the puzzle to understand how multiple institutional and economic pressures affects the types of responses within the business model system.

The cross-border business model is nested in a hierarchy of levels of institutional influences which can be simplified into transnational, national, inter-firm, and intra-firm levels. Each of these levels may have multiple institutional demands that influence the business model directly or indirectly through an interaction with other institutions. Regardless of the level, each creates a demand on the business model which requires a response. Since the focus here is on how the business model responds to multiple demands and not specifically on the types or sources of the demands, these levels are used simply to help summarize the institutional demands on the business model and to identify possible conflicts.

Seo and Creed (2002) consider all institutional demands 'in totality' since the greater context of demands potentially create conflicts which enable political agency, i.e. praxis, to lead to new institutions. I take a similar approach to consider all of the demands placed on the cross-border business model together to identify sources of

environmental influence that must be managed. A single institutional demand on its own does not create conflict. Instead, it is a set of two or more demands which can create conflicts. A single external demand can create conflict when it challenges an internal organizational demand or two external demands can conflict with each other. At the same time, multiple demands can also positively reinforce each other rather than create conflict. Based on the discussion above regarding institutional demands on the MNC, the cross-border business model faces multiple demands across potentially nested levels from multiple sources which can generate multiple conflicts.

Adaptation

Adaptation may occur pro-actively to provide multiple contingency options for uncertain task environments (Thompson, 1967); however, structural inertia may slow these changes and must be overcome to survive environmental changes (Hannan and Freeman, 1977; 1984). Adaptation may also provide access to critical resources due to dependency (Pfeffer and Salancik, 1978) or ceremonial purposes (Meyer and Rowan, 1977). In addition to survival and access to critical resources, matching the business model to environmental demands and conditions can generate long term economic returns (Dow, 2006; Samiee and Roth, 1992). Thus, adaptation is a critical strategy, particularly across borders (Ghemawat, 2007).

Business Model Adaptation

The concept of business model adaptation (BMA) is not explicitly elaborated in the literature, but rather is included together with the related concepts of business model innovation (BMI) or business model evolution (BME). All three of these constructs are connected to business model change. With the exception of Santos et al. (2009) who identify types of organizational BMI activities, the work on BMI tends to describe the organizational characteristics which support the innovation rather than discussing the types of BMI. For example, learning and discovery through experimentation are imperative for innovation and evolution due to the complexity of the business model and its environment (Chesbrough, 2010; Demil and Lecocq, 2010; McGrath, 2010; Sosna, Trevinyo-Rodriguez, and Velamuri, 2010; Svejenova, Planellas, and Vives, 2010; Teece, 2010).

Though most approaches are path-dependent, Johnson, Christensen, and Kagermann (2008) suggest a more radical approach where BMI starts with identifying the value proposition, designing the optimal production and delivery of this value proposition, and then comparing it to their existing model. They suggest not undertaking BMI unless it will be 'game-changing' (Johnson et al., 2008: 56). This radical-only focus neglects the potential for small changes that can help to maintain or differentiate the existing model. The adaptation may also be radical regarding some components and not change others leading to potentially path-dependent radical adaptations. Whether the change is radical or historically connected to past

experiences and choices, the strategic adaptive responses are yet to be studied more comprehensively.

Strategic Tactics

While falling short on explaining how the business model gets adapted as a system, the literature provides some insights into strategic tactics for adaptation in general. Ghemawat (2007) offers a list of adaptive tactics across products, policies, positioning, and metrics.. In discussing the adaptation sublever of 'partitioning', Ghemawat (2007: 125) suggested, 'Partitioning can occur at multiple levels, but at its simplest, it involves clearly separating elements that can be varied across countries from elements that are integral parts of a complex system that should therefore not be tampered with on a piecemeal basis.' However, multiple sources of demands may create conflicting pressures for integral parts of the business model. In addition, Ghemawat (2007: 133) notes, 'The levers and sublevers … help relax the underlying tension between complete localization and complete standardization, but that still leaves open the question of how much to adapt.'

Similarly, the literatures on resource dependency and institutional theory also offer several strategic responses to adaptation. For example, in the face of complexity from resource dependency, Alexander (1996: 799) shows that organizations will use 'buffering, resource shifting, multivocality, innovation, and creative enactment.' She also suggests that organizations map, deflect, or exploit external complexity which creates internal conflict over goals (Alexander, 1998). Though these tactics link the

organizational response and the resources required, they do not include the full system of the business model including the full set of the resources, value chain, and value proposition.

Strategic response to institutional demands has centered on organizational structures, practices, and goals. For example, Oliver (1991) suggests several general responses to institutional demands for conformity (i.e. adaptation to match the environment) and more specifically conflicting institutional demands (Kraatz and Block, 2008; Pache and Santos, 2010). Oliver (1991) suggests that organizations can conform and adapt or they can undertake different strategic responses which vary in degree of resistance, i.e. acquiesce, compromise, avoid, defy, or manipulate. She also notes that multiplicity of institutional demands enables greater resistance (Oliver, 1991) but does not explain how they affect the business model system.

We see that conflicting institutional demands lead to the development of different and competing organizational practices (Lounsbury, 2007) particularly when different types of logics interact (Greenwood, Diaz, Li, and Lorente, 2009) or hierarchical interactions lead to goal conflicts (Purdy and Gray, 2009). Each of these works focuses on practices or more generally, organization. However, the resources involved also have value and meaning generated from institutional sources (Maurer, Bansal, and Crossan, 2011). Also, they tend to compare the organizational response of populations, or fields, where conflict is between fields rather than specifically on a single organization. The cross-border business model, however, faces multiple fields and

pressures (Kostova et al., 2008). Thus understanding the responses to localization pressures for the cross-border business model system is critical.

Kraatz and Block (2008) offer four organizational responses based on conflicting internal organizational identities associated with 'institutional pluralism'. They suggest that the organization may eliminate the conflict through adaptation, compartmentalize it and deal with it independently, balance the demands, or create a new organizational identity. These suggestions leave room for exploration by considering the interconnections of the business model components. Adapting to eliminate the conflict assumes that the conflict can be resolved at all. Assuming that it is possible, what components change and why? How do you compartmentalize the conflicting demands and deal with them independently when you consider the internal connections between the business model components? Similarly, how is balancing of demands achieved? Forging a new business model is relatively unlikely when you consider that it would require a change in the business model logic that organizes the existing business model. Chesbrough and Rosenbloom (2002) show that technologies that do not fit with the existing business model tend to be passed over and/or externalized from the firm. Development of the misfit innovations are either stifled or turned into new business models through external entrepreneurial efforts. Considering the multi-component, interactive nature of the business model will shed considerable light on the strategic responses to multiple demands.

This dissertation attempts to add to the existing literature on business model adaptation (BMA) by viewing the business model as a system of components.

Contextual Effects

By definition, adaptation is a response to environmental pressure which essentially boils down to external fit. As noted above, the business model draws in the question of internal fit as well when the various components are considered. In addition, there are many external demands and conditions which can influence each component. Multiple sources of pressures and conditions create a diverse set of demands that may affect the set of components differently, thus the question of how multiple demands affect BMA.

Internal fit within the components as well as with the business model logic must also be balanced with external fit with the environment. Much of the work on business models considers business model change to occur through an interactive process within the firm and in interaction with the environment. Teece (2010: 177) notes, "Business models must morph over time as changing markets, technologies, and legal structures dictate and/or allow." The business model must have external fit with the environment in which it is embedded, however as noted by Kostova et al. (2008) for the MNC, the multi-faceted environment of the cross-border business model is not always consistent.

External fit then must consider external multiplicity or diversity. However, the multiple demands and conditions from diverse sources can support the existing business model. In a similar way, various types of distance are important, but in nuanced ways. Institutional distance can be a problem for knowledge transfer (Kostova, 1999), but also positive when it leads to recontextualization (Brannen, 2004). The prior showed how distance increases resistance to implementation without adaptation. The latter case demonstrated distance to be supporting of the existing model. When Disney went to

Japan, the amusement park business model was held constant and the Japanese consumers saw added value of an American experience in addition to the basic value created in the US. However, this was not the case in Europe where the institutional distance was less and the European customers saw the lack of adaptation as a lack of responsiveness rather than as an American experience. Thus Euro-Disney required more adaptation. Similarly, Gupta and Govindarajan (2000) noted how the American restaurant chain, TGI Friday's, adapted their menu in Korea and not only missed out on the added value of recontextualization but also incurred costs of adaptation. Geographic distance can cause problems with transportation and communication, but this may also enable arbitrage (Ghemawat, 2007). Distance on its own then needs to be qualified within the business model. The various types of demands become pertinent to business model adaptation depending on their effect on the existing business model. Thus the many external demands should be considered based on the degree of congruence: congruent and supporting, orthogonal but not conflicting, or conflicting.

The embedded nature of congruence requires a baseline for comparison. Demil and Lecocq (2010: 237) explain how the environment affects the business model,

> 'Thus, although the environment is not in itself a core BM component, environmental evolutions are endogeneized into the firm's RCOV framework via their impact on each of its components, so that external influences may ultimately affect the volumes and structures of costs and products.'

Conceptualizing the business model as realized strategy (Casadesus-Masanell and Ricart, 2010), the business model can be viewed as a nexus of strategic responses to the set of demands to which it was subjected. The congruence of the external demands and the existing business model creates a mutually constitutive relationship between the

environment and the business model. The level of analysis then becomes the business model response at a point in time to a specific conflict between demands and the existing business model. To assess the strategic responses for the business model, this dissertation examined various conflicts. . Identifying a starting point was critical to establish a baseline for the model and the ensuing analysis.

Chapter Summary

The business model is the way a firm organizes (O) its available resources (RC) to deliver and capture value (V). The business model RCOV framework helps to simplify the internal complexity into fundamental elements that can be generalized across firms (Demil and Lecocq, 2010). However, considering all the components limits the ability of existing theories to explain value capture (Amit and Zott, 2001). Multiple components also make it difficult to assess a priori how business model adaptation will occur.

At the same time, a cross-border business model is exposed to many contextual pressures generated from a semiglobalized world (Ghemawat, 2007). A variety of contextual influences exist ranging from the business environment, i.e. consumer demand, technological constraints, and competitive pressures (Porter, 1980, 1986), to multi-level institutional contexts (Kostova et al, 2008). Each source creates different pressures which are sometimes conflicting.

The multiplicity of demands that arises draws out the question of how to respond. The work on Integration-Responsiveness and the MNC suggest carefully balancing global efficiency and integration with local responsiveness. However, the answer to how that occurs has only been studied in pieces by looking at only the product offering, the

organizational practices used, the global organizational structure, or the degree of local resources used. This leaves open the main research question of this dissertation, how does the business model adapt as a system to the multiplicity of demands in the environment.

CHAPTER 3

RESEARCH DESIGN

As noted from the theoretical background above, the research design must be able to handle complexity and diversity. This chapter first describes the unit of analysis to clarify how and why the business model construct would be utilized. Then it introduces the inductive case study methodology used followed by the discussion of the research site. The data collection and analysis techniques are elaborated before a short summary to close out the chapter.

Unit of Analysis

The business model as the level of analysis was chosen because it provided an opportunity to examine the interactions between firm strategies in a systemic way. The firm must choose what to offer and how to organize resources and competences to deliver what it offers in such a way that involved parties capture sufficient value. Looking at changes in a single element ignores the ties back to the other pieces of the model. A practice or set/system of practices would be an example of organizing. Though interesting and compelling as a unit for study, much existing work clearly discusses internationalization effects for practice transfer (e.g. Kostova, 1999) or transfer of a system of practices such as Six Sigma, a set of process improvement practices (Yu and Zaheer, 2010). Extending the scope of analysis to include other organizational elements, resources, and the value proposition together better

represents the internal complexity which managers must include when deciding how to respond to external contextual pressures. For this reason, the business model was selected as the level of analysis.

Methodology

To answer the question of how the complex cross-border business model system responds to multiple demands, an in-depth examination of the complex external effects on the business model along with the internal systemic implications was required. The external demands and conditions can affect the business model as a holistic system or by affecting its different components – resources and competences, organization, and value proposition. Given the complexity of the interaction of multiple elements (both internal and external), a qualitative research design was selected involving an in-depth case study (Eisenhardt, 1989; Yin, 2009) across multiple international environments. Multiple sources of information were used to inform this case including interviews, primary documents, and various types of archival data (Eisenhardt, 1989; Eisenhardt and Graebner, 2007; Yin, 2009).

I followed Eisenhardt (1989) and Yin (2009) who suggest that the research question and constructs should be identified upfront to limit over-collection of data and to guide the analysis. The complexity of both the external and internal environments only allowed for a very broad outline of the research: How do business models as a system respond to multiple demands from the environment? Considering the interest in cross-border adaptation, theoretical sampling was used to focus on a business model

operating across many countries. The 'embedded, single-case design' (Yin, 2009: 46) used each example of conflicting contextual demands as a unit of analysis to be used for comparison, confirmation, and theoretical extension. In order to provide a conservative test for the need for business model adaptation, a case was chosen that would be a least-likely case (George and Bennett, 2004). Based on examples from the global strategy literature (e.g. Ghoshal, 1987: 426), an MNC in the global aviation equipment services industry, 'Aero' was chosen. Furthermore, when the project was first discussed with the CEO, he said, 'I'm not sure that nation-states matter per se.' At that point, data collection continued with a search for both international variation as well as global consistency.

Research Site

Aero is a subsidiary of a large, Western multinational that is an original equipment manufacturer (OEM) and servicer of aircraft engines. The subsidiary is a multinational unit that operates a cross-border service business model which is the focus of this study. The Aero Services business model operates within a single MNC in a single industry that has customers and operations in more than 70 countries around the globe which offer a range of exposure. Table 3.1 summarizes the countries serviced by geographical region.

Table 3.1
Number of Countries with Full Service by Geographic Region

Region	No. of Customers
North America	6
Caribbean	7
South America	4
Europe	23
Middle East	8
Africa	9
Asia	11
South Pacific	5
Total	73

The Aero case is used as 'inspiration' (Siggelkow, 2007) for the adaptive strategies which can potentially generalize across models and industries which face similar conditions of multiple embeddedness. While the model employed by Aero may or may not be used by other firms, the various strategic responses provide valuable insights for studying firm-specific business models across industries. The Aero case is also 'representative' (Yin, 2009) of large firms in global industries who demonstrate Porter's (1986) 'global' model. The Aero model displays many similarities with other rivals and the contexts relate directly to those of oligopolistic, original equipment manufacturers (OEMs) in global industries such as electronics, semiconductors, and construction equipment.

Theoretical sensitivity was used as the analysis progressed. Since the main concern of this study is to understand the internal systemic reactions to multiple demands imposed by external factors, a single firm that operates in and services multiple environments was selected as the research site. Initially, the question was about

identifying a single overarching relationship between multiplicity of demands in general and the business model response. As the case study progressed, different strategic responses became apparent through the multiple embedded examples. Additionally, multiplicity of demands did not necessarily imply that there was a conflict. Several types and even levels of demands were congruent and positively reinforcing each other while others were directly contradictory or simply pulled the model in new directions. The analysis moved to specific responses to incongruent demands.

Data Collection and Analysis

Consistent with the inductive case study method, many sources of data were used within the Aero case. Interviews and many sources of archival data make up the majority of the inputs. To increase the reliability of the findings I used Eisenhardt and Graebner's (2007) recommendations and guidelines. As they point out, 'as research incorporates more cases and moves away from everyday phenomena such as work practices to intermittent and strategic phenomena such as acquisitions and strategic decision making, interviews often become the primary data source' Eisenhardt and Graebner (2007: 28). This draws questions of reporting bias which they note can be mitigated by various tactics (Eisenhardt and Graebner, 2007: 28),

> 'A key approach is using numerous and highly knowledgeable informants who view the focal phenomenon from diverse perspectives. These informants can include organizational actors from different hierarchical levels, functional areas, groups, and geographies, as well as actors from other relevant organizations and outside observers.'

Accordingly, I conducted interviews with various boundary-spanning Aero executives across hierarchical levels and functions to gather critical information about the business model, influences on the model, contexts, consistency and variation.[2] This provided a diverse set of perspectives on the business model and the related strategic responses which helped to triangulate the results and eliminate the potential for individual reporting bias. It also provided more richer and broader descriptions regarding the model and the contexts. The examples discussed by the executives ranged from past experiences to current pressures that were being experienced which helped to reduce the concerns over recall bias (Eisenhardt and Graebner, 2007; Leonard-Barton, 1990).

Eleven interviews were conducted with eight Aero executives ranging from 30 to 120 minutes in length, the majority close to an hour. A semi-structured interview process (Brannen and Salk, 1999) was used. The interviews started with a brief description of the RCOV business model framework (Demil and Lecocq, 2010) and the CAGE distance model (Ghemawat, 2007). These were used as conceptual kindling to help spark discussions about what was actually happening (and important for the participants) in the case study. Probing and clarifying questions were directed at four main areas:

- Business Model description
- Variation (or lack thereof) in the business model
- Causal factors for the variation

[2] The list of executives and their positions is included in the appendix. See Table A.1. They range from the CFO of Aero and CEO of Aero Services to Repair Site Manager. The functions span finance, operations, commercial/sales, product line, and continuous improvement/productivity. Public interviews from customer and competitor executives and news releases were also leveraged.

- Drivers of performance

The interviews were only one part of the data pool. Primary documents such as business policies, strategic plans, press releases, annual reports, websites, and contract performance reports were gathered along with secondary information such as case studies, third party interviews, news articles, and other references from the academic and practitioner literature. In addition, email correspondence with managers from the company was used to clarify certain aspects of the operations.

Primary documents were either sent from Aero managers or accessed directly from the Aero internally controlled version of the internet. For example, contract information and financials were sent directly, and the strategic operating plans, business policies, organization charts were accessed through their internal websites. This approach to data gathering helped limit the potential bias in the delivery of documents. Other archival data was accessed through the World Wide Web including 15 years of monthly press releases (1997-2012), website descriptive information, and annual reports. Other secondary sources were also leveraged such as news articles, public interviews, literature that analyzed the industry or related industries, and case studies of the company. These various sources help to remove bias of individual interviewees and triangulate for increased validity of the study (Yin, 2009).

The descriptions of the frameworks from the literature that were used to start off the interviews provided some initial broad constructs and relationships, however, more detail from the multi-functional perspectives coupled with constructs from the literature expanded the potential coding set. For example, the organizational element led to a

discussion of the reporting structure of Aero along with various organizational activity sets that form the value chain (Porter, 1985). The contextual environment expanded into types of influences such as technical or task (Thompson, 1967), industry competitive (Porter, 1980), various levels of institutional (Kostova et al., 2008), and geographic/natural environmental (Ghemawat, 2007).

As is typical of the inductive process, the data collection and analysis occurred through continuous iterations as opposed to data collection and then analysis (Eisenhardt, 1989; Yin, 2009). Constant comparison was used in a few related ways. First, it was used to compare between emerging theory and the existing literature. The study was rooted in the business model literature (e.g. Amit and Zott, 2001; Casadesus-Masanell and Ricart, 2010; Demil and Lecocq, 2010; Teece, 2010) and the institutional theory literature (e.g. DiMaggio and Powell, 1983; Kostova et al., 2008; Meyer and Rowan, 1977). The initial interview with the CEO of Aero Services suggested that other factors needed to be considered as well. Thus, the global strategy literature (e.g. Ghemawat, 2007) was also incorporated to help identify several influential factors in addition to institutions, such as industry contexts, and technological implications. Also, the literature on population ecology (Hannan and Freeman, 1977 and 1984), contingency (e.g. Thompson, 1967), and embeddedness (e.g. Granovetter, 1985; Dacin, Ventresca, and Beal, 1999) all had different potential implications for the relationship between the environment and the business model. Finally, the systemic nature of the business model also drew in the concepts of organizational fit (Siggelkow, 2001 and 2002) and much of Danny Miller's work on configurations (e.g. Miller and Friesen, 1984).

All seemed to offer insights into what was happening in the case, but none were able to fully explain the full picture. The data was constantly compared with the literature (through many revisions). This approach did raise more questions than were answered, but it ensured maintaining theoretical sensitivity.

The second use of constant comparison, identifying cross-case similarities and differences, helped to generate new theory regarding the relationship between the contextual pressures and the business model. The iterative nature of comparing between the literature and the cases (individually and across them) showed that many related constructs boiled down to the base construct of congruence between the various sources and levels of pressures and the way they influenced the business model. In addition, the cross-case comparison enabled simplification from the many cases to see range and repetition.

Inducing theory from the cases studied against the multiple literatures background helped synthesize observations across cases and generate a better understanding of what adaptive strategies were taken when the business model was considered as thesystemic unit of analysis. In the next section, the base case (original model and ongoing central model) and seven other embedded examples are discussed in more detail before describing the outcomes of the cross-case comparisons and the related drivers of those adjustments.

Chapter Summary

An inductive case study research design (Eisenhardt, 1989; Eisenhardt and Graebner, 2007) was leveraged due to the extreme complexity in both the environment

and the business model. A single cross-border business model with multiple embedded cases provided a setting to compare variation while controlling for firm and industry characteristics. The focus of the case was on the jet engine service model of Aero, a Western MNC that both manufactures and services jet engines. Multiple primary and secondary data sources were used including but not limited to interviews, policy documents, organization charts, contract performance reports, press releases, annual reports, and previous academic studies. The diversity of inputs was used to triangulate on the components of the business model, its environmental pressures, global variation, and performance.

Multiple methodological tactics were used to ensure the validity of the findings. First, the single business model allowed for direct comparison between the embedded cases. At the same time, Aero was chosen because it was a least-likely case for adaptation. Various aspects of process-tracing (George and Bennett, 2004), constant comparison, and theoretical sensitivity were used in combination with pattern-matching (Yin, 2009) to improve the external validity.

CHAPTER 4

RESULTS: AERO BASE BUSINESS MODEL CASE

The base business model is a critical first stage of the research process to set the baseline for comparison. In this chapter, a detailed explanation of Aero's base business model is given followed by a description of the supporting demands and conditions. The RCOV framework is used to organize the explanation of the business model starting with the value proposition (V), then the organization (O), and finally the resources and competences (RC). The supporting demands are then identified to demonstrate the starting context. These supporting conditions are divided into business and institutional contexts. The base case and supporting contexts, Case 0, is summarized at the end.

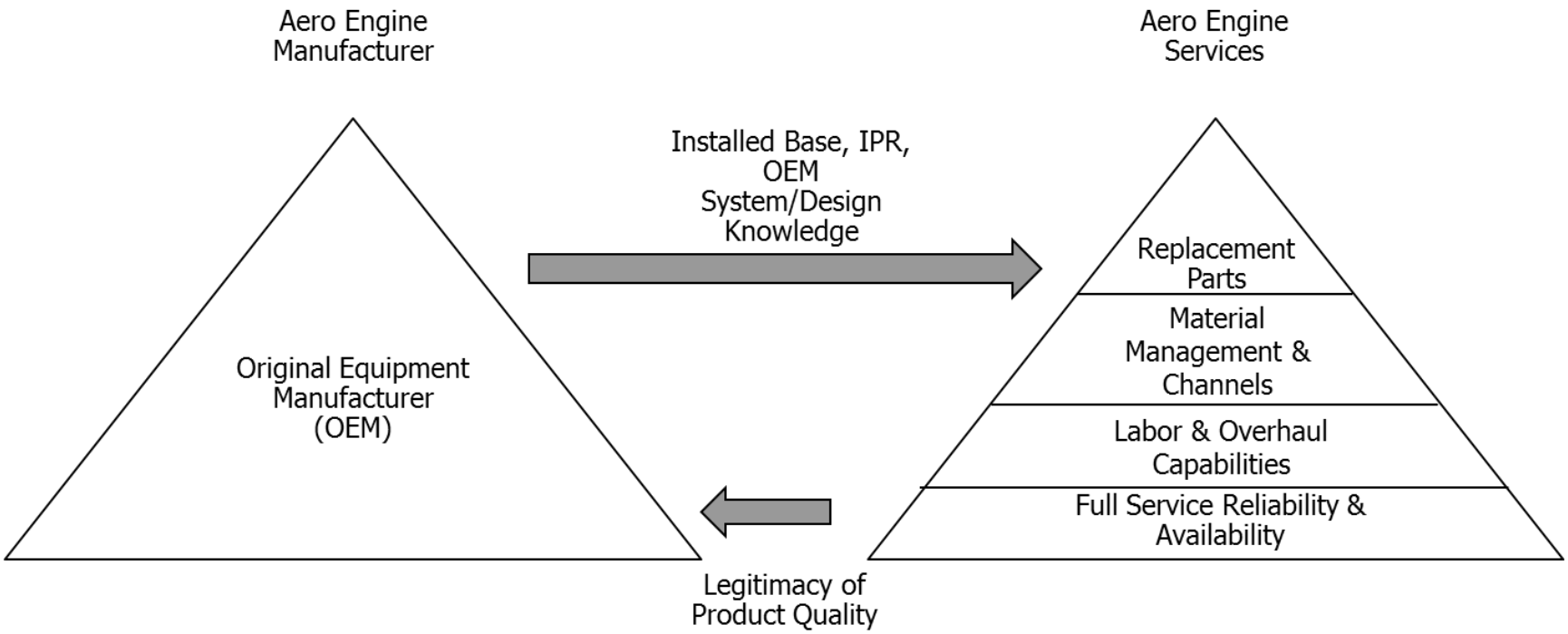
Business Model: RCOV Framework

The business model studied in this work is the aircraft engine services model for Aero. The model discussed here was considered the base case for several reasons. First, Aero had been applying this model since they entered the engine service business more than 50 years ago. They currently still leverage this model for over 75% of the contracts which they support. In addition, the commercial operations manager noted that Aero offered 'variation on a theme' that starts with a 'base overhaul'. The 'base overhaul' as a 'theme' provides a starting point for the Aero service model. The large engine manager also noted that several customers were 'starting to do their own

maintenance. [European customer] was the first, they started 10 years ago. [Asian customer] was second, they started 7 years ago. Then it starts to hub out. … We used to do it all in [our service shop]. Now you're fractionalizing it.' Since Aero used to do all the overhaul work internally as part of the 'base overhaul', the base case model is this internally centralized and standardized overhaul model which is described in more detail below.

The services aspect could be considered to be only an add-on to the engine-replacement parts model. In a way this is correct, however, the engine services offering provided legitimacy to the OEM engine manufacturers by showing they will assume the long term operating risk of their products. Considering this, the aircraft engine service model is a crucial model in itself that must be considered. In addition, Aero considered the service model as a separate business unit which included replacement parts as a product line within the service offering. The Aero service business model included both the replacement material and the labor to maintain the engines. The Aero engine base model was considered as the focal model, but it is contextually influenced by the Aero OEM engine manufacturing model. Figure 4.1 shows a general diagram of how Aero's engine services business model was affected by their engine manufacturing business model. The engines on commercial airplanes needed to be continually serviced or maintained. Aero established ongoing contracts to manage this maintenance and repair process for the airline customers.

Figure 4.1
Aero OEM Engines Model Interacting With Aero Engine Services Model



Being an engine OEM provides cognitive legitimacy through perceptions of systemic connections within the engine. It is also supported by regulative institutions for IPR protection. The engine OEM business model supports the opportunity to capture replacement material revenues. The risk transfer segment yields legitimacy to the OEM engines.

In this section, a detailed explanation of the base Aero service business model is given.[3] The RCOV business model framework mentioned above is used to frame the discussion of the baseline business model so each component is clear. The value proposition is first, followed by a discussion of the organizational structure and value chain, and finally the resources and competences are identified. The supporting demands are then discussed.

The basic value proposition (V) within the Aero service model is the safe operation (reliability) of an aircraft's engines such that 'time-on-wing' (availability) is maximized through quick 'turnaround time' and cost is minimized. 'Quality is paramount.' This means that there will be no failures of the engines while in use. The product must perform to a level safe enough to fly or be repaired or replaced prior to flight. For example, Qantas Airlines grounded their fleet powered by the Airbus A380 engine after a flight had to make an emergency landing after a large blast blew the engine cover off one of the engines (Qantas Press Release, 2010). This has led to significant investigations regarding the engine design and equipment maintenance. If the equipment maintenance had been at fault, the equipment servicer would have had a significant liability.

The organizational (O) component discussion can be seen in two parts: global structure and value chain. The basic organizational structure is closest to Porter's (1986) global model with a centralized location for services and decision-making along

[3] The business model in this dissertation is a representation of the related service model for a single engine type. Engine types vary based on thrust output to support various geographical and technical applications. Each of the engine types within Aero demonstrated a similar engine service model.

with standardized production. Engines are standardized by engine size which leads to a centralized service operations and purchasing of material components. The finance manager supported this when asked how much was purchased locally,

> 'Minimal. The projects we are working on now are looking at why are we purchasing anything locally. An engine is an engine, we should have the parts. … It's literally nuts and bolts, things you could pick up at a hardware shop. I wouldn't say a mom-and-pop hardware shop, but a hardware shop. It's relatively small and limited.'

Besides a centralized material buy, the majority of the decision-making occurs at headquarters where most of the support functions such as Finance, Marketing, Human Resources, and Information Technology are located. The overhaul and service operations for each engine type is typically serviced internally at a single global overhaul location. Sales and support were located at or near the customer to collect information and manage relationships, but the information was conveyed back to headquarters for decision purposes. The commercial operations manager noted that projects were being implemented to formalize and standardize the decision processes through 'automated tools to work real-time.' This would reduce the time 'manually crunching numbers' or in 'queue time' between information transmission to headquarters and the offer decisions. However, the 'crunching' and standard setting was still done by a team at headquarters. The project focus was on reducing wait time and formalizing decision rules rather than fully transferring strategic decision-making. The baseline organizational structure was considered to be centralized because of a single location to complete overhaul work for a given engine size and headquarter control of critical decision-making. The base model was considered to be standardized because of its consistent products, materials, and processes.

This 'global' model had a value chain that organized various resources and competences (R/C) across several stages. First, the ties OEM engine model mentioned above and the related design capabilities facilitated replacement parts as well as specially developed material repair processes. This technology and the related competences formed the backbone of the Aero service model. The Aero website supports, '[Aero] is the world's leading provider of aviation services.' 'Technological excellence, supported by continuing substantial investments in research and development, has been the foundation of [Aero]'s growth and helps to ensure quality products for customers.' Aero has strong technology that can improve the operations of their customers today along with the capabilities to identify and implement innovative technology solutions for tomorrow.

The technological resources and development capabilities were the core of Aero's economic sustainability and market position. According to Teece (2010: 177),

> 'The 'razor-razor blade model' is another classic (and quite generic) case of a well-known business revenue model (which is just one component of a business model), which involves pricing razors inexpensively, but aggressively marking-up the consumables (razor blades). Jet engines for commercial aircraft are priced the same way – manufacturers know that engines are long lived, and maintenance and parts is where Rolls Royce, GE, Pratt and Whitney and others make their money. So engines are sold relatively inexpensively – but parts (and service) involve considerable mark-ups and represent an income stream that may continue for decades.'

The Aero finance manager confirmed and added that the maintenance contracts pull through the parts which generate the primary margins for the Aero engine service model. Considering this, the replacement materials segment of the Aero service

business model represents the embedded technology and the core of the model advantage.

Managing the material and inventory to optimize between the availability of the engines and the capital cost of holding inventory on hand are critical competences utilized in the second stage of the Aero base model. Holding material in inventory ready to be used decreases waiting time when an engine needs to be repaired, but to have material that is not being utilized uses capital which costs money through interest carrying costs or foregone investment opportunities. Similar to the skilled labor and maintenance capabilities, the material management competence is also developed over time through experience and nested within routines. Centralization of the overhaul service centers for an engine model limits redundancy of inventory and some of the complexity of managing the material.

The third stage which leveraged the available materials along with the knowledge used to implement the repairs and the engine overhauls, provided another resource that is generated through experience. The knowledge of what and when to change is critical to maintaining reliable and available engines while also limiting the cost of service. Similar to the engine technology, the knowledge of repairs and servicing also has a present and future component. It enables cost effective service in the present and provided knowledge of critical needs for continuous improvements such as new repairs and material upgrades. This knowledge was embedded in the resource of skilled labor and organizational routines helped to nest this knowledge within the organization as well (Cyert and March, 1963; Nelson and Winter, 1982). These repair and service

resources were reinforced by a continuous improvement group that identified, developed, and implemented new repair and material innovations.

The final stage of full service included reliability of the engines. Risk management was a competence needed to support the engine service process. Various aspects of risk had to be managed to optimize returns and sustainability. Operating risk had to be managed to ensure that the engines would be reliable and not have a failure in service that could cause a plane crash. Financial risk had to be monitored to ensure credit worthiness of customers due to the large capital outlays and the long term forecasting used to manage the appropriate accounting. These competences were also built into organizational routines which help to ensure the provision of full service models and risk transfer offerings.

Through the value chain, significant capital outlays were necessary. In addition to the sheer size of the engines, the development of the material, repairs, and tooling engendered extensive investments. Providing ongoing service for 72 global customers required a large amount of inventory and structural overhead. Additionally, the experiential knowledge capabilities required time to develop which further added to the need for capital. Furthermore, the significant downside potential of the risk required hedging. All of these increased the necessary capital for Aero's base model.

Aero's base model closely resembled Porter's (1986) 'global' model in that it was centralized with various types of standardization from products to processes to decision-making. The base model had a value proposition of providing reliable and available jet engines delivered through a value chain that started with replacement

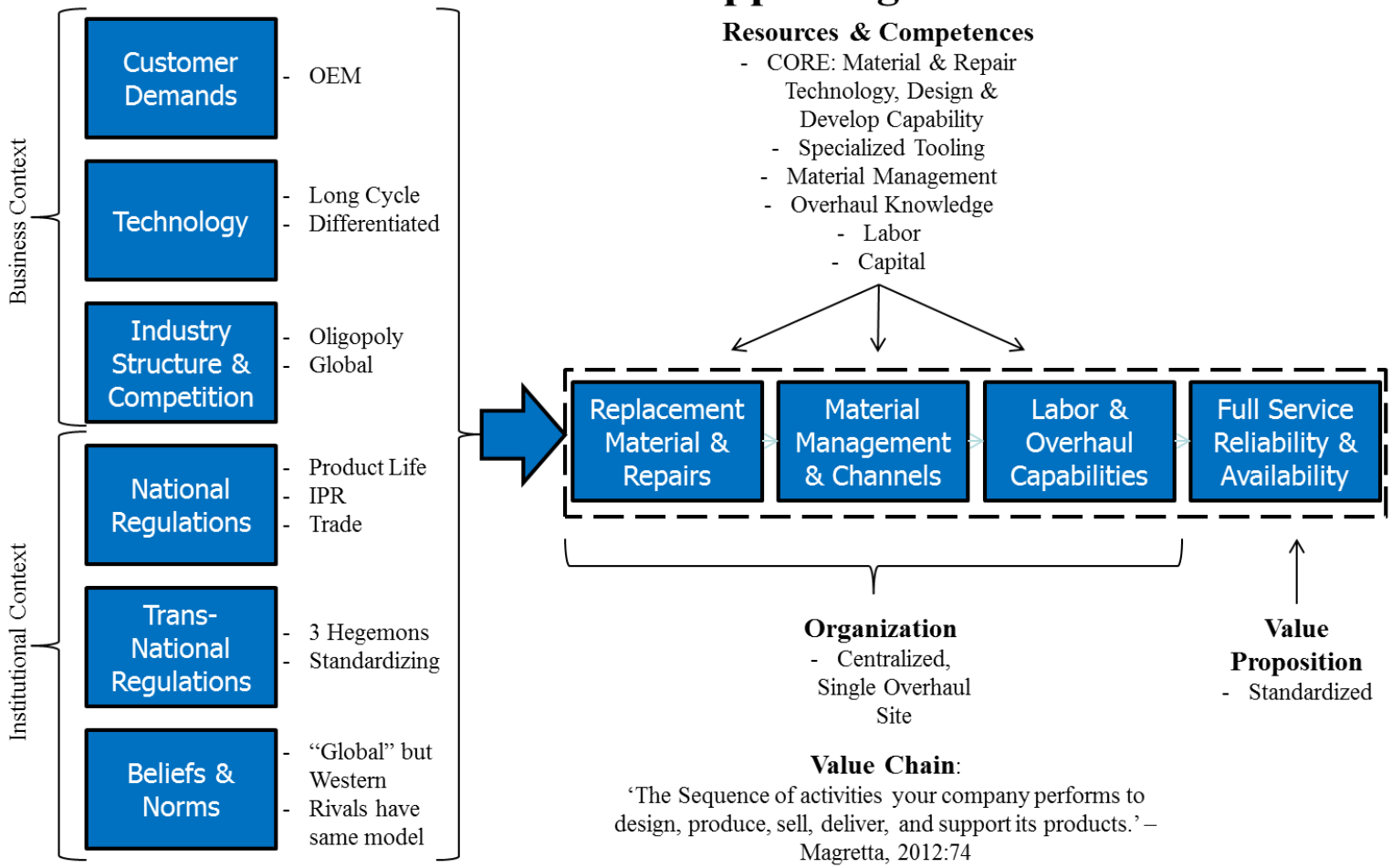
parts and repairs and extended through material management, overhaul execution, and risk management. Aero captured the majority of its value through its core, the replacement material technology and repairs. This base model was supported by several task and institutional demands and conditions which are discussed next.

Supporting Pressures and Conditions

The Aero business model was consistent with key demands that reinforced its emergence. Figure 4.2 demonstrates the base model value chain as well as the set of demands that supported it. As noted above, the multiple demands and conditions can be generated from technical, task, competitive, social, political, and institutional sources. The various sources can support the existing model[4] or create conflicting pressures. The supporting demands are discussed here starting with the business environment and then the institutional conditions.

[4] The mutually constitutive nature of the business model and its environment suggests that the demands support the base model which reinforces the demands. For a more detailed discussion see for example Crouch (2008).

Figure 4.2
Base Model and Supporting Demands



Business Environment

Multi-level Demands for Safety. Personal security is part of most human psychological motivations (Maslow, 1943). The primacy of personal security over other non-physiological needs is debated (Hofstede, 1980), but there is little debate over the global presence of the need for personal security in the airline industry. This drive for personal safety is reflected in the national regulations for safe transportation, and also aligns with what one Aero engine type manager noted about the need for self-regulation regardless of regulatory oversight,

> 'We're a self-regulated industry. The FAA has roles, but if the airline companies, if the air-framers and the engine companies didn't self-regulate, the world would struggle. The FAA because they have an influence on us they set guidelines, but they're not auditing everything. They can't. They put regulations in place and we self-audit. We're pretty tough. Safety and reliability are paramount above any business metric and I'll tell you that is a fact.'

This suggests the need for the airlines to maintain the utmost safety with zero incidents of failure. The pressure for perfection in air travel facilitates a drive for the equipment manufacturers and the service providers to make sure the equipment does not fail. This is embodied in the simple quote from another Aero executive, 'Quality is paramount.'

Demand for Original Equipment Manufacturing (OEM) Service. Demand for aircraft safety and engine reliability supported Aero's base model through demands for the OEM to service their own engines. Several of Aero's customers also associate OEM and quality. For example, the VP of Technical Operations of a customer commented at the deal signing,

> ‘As the engine OEM, [Aero] is well suited to maintain the [Aero engine type] engines and provide us with world-class quality service and repairs for our engines, which are critical to our business model.’

As an original equipment manufacturer for the engines, Aero generates intimate knowledge of the interconnections between all the components of the overall engine system through the design and test of the full engine. For example, when asked whether Aero services competitor engines the commercial operations manager stated, ‘On our engines, nobody in the world knows them better than us. Nobody else in the world can make that statement.’ The manager of the large engine type also explained,

> ‘There are people in the world that are trying to build generic parts. Like [Aero’s rival], they were building [Aero engine type] parts. It becomes risky because they don’t understand the technology and the analysis behind the whole engine, the system. So now you have these places around the world that are starting to grow and do their own repairs. For [one airline customer] we try to license our repairs for them to do so it stays legit.’

The Aero’s General Manager of Repair further supported the connection between OEM and quality with her statement,

> ‘[Aero] is the first in the engine repair industry to introduce these extended warranties on [two Aero engine type] engines because we are dedicated to raising the standard of OEM value and quality.’

The value generated from OEM-provided service was evident in the comments by customers, but was also used as a marketing tool. The term original equipment manufacturer, or OEM, is used repeatedly on their website, press releases, and other documents as they describe themselves and their products. The other OEM rivals use similar approaches with their discourse as well. See Table 4.1 for a sample of OEM discourse from Aero managers.

Table 4.1
OEM Discourse

Source	Quote
Commercial Ops Manager	On our engines, nobody in the world knows them better than us. Nobody else in the world can make that statement.
Engine Manager 1	If you build a generic part, that would be a PMA. And there are people in the world that are trying build generic parts. Like [Aero rival], they were building [Aero engine] parts. It becomes risky because they don't understand the technology and the analysis behind the whole engine, the system.
Finance Manager	we are manufacturing the engines, we want to give peace of mind that we know how to overhaul our own engines.
General Manager of Repair	[Aero] is the first in the engine repair industry to introduce these extended warranties on [two Aero engine type] engines because we are dedicated to raising the standard of OEM value and quality.
VP of Technical Operations at Aero Customer	As the engine OEM, [Aero] is well suited to maintain the [Aero engine type] engines and provide us with world-class quality service and repairs for our engines, which are critical to our business model
CEO of Aero Services	The [Service] agreement will ensure the airlines will receive high quality OEM material and repairs to help its engines remain in top performance condition.

Several statements were made regarding the need for Aero to service their own engines. Shimp and Bearden (1982) show that offering product warranties that are not perceived as too good to be true increase the perceived quality of the products. For Aero, they are willing to take on the operating risk associated with long term service contracts to increase the perception of quality for their engines. The ongoing execution of these long term contracts demonstrates that the warranties are realizable. In order to maintain legitimacy and credibility for the new engines being sold, Aero must be

willing to undertake the potential risk of servicing those engines over time. The Finance Manager noted,

> 'Do you even want to be in business of turning wrenches. One would think that given we are manufacturing the engines, we want to give peace of mind that we know how to overhaul our own engines. There are a lot of different players involved. It's a matter of keeping all your partners happy and trying to spread the wealth if you will.'

In addition, Aero must retain the systemic knowledge of component interactions within the engines which is reinforced through the long term service contracts. Without this legitimacy and related knowledge, generic providers would be able to erode the margins in their core - the parts segment.

Technical and Competitive. Based on Porter's (1980) 5-forces model, the aircraft engine services industry is a global industry. The aircraft engine service industry has three main OEM engine producers which service engines (one of which is Aero) as well as several third party servicers which are either partnerships between the OEMs, component suppliers who have forward integrated, airlines who have integrated backward, or independent providers. The industry is characterized by a long term product cycle with high start-up costs, extreme amounts of scale needed to operate efficiently, and a steep learning curve for the repair and overhaul process. This restricts entry and exit. It is a mature industry with relatively consistent growth rates.

The aircraft engine services industry competes across national borders for customers. Though the customers are relatively constrained to national boundaries except as specified by Freedoms of the Air agreements, the engines are relatively

unrestricted across borders allowing them to be exported to centralized operations to perform necessary repair and overhaul services. The engines are characterized by high levels of proprietary technology which are controlled through centralized operations which also supports the development of a consistent pool of talent. Because of this, the competition can be considered to be 'Global'.

Most of the barriers to global competition noted by Porter (1980) are not present or at least not highly influential. In the case of Aero services, transportation costs are high, but not significant enough to make the global pressures irrelevant. Product needs are similar, mainly because the engine products have a very long technological development cycle in the highly regulated environment. One of Aero's engine model managers confirmed this engine standardization,

> 'It's tough to differentiate the product itself. I mean an aircraft engine is an aircraft engine. … There's not a lot of product specialization that you could do around the envelope. They're just too expensive, the engine is just too expensive to specialize.'

Weather related differences do affect the operating conditions and the related reliability and availability. Operating in hot and sandy climate has a much different effect on reliability than cold and rainy weather. Services are also typically centralized and confounded with the long product development and high capital investment. The limited supply from three major global engine producers drives the limited opportunity for anything other than world demand in engine equipment, but the service aspect is less concentrated than the equipment itself. These points support the conclusion that there are limited barriers to global competition.

Global competition is coupled with industry structure to understand the performance effects within the industry. To understand the performance in the aircraft engine services industry, the analysis must be split between the replacement material and the provision of maintenance labor. Porter's (1980) five forces model helps to understand why the aircraft engine replacement material is highly profitable while the provision of maintenance labor is not. For material, substitutes are almost non-existent due to the technological lock-in that comes from planes that are tailored to operate a specific engine model. Changing engines is basically impossible. The high capital cost, long development and validation cycle, and steep learning curve make entry very difficult. Technological lock-in and systemic connections between the engine components along with intellectual property rights protection weakens supplier power. In addition, numerous buyers are legally required to maintain their engines leading to weak buyer power. The technological lock-in also limits the rivalry between the three major original equipment manufacturers (OEMs) once the engines are selected.

Despite these forces, third party generic material suppliers and rival engine OEMs with engine system competences have still entered as competitors for replacement material and repairs. This is particularly the case when an OEM dominates an engine model market. For example, the General Electric – SNECMA partnership, called CFM, dominated the regional jet market with the CFM56 engine (Yoshino, 1986). It was the only engine capable of producing enough thrust to take off and land on short regional airstrips, thus it had a monopoly in the short-to-medium range market class until competitive engines were produced by rivals. Pratt and Whitney and Rolls Royce

teamed up to develop replacement material for the CFM engines. Also, Pratt and Whitney, Rolls Royce, Japanese Aero Engines Corporation, Fiat, and MTU Aero Engines formed a partnership called International Aero Engines to design a competitive offer called the V2500 Engine. The rivals actively entered the replacement material markets when one gained too large of a foothold. In general though, the aircraft engine replacement material market is still quite lucrative (Crandall and Greenberg, 2012).

On the other hand, the provision of maintenance and overhaul labor is relatively low in profitability. Entry was costly but not prohibitively so. Airlines were required to maintain their engines and the airline industry had even lower margins than the maintenance services segment. This facilitated backward integration of the airlines. Multiple rivals increased competition and reduced profitability. Additionally, according to the continuous improvement manager, the supply side had two to three times the needed capacity which further increased the competition to overcome the high overhead costs. The provision of maintenance labor yielded relatively low profitability.

In summary, Aero faced global competition in the aircraft engine service industry. As an engine OEM, they faced only moderate competition related to replacement material, but much stronger competition for providing the full range of maintenance labor support. Also as an OEM, Aero gained legitimacy for future engine sales from taking on the operating risk of their products through long term service agreements. The complexity of the industry dynamics relative to the Aero business model provided for an interesting setting to understand business model responses to conflicting demands.

Institutional Context

National Regulations. The aircraft engine industry is highly regulated even with some deregulation that occurred in the past. A US Congressional study on deregulation of the airline industry noted (United States Government Accountability Office, 2006: 3),

> 'The airline industry has undergone significant change since the late 1970s. … Even with deregulation, the federal government continues to play a role in air commerce in a variety of other ways—from the Federal Aviation Administration (FAA), which oversees air navigation, safety, and airport investment; to the Department of Homeland Security, which oversees passenger security; to DOT, which oversees international agreements and has a mandate to protect consumers from unfair and deceptive practices in air transportation and its sale.'

Despite allowing market forces to dictate routes and fair prices, aircraft safety, passenger security, and consumer protection are critical mandates that are still undertaken by regulative agencies. Similar organizations are present in most countries around the world.

The regulation related to aircraft safety is the most critical element related to the Aero service model. The material, repair processes, and replacement practices are all regulated by the national aviation administrations. Greater risk of catastrophic failure due to a single part failure is associated with more stringent requirements for monitoring and controlling the part. For example, standard limits are set for a reasonable lifespan of certain parts that are critical to the operation of the aircraft engines to prevent potential failure. These 'life-limited parts' must be changed after the number of cycles (take-offs and landings) reaches the regulated threshold. Cycles are typically used regardless of duration of the flight because the most heat and pressure is

applied to the engine during the take-off and landings to overcome momentum. The remaining parts are monitored for cracks or potential signs of failure and changed as needed.

Due to the critical implications for both human life and asset security, parts are changed prior to actual failure. They are designed and tested to extensive degrees in order to limit the potential for failure. The design specifications are regulated, but not to the point that it limits the variety of technical options within those constraints. Engines and parts are tested and validated, but once they reach the regulated thresholds they are removed from the aircraft. Instead of discarding the parts and replacing with new, some parts have the potential to be reworked in order to be used again. This is what Aero calls the repair process. Each repair must also be tested and approved for use before they are used in actual passenger service again.

Each facility that performs work on the parts must be authorized by the regulative department of the customer's nation. For example, the Chilean airline authority (DGAC) must approve the original equipment and also the service facilities and related practices for work done on the planes of LAN airlines, the main Chilean airline. Each nation sets, monitors, and enforces their own standards, even when the manufacturing and service facilities are located within other nations.

These national regulations must also be continuously monitored through regular audits. For the most part, the audits are announced ahead of time and usually limited to the review of appropriate paperwork rather than actual substantive tests completed at the service sites (Crandall and Greenberg, 2012). The equipment manufacturers and

service providers establish regulative protocols to limit the risks of failure even when the national regulative boards are unable to audit every aspect. This enables fewer regulators to validate that the protocols are being followed which limits the need for the time- and resource-intensive testing of the actual equipment. There have been relatively few incidents or plane crashes in the last 15 years besides the regional operator, Gogan Air, which had a plane crash outside of Buffalo, NY, USA, in 2009 (Crandall and Greenberg, 2012). This is quite amazing considering the National Air Traffic Controllers Association estimate that there are more than 70,000 flights per day in the US (National Air Traffic Controllers Association, 2012).

Transnational Regulatory Standardization. Each nation has its own regulative administration and individually enforces those rules, but the majority of these are based on one of three starting points, the US FAA, the European Union's EASA, and China's CAAC. Because of this, there is a great deal of similarity between many of the national level regulations. Even these three hegemons are similar as they relate to the requirements for the engine service business model. Aero was undergoing an audit from a South American country aviation authority for the operations location in Europe that was servicing the aircraft engines. One of the Aero executives discussed the national aviation authority similarity and the related impacts on the Aero operations sites,

> 'They'll generally adopt the FAA or the EASA, but if you're going to take one customer, say we're doing this right now with a [South American] customer. We want to send [them] up [to the UK]. Then the [South American country] authorities have to qualify the shop [in the UK] as it meets the [South American country] regulations even though it has already passed FAA, EASA, Philippines, Australia, and everyone you could imagine. The [South American country] government needs to

> go and check them off as well, and they'll go up and do an audit. I'm thinking that because the FAA, CAAC, and EASA have already qualified them that it's a pretty easy qualification, but I just don't know. You need to do the formality of checking them off. Every country will go and qualify a repair site. I think each country just accepts responsibility for their own airworthiness of their airlines. An airline has to take responsibility for their own airworthiness and they do that through their own country.'

Because of the adoption of a few hegemons of aviation regulations, the demands on the Aero operations are relatively standardized with little variation expected from including more customers. Despite these similarities, the governance still remains at the national level which requires incremental transaction costs for each national authority to monitor compliance.

Not only are the global pressures for safety and the three similar hegemons of national aviation regulatory bodies driving transnational normative pressures, but many of the national aviation regulation administrations are working together to standardize their practices to promote safety and security across national borders. The US FAA has included practice sharing and implementation in general, and with China's CAAC in particular, as one of its top annual goals (Federal Aviation Administration, 2009). This collaboration constrains the variation between the national regulative systems and provides a regulatory basis for standardization.

Chapter Summary

In summary, the base business model provided a starting point that was supported by the sources of demands listed above. This initial case described the supporting influence of these demands in order to set the stage for the following cases to understand how the business model was adapted when the influences do not directly

support the existing model. The base model was very close to Porter's (1986) 'global' model with centralized operations and decision-making coupled with standardized technology and practices. This model was supported by several sources of pressures. Passenger safety was one of the most influential global demands. It was embedded in the stringent national regulations, the transnational standardization of national aviation regulations, and subsequently the technical development of the engines, replacement material, and repair and maintenance practices. This created significant pressures to develop a globally standardized product with strict and consistent routines. The massive scale necessary in developing and delivering the products and services supported centralization as a mechanism to gain cost efficiencies and also controlled the output to generate the necessary quality for continued safety.

In addition to the institutional, technical, and economic pressures above, industry structure and the structure of related industries also facilitated the global base model to compete with rivals across borders using similar models. The oligopolistic structure of the original aircraft engine equipment manufacturers (OEMs) was supported by contracts with the five airframers that locked in potential engine models to specific airplane models. The design and development costs of new planes and related engines limited rapid change in technology, yet the competition between the major OEMs continued to drive new continuous innovation over long (five to ten year) cycles. These pressures further supported the global base model.

CHAPTER 5

RESULTS: PATTERNS OF BUSINESS MODEL ADAPTATION

The base case above had multiple reinforcing demands and conditions which supported the existing centralized and standardized internal business model. However, Aero's service model was also subjected to several other demands which pressured the model for change. These other non-supporting demands were not necessarily in conflict with the base business model. Some demands pressured for its expansion in new directions while others directly conflicted with it. Aero also responded in different ways depending on the pressures. In this section, seven cases of non-supporting demands and conditions are considered along with the adaptation that occurred in the business model. For each case, the demands and related conflicts are first introduced and then the business model response is discussed. Table 5.1 summarizes the base model and a comparison of the seven cases.

Table 5.1
Summary of Multiple Pressures and Responses

	Base Model	Example 1a: LRUs	Example 1b: Financing	Example 1c: Fuel Upgrades	Example 2	Example 3
Multiplicity & Congruence	Congruence: support global, central model	Orthogonal: new direction from base	Orthogonal: new direction from base	Orthogonal: new direction from base	Conflict between segments creates internal conflict over metrics	Conflict between segments creates internal conflict over metrics, enables competitors
Value Proposition Options	-Full service availability and reliability of aircraft engines -Operating performance risk transfer - Standardized products and services	- Bundle LRU Service - Horizaontal Product Diversification	- Bundle Capital and Risk Transfer - Horizaontal Product Diversification	- Bundle Fuel Upgrade Products - Horizaontal Product Diversification	- Flexibility/Less is more: customers value option to do more themselves - Vertical Product Diversification: Selling internally AND externally	- Flexibility/Less is more: customers value option to do more themselves - Vertical Product Diversification: Selling internally AND externally
Organization	- Centrlaized operations location -Service Internal to firm boundaries - Centralized purchasing - Centralized decision-making	- Extend workscopes to include LRU review and replacement	- Risk Management Organization with Chief Risk Officer	- Extend workscopes to include fuel upgrade components	- Modular segmentation of base value chain X Reduced internalization - Layering (org values and informal structure, heuristics to explain the transition, and formal hierarchy) to balance competing metrics and align strategic goals - Controls to validate customer legitimacy & protect the core	- Same as Case 2 - Segmenting market and seeking customers with similar values for goal alignment - Partial ownership and long term contracts to protect the material core
Resources & Competences	- CORE = Technology: Replacement Material and Repair Processes & Design and Innovation Capabilities - PERIPHERAL = Labor & Capital	- Purchase LRUs	- Risk Management Capabilities and Capital Added	- Leverages existing design capabilities along with customer data to identify and deliver fuel reductions (new materials, software, part designs)	- Subtract resources needed when offer less of base model (balancing demand with resource utilization)	- Protect and expand the core through mutual agreements - Compete in peripheral segments of the value chain
Nature of Change	None	Expand	Expand	Expand	Reduce	Reduce
Degree of Integration	High	Low	Low	Low	Low	Low

Table 5.1 (continued)
Summary of Multiple Pressures and Responses

	Example 4	Example 5	Example 6	Example 7a: Trade	Example 7b: Accounting & Tax	Example 7c: HR
Multiplicity & Congruence	Conflict from increasing competitive capacity AND Orthogonal for Local Jobs	Conflict, credit risk perceptions	Conflict, Intellectual Property Rights Protection	Orthogonal, transaction costs	Orthogonal, transaction costs	Orthogonal, transformation costs
Value Proposition Options	- Local externalities (jobs & capabilities)	- Reduce offer from risk transfer full service to material management and overhauls as needed	- No offer	- No Change in Value Proposition	- No Change in Value Proposition	- No Change in Value Proposition
Organization	- Reorganize existing resources locally - Reduce internalization - Governance controls (partial ownership and long term contracts) to protect core - Layering to reconcile conflicting demands between internal and partners - Segmenting partners and seeking similar values for goal alignment	- Modular segmentation of base value chain X Reduced internalization - Layering (org values and informal structure, heuristics to explain the transition, and formal hierarchy) to balance competing metrics and align strategic goals - Controls to validate customer legitimacy & protect the core	- Organizational controls to validate core is safe	- Independent organization dedicated to compliance and the reduction of finanical and temporal transaction costs	- Semi-independent organization dedicated to compliance and the reduction of finanical transaction costs	- Semi-independent organization dedicated to compliance and the reduction of finanical transaction costs
Resources & Competences	- Protect and expand the core through mutual agreements - Compete in peripheral segments of the value chain	- Core was protected - Reduce resources to reduce risk	- Core protected through avoidance	- Local resources added to manage the local frictions	- Local resources added to manage the local frictions	- Local resources added to manage the local frictions
Nature of Change	Expand	Reduce	Reduce	Expand	Expand	Expand
Degree of Integration	High	Low	High	Low	Low	Low

Case 1: Expand to Meet Orthogonal Demand

The first example of non-supporting demands did not demonstrate conflict for the existing model, but rather an opportunity to expand the product scope. Several factors led to additional customer demands that went beyond the base model. First, the Aerospace industry in general is capital intensive. Long, expensive design, development, and testing cycles required large capital outlays early on for engine and plane production which were only recouped after long periods of commercial utilization that only started to occur more than 5-10 years later. This drove investment costs for planes up which increased the capital base needed for the airline customers. High capital asset costs required long periods of stability in earnings for repayment and reinvestment. To provide stability, the airline industry was highly regulated, including price-setting and route competition, until the late 1970's in the US and the 1990's in Europe (Crandall and Greenberg, 2012). Since the de-regulation, the airline industry had been relatively unstable leading to a thirst for capital slack to manage through the volatility which was demonstrated through multiple controlled bankruptcies.

In response to the increased competition from de-regulation, airline strategies split between specialization in transporting customers and backward integrating into the slightly more lucrative maintenance segment (Crandall and Greenberg, 2012). Aero engine manager 1 also confirmed this split,

> 'In it's basic form, there are two kinds of customers. There's the [customer1] Airlines model where they like to do everything themselves and there's the [customer2] model where they outsource everything. It's just a different philosophy. … They fly airplanes and they do it well and they outsource all their

> maintenance whether it's airplanes or engines or whatever it is. It's just their model. [customer1], they want to do every engine themselves.'

In this example, the demand for customer specialization is considered. Example two and three below offer more insights into the responses to customer backward integration.

When the airline customers wanted to specialize in flying and outsource all maintenance, that meant engines, planes, and everything related. Plane maintenance included the plane body, interior functionality, and control and landing systems. The commercial operations manager also noted that there was 'peripheral equipment around the engine that is not part of the engine' called 'line replacement units (LRUs)' which needed to be replaced.

These demands exceeded Aero's baseline business model scope of only engine services. However, the extended scope of demands created opportunities that Aero considered. Aero's response to the demands for capital and the strategic decision to specialize in flying led to several additional value proposition offerings. For example, Aero offered flexible financing. As Aero's commercial operations manager put it, 'you can pick your payment mechanism.' One option was to pay for each hour of service from the start to give stability in the cash flows needed for engine maintenance. Another option allowed for using the engines but not paying until it was time for actual service. This allowed airlines to hold onto their capital longer until the engines needed service. In addition to the flexible payment options, Aero also provided various insurance packages which also facilitated stability for the airline customers.

For customers that wanted to only outsource their engine maintenance, Aero leveraged the base model. However, Aero also offered maintenance coverage on the line replacement units which were directly connected to the engines. They also offered several additional value offerings. See Table 5.2 for a summary.

Table 5.2
Aero Product and Service Offerings

Base Model	Add-ons
New, used serviceable and repaired material solutions	Technology upgrades
Specialized repairs	Fuel and carbon solutions (consultation and/or software solutions)
Workscopes	Foreign object damage (FOD) coverage
Initial provisioning	Flight line line replacement unit (LRU) coverage/availability
Training	Digital Services
Tooling	Comprehensive remote diagnostics
Scheduled and unscheduled engine removals	Performance and trend monitoring
Logistics and material management	Coverage for service bulletins and airworthiness directives
Transportation coverage	Guaranteed spare engine availability
Engine wash	Engine and rotables sale/leaseback
Overhaul and Scheduled Maintenance Labor	Return condition guarantees
Operating Risk Transfer	Payment Timing Options

Expanding the product and service scope to satisfy the diversity of demands only helps to understand the change in the value proposition. The next question is how these changes were delivered to get a full scope of the adaptive response. The list of various offerings was split between the base model and add-ons. As noted above, the base model value chain spanned replacement and repair material through the operating risk transfer. The items in the 'Add-ons' column were additional to the base model. The first and second, 'technology upgrades' and 'fuel and carbon solutions' demonstrated a retro-fit of innovations developed for the new engine releases which could be implemented on the older engine models. 'Foreign object damage (FOD) coverage' and 'line replacement unit (LRU) coverage' were additional material around the engine which could be added as well. These offerings were an extension to the replacement parts and repairs and were delivered through the same channels and mechanisms.

The next three, 'digital services', 'comprehensive remote diagnostics', and 'performance and trend monitoring' were each extensions of the repair and maintenance tooling and processes. These services leverage existing competences that were currently used to deliver the baseline model along with additional data to leverage existing channels, resources, and organization to provide added value. As noted by Aero's website, this set of services

> 'combines our engine design and analysis expertise with the trend and fault data available from most of today's aircraft systems to coordinate and deliver real-time operational support. With the ability to continually monitor aircraft and engine information, [Aero] can spot issues before they become operational problems.'

The remaining value add-ons were essentially financial and insurance offers that created flexible financing options for capital stretched airline customers seeking

stability. These offers varied the use of capital, but did not change the base model. The capital element was essentially an integrated banking component that was relatively disconnected from other aspects of the business model.

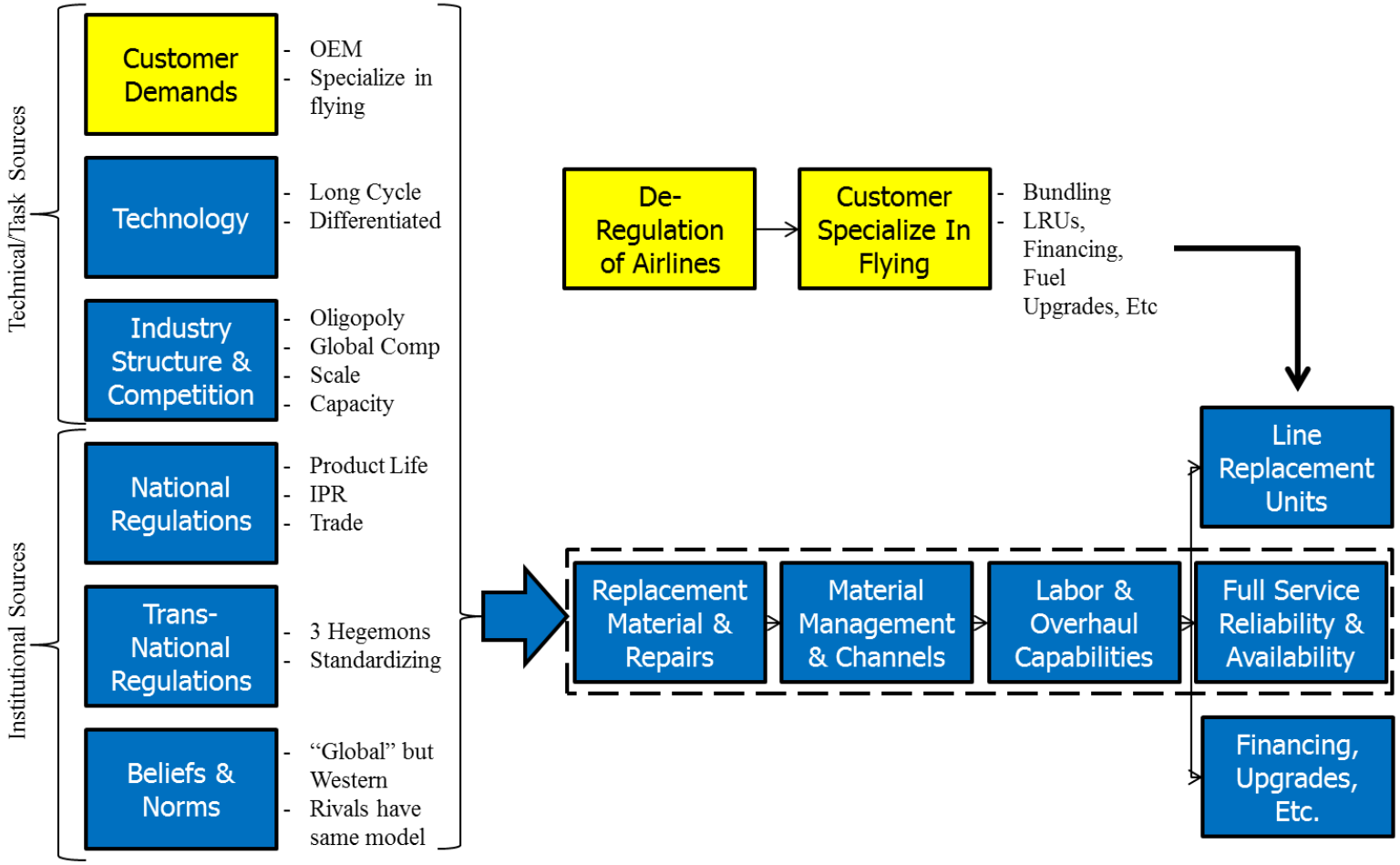
The demands for capital and expanded maintenance and diagnostic services did not cause a conflict for the existing business model. Instead, they offered Aero additional opportunities to expand the value they offered and captured by leveraging existing elements of the business model that did not require additional changes to the internal model. Aero used the 'modularity' adaptation lever noted by Ghemawat (2007:116). Modularity enabled a business model to satisfy a diverse set of demands by maximizing the possible combinations and limiting the specialization of the connections and the need to integrate tacit knowledge (Kotabe, Parente, and Murray, 2007). Each of the offerings noted in this example were incremental to the base model and were added with relatively minimal change which particularly leveraged the existing organization of resources to deliver new value propositions in addition to that of the base model. The incremental resources and competences were bundled to create value for the customer through scope of services management. These incremental resources and competences were internalized when they overlapped with other Aero-parent business models but were otherwise purchased. For example, engine leasing was internalized because capital was a critical resource of the base engine model and the competences overlapped with other business models offered by Aero's parent organization. Line replacement unit (LRU) material was purchased since the resources and competences

did not overlap with those of the engine, however, the management of that offering overlapped with the existing parts delivery channels.

These added offerings were incremental to the main service offering and were unlikely to be connected to other elements of the business model. For example, variation in payment options was only connected to the timing of capital resource flows. The cash resources were not directly connected to the other components and thus enabled multiple value propositions to be supported without changing the type of resources or the organization of the business model. Offering LRUs leveraged existing material management capabilities, but was not connected to other components. The modular value offerings were related to the core business model option in a way that can enable bundling benefits without requiring significant changes at the interface of the segments.

Case 1 demonstrated that additional value could be created by leveraging existing resources and organization. Also, the interconnections between components could be simplified through upfront design coordination that enabled variation in the outcomes that satisfied multiple demands. This strategy worked to support adaptation of the end value proposition, particularly when the adapted modules were peripheral. See Figure 5.1 for a diagram of the modular model and related effect. The lack of interconnections allowed multiple solutions to be interchangeable and supported horizontal product diversification. Also, the horizontal product diversification did not detract from the existing business model and thus did not create conflict or generate added risk for the base model.

Figure 5.1
Case 1: Expand To Meet Orthogonal Demand



Case 2: Backward Integration from End Users

Extending the discussion from Case 1, de-regulation led to increased competition between airlines and volatility in the airline industry. As noted above, this drove some airlines to specialize in flying and others to internalize the slightly more lucrative engine maintenance work which they relied upon to continue flying. Prior to de-regulation, the airline companies were not permitted to service their own engines. This was supposed to stop airlines from cutting maintenance costs to maintain earnings. With de-regulation, the airlines were allowed to service their own engines if so desired. For the most part, most airlines wanted either an external servicer which was discussed in Case 1 or they wanted to do all the work themselves through backward integration.

This backward integration essentially created competitors for Aero's base business model in two forms. First, end users competed with Aero for their own portion of the overall engine maintenance market. In effect, end user airline customers that did their own maintenance were competitors of Aero, but only on the slice of the engine market that they owned. Only these customers will be considered in this example. The second form of competition came from customers who internalized the maintenance process for themselves and also competed directly with Aero for other airline customer service deals. This second form will be considered in Case 3 below. In addition, Aero could not block competition because national anti-trust regulations required Aero to provide at least replacement material to their engine customers.

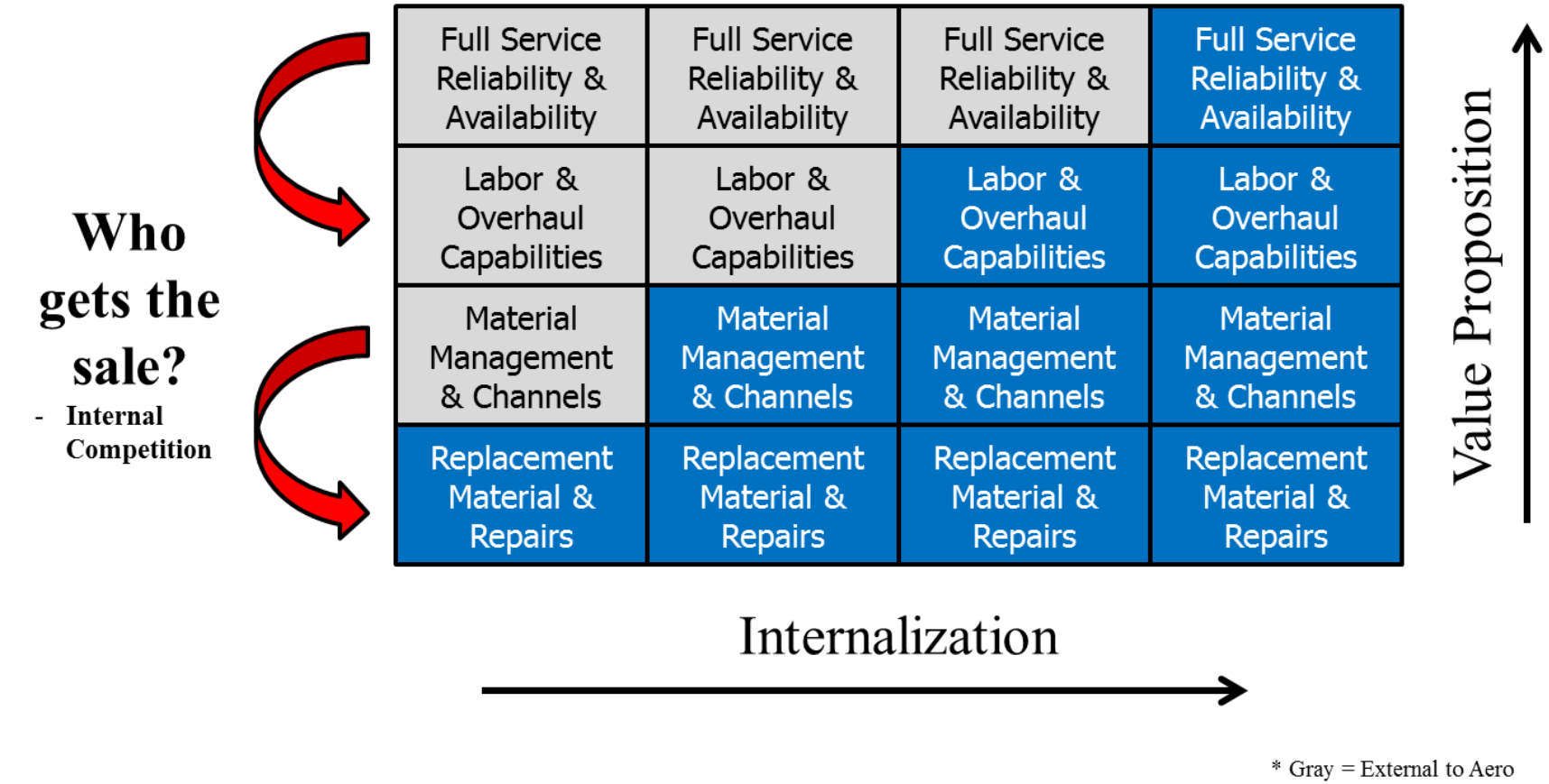
When the end user was considered, further competition was not part of the decision process. However, meeting the demands of end user customers that internalized their

own maintenance work still created conflict for Aero's base business model. The base model offered full service overhauls, but the airline consumers demanded only part of the base model. This provided incentives for Aero to use the 'focus' lever noted by Ghemawat (2007: 116) rather than providing the full service. However, the consumer demands for OEM service and related legitimacy provided by a willingness to take on operational risk noted in Case 1 conflicted with this type of scope reduction. Aero's base model was situated between conflicting consumer demands and was also limited by regulations which prevented monopolistic retaliatory actions.

To respond to these conflicting demands, Aero offered different segments of the value chain as value propositions for external sale which created vertical product diversification. To manage the organization of this external response, modularity was used to limit the internal connections between stages and allowed for value offerings to be provided at each progressive step. Case 1 used modular connections to add onto the base model. Here in Case 2, this adaptive lever was used in conjunction with decreasing degrees of internalization by allowing the customers to internalize more of the value chain as demonstrated in Figure 5.2 below. In this example, the value proposition was the full service of the engines required to meet national regulative flight standards and remained essentially constant. The set of elements that built up to the full service offering were segmented to allow them to be sold separately or included in a more extensive value proposition. Depending on the degree to which the customer wanted to backward integrate, different value propositions were then offered. At one extreme, the customer manufactured or acquired their own parts, managed the inventory,

serviced their own engines, and took on the operating risk for the engines. At the other extreme, customers outsourced all of this work and specialized in air transport as seen in Case 1. The modular organization used enabled co-existing value propositions to meet the various demands and limited the variation needed within the business model.

Figure 5.2
Modular Value Chain and Vertical Product Diversification



* Gray = External to Aero

The Aero website also relayed this concept of variation in demands and the resulting increase in value propositions, 'We realize there is no such thing as a one-size-fits-all plan. So whether a customer is looking for a comprehensive overhaul or they have their own shop and want us to provide the materials, [Aero] offers a choice of flexible features.' Table 5 above lists the various value offerings and describes how the products and services are offered. This was confirmed by the commercial operations manager, who stated,

> 'It is variations on a theme. I would also say [our service offering] has building blocks. So one building block is what we call 'base overhaul' which is simply the engine comes in, we'll fix it. We can add to that a spare engine while your other engine is in the shop. Would you like us to take care of some of the peripheral equipment around the engine that is not part of the engine. We call them 'line replaceable units (LRUs)'. Services such as diagnostics, we can provide that for you. Where things get more customized is in the payment schemes. You can pick what is covered and you can pick your payment mechanism.'

The 'base overhaul' was split further into material solutions ('parts'), material management, specialized repairs, workscopes, labor, and risk transfer. An engine must be maintained to meet high safety and regulatory standards. The base overhaul was the constant value proposition noted above which was adapted through a modular value chain to be sold both internally and externally. The other 'variations on a theme' were discussed in Case 1 as peripheral add-ons to the base model which were selectively added as incremental modules. Both forms of modularity were used to satisfy external demands, but the interaction of modularity and internalization led to internal competition.

Internal competition was formed when each value proposition was pitted against the others. Aero wanted to sell Parts, but they also wanted to deliver full service

overhauls. This created conflicting incentives internally because to gain in one channel meant to lose in another. The channels of delivery to the customer were coordinated in order to avoid the conflicts. The conflicting demands created a strategic paradox for the business model that had to be managed (Smith, Binns, and Tushman, 2010). The multiple value channels were each seeking growth and performance, particularly as the CEO had stretched their annual deliverable metrics beyond the foreseeable path.

As a secondary response to deal with this internal conflict from segmenting the base business model, organizational layering was created to identify and balance conflicting demands. Organizational layering is informal or formal hierarchical governance above the level of the conflict which is invoked to balance the demands. Both informal and formal were present in combination in this Aero example. Informally, a customer support manager (CSM) navigated the demands of the customer and balanced them with the pressures of the segmented channels. This was supported through the 'customer-centric' organizational values advocated by the company which empowered the CSM to balance most disputes. The drive for growth and performance also provided a heuristic to suggest when more formal hierarchy needed to be leveraged to resolve a conflict. One manager notes,

> 'What we do is set thresholds in the organization as to what you approve. A [high] % deal goes through, [middle] % deal needs more people to look at it. [low] % deal you need to call in lots of people, [Aero Services CEO] on up. Why are you doing a crappy deal?'

Flexible layering enabled conflicting demands to be balanced while still maintaining overarching strategic direction and goals.

Each value proposition in this example still retained the core material value offering as well. Parts and repairs were sold to the customers along with incrementally increasing value segments. As long as the replacement material was purchased from Aero, the remaining value segments were available for external sale. Without it, the value capture was insufficient to maintain the offering unless forced to do so. For example, Aero acquired a service provider that had long term contracts for Aero and rival engines. For the competitor engines, the material was purchased from the competitor. , The margin rates on these contracts were extremely low because the core was not included. Aero attempted to exit these contracts but was forced to continue them until the term was completed. Including the material core was a critical component for Aero to enter into long term contracts unless they were pre-existing contracts that were purchased and not possible to exit.

To protect the replacement parts core, controls were put into place. First, qualification routines were established to verify that a prospective customer was a legitimate end user. One engine model manager explained,

> 'They have to get endorsed or validated to buy parts from us. We're not going to sign a simple GTA (General Terms License) for people to buy parts to a fly-by-night guy who puts in PMA. So we're going to do our homework. We're going to say yes this is a reputable business, you can buy parts from us. … There is a clearing house at the AOC (Aviation Operations Center). Somebody calls in or emails in and says I want to buy these parts. Someone will send them a form to fill out. There may be a charge, there might not be. Then once it is approved, they'll get a GTA. It's a simple agreement with terms on the back that say you have the right to buy these parts. We endorse them. We don't have a store. We have a warehouse that will process orders for reputable customers. … We would check do you really have a plane, how's your credit, you might have different terms, you might have to pay cash in advance.'

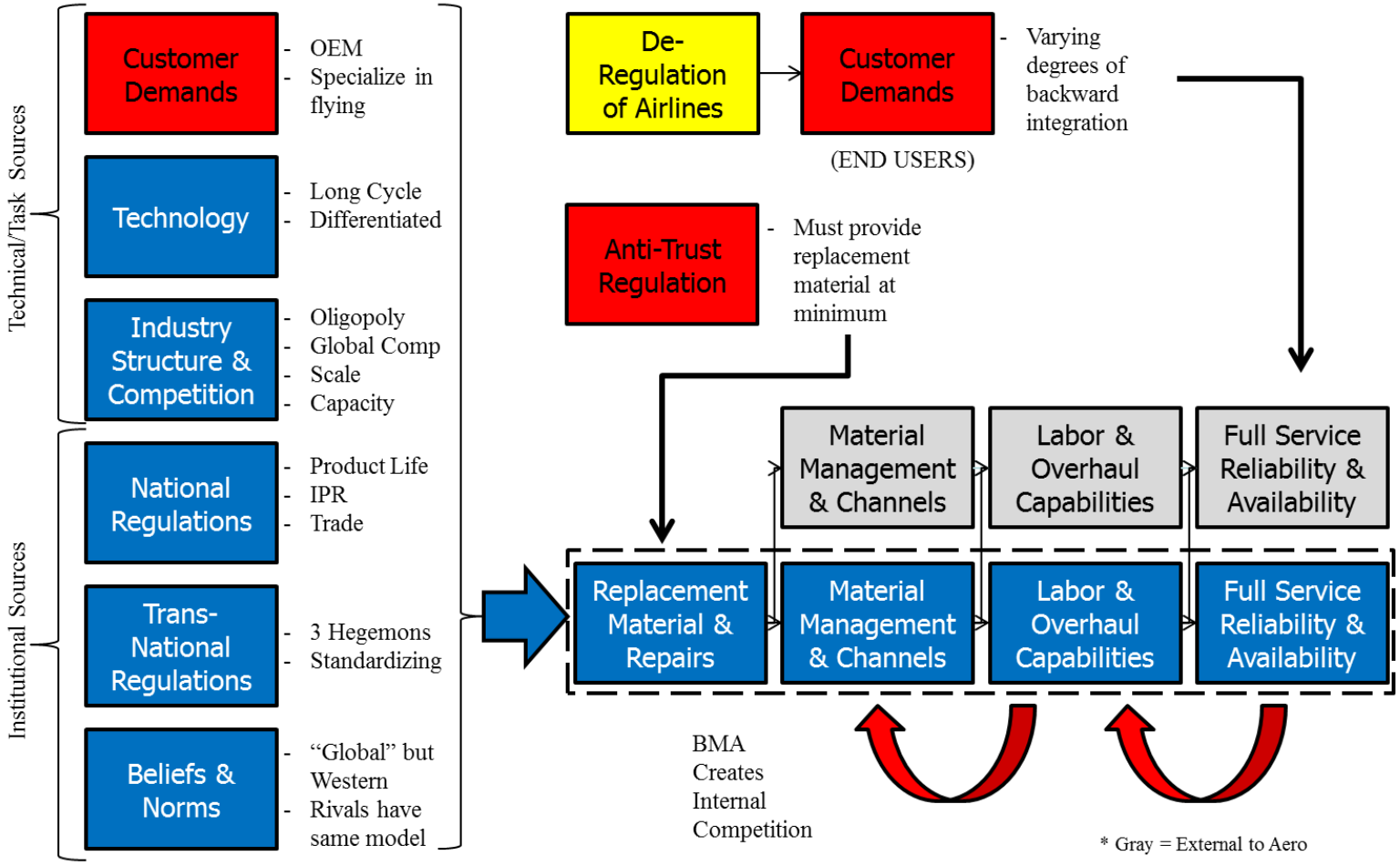
The pre-sale validation increased the potential for the Aero managers to isolate end user customers from those that are potentially going to use generic material, re-sell the material, or copy the material as generic imitators. Though it did not completely eliminate the potential for rival action, the validation at least verified that the customer at least owned Aero engines.

Second, Aero segmented its market based on similar values to align strategic goals. The commercial operations manager noted, 'We are looking for customers that are looking for more than just price.' Aero was seeking a market segment that values Aero's differentiation strategy as opposed to a cost leader strategy (Porter, 1986). Differentiation mechanisms such as OEM quality were more likely to be valued by these customers than by airlines who were simply seeking cost efficiencies. This restricted the use of generic material (and potentially service) providers and protected the material core of the Aero business model. The customers who had matching values were actively served and supported while those that did not perceive added value from OEM material did not get extra support. Aero actively supported customers who had similar values which drove goal alignment and increased competition for those who did not align with those goals.

In summary, when faced with variation in the degree of backward integration by airline customers, Aero provided a variety of service options by segmenting the value chain into modular components that were sold independently so long as the core was protected. Figure 5.3 shows a diagram of the model adaptation. Aero protected the core through validation mechanisms and seeking similar values through market

segmentation. Selling multiple value propositions across the value chain prevented significant changes in the organization and resources to meet the demands, but created internal conflicts that needed to be managed. The internal conflicting demands were balanced through organizational layering of informal and formal governance.

Figure 5.3
Case 2: Backward Integration From End Users



Case 3: Backward Integration From Competitors

Further extending Examples 1 and 2, Case 3 considered increased consumer demands from airline customers who backward integrated and competed for future overhaul and maintenance work. Case 1 demonstrated consumer demands for specialization which included the demand for the base model along with additional offerings that enabled airlines to focus on flying. Case 2 extended this example in the other direction as Aero supplied airline customers with different stages of the base value chain which allowed the customers to do their own work. Case 3, considered here, showed that Aero also faced consumer demands from airline customers that backward integrated and directly competed with Aero for service work from other airlines. For example, Delta Tech Ops, Lufthansa Technik, and other airlines maintain their own fleets, but also maintain the engine fleets of several other airlines across the globe. This creates external competition for Aero and the other jet engine OEM providers.

The Strategic Management literature would suggest that rivals will take retaliatory actions to construct entry barriers and restrict competition (Porter, 1980). Government intervention may limit those retaliatory actions to those deemed appropriate, e.g. anti-trust laws limited Aero from restricting replacement material sales to engine owners. However, Aero could have slowed the entry of these customer-competitors into other aspects of the service market by reducing the amount of information available related to the repair and replacement process. In spite of the potential to increase competitive

transaction costs, Aero proactively supported competition. For example, the large type engine manager noted,

> 'Basically, if you develop a repair and someone else tries to copy it or do their own approach, that would be a DER. … If [an airline customer] were to pursue DER, we wouldn't endorse them and it becomes a fine line because [one airline customer] is a classic example, they have a mixed fleet. They are time and material (T&M) but they are also long term accounted [service agreement] for certain portions of their fleet. And they bid against us. So they are a customer but they also do their own work and they bid on the open market for third party overhauls. So they could show up at [another customer] … and have a proposal and they'll be bidding against [Aero]. And yet we'll be helping them on repair discounts, material discounts to make them more competitive.'

Anti-trust regulations prevent engine manufacturers from blocking customers from doing their own work, but typically customers need knowledge and support to develop the resources and competences sufficient to meet the regulated standards for the engine maintenance. The large type engine manager further explained,

> 'You have a value chain of licensing along the way. … You do that because there are a couple of reasons. You can't block people from being in the business because there are anti-trust issues. But at the same time, you have the right to regulate how much help you give them. Everybody in the world has the right to do [Aero engine] overhauls. However, none of them have the right to be endorsed by [Aero]. That's our choice. They could go buy their own tools, their own license, train their own mechanics, whatever it is and they can get in the business.'

Aero could use the scale and knowledge barriers associated with aircraft engine services industry to limit entry. Instead, they support certain customers to enter the market anyway.

Supporting customers to become competitors may make sense if the focal model implies exiting the service industry or segmenting it to eliminate competition within segments. However, Aero has continued to internalize maintenance service with new long-term internal contracts. Also, the transnational nature of the industry prevented

significant market segmentation since engines could be flown anywhere in the world to be maintained. Aero was neither exiting the service model nor segmenting the market to restrict competition.

It may make sense to see the support of competitors when the firms are working together for innovation called 'co-opetition (simultaneous pursuit of collaboration and competition)' (Gnyawali and Park, 2011). This was occurring with the design of some engines, but not in the service model. For example, the V2500 engine types noted above was a partnership between Pratt and Whitney, Rolls Royce, and others. GE and Pratt and Whitney teamed up on the GP7200. Similarly, the Trent 1000 engine series was a collaboration between Rolls Royce, Kawasaki, and Mitsubishi, and GE and SNECMA partnered for the CFM engine series. These partnerships demonstrated the co-opetition noted by Gnyawali and Park (2011), however, Aero also actively supported service competitors that did not supply knowledgeable insights for innovation or better efficiency in maintenance. The knowledge flows were one-directional from Aero to partner servicers, so co-opetition was not driven by collaborative innovation here.

Additionally, the relative performance of providing the service was not high. Several managers had commented that, 'We don't make money on labor.' For the same reasons as Case 2, Aero had pressures to exit the maintenance market but needed to provide service for their own engines in order to maintain legitimacy for their engines. In addition, Aero also faced demands for value segments from competitors.

Instead of actively seeking to reduce competition or exiting the value chain segment as the Strategic Management literature would suggest, Aero supported the entry of

competitors and also still internalized all stages of the value chain. This clearly generated conflict for the base business model. The need to continue to maintain the internal OEM service value proposition suggested that Aero would have maximized their presence in that market through competition and natural entry barriers. However, Aero was supporting direct competition. They sold modular value segments of the business model which enabled competitors to enter at various stages of the value chain depending on their capabilities.

Isolation through market segmentation was only partially possible. Ghemawat (2007: 116) suggested that 'partitioning' can reduce the costs of adaptation by allowing variation across zones, but limiting it within. Geographic subdivisions were not possible considering the global nature of the engine technology and service operations. The engine services industry was global as Aero and rivals provided services for countries across the world (Porter, 1986). Aero was unable to segment the offering of services regionally because the variation in demands crossed regional borders. Airlines in each region had full service contracts internalized by Aero. In addition, economies of scale support a centralized, global model.

Instead, Aero partitioned the value chain in order to protect the replacement material core while allowing allowing for competition for labor services. The conflict was managed without jeopardizing the competitive advantage. However, the segmentation required governance controls such as long term parts agreements or joint venture ownership to assure protection of the material core. The conflict was managed internally as Aero decided which overhauls were sent to partners and which were kept

internally. Also, competition was supported for partners that displayed similar values and protected against those that did not.

In summary, the combination of these demands generated co-existing value offerings through a modular value chain with varying degrees of internalization. Internal conflicts were created which were managed along with external competition. As in Case 2 above, these issues of co-existing business model options were balanced through informal and formal governance layers which identify and balance conflicting pressures to prevent what Pache and Santos (2010) describe as organizational breakup or stagnation. Segmentation of the value chain also enabled the core elements to remain internalized while the peripheral was leveraged to balance conflicting demands. Some form of control was retained to protect the core elements especially when the peripheral elements were directly related to the core. The material core was also protected through the search for shared values. The Aero large type engine manager noted,

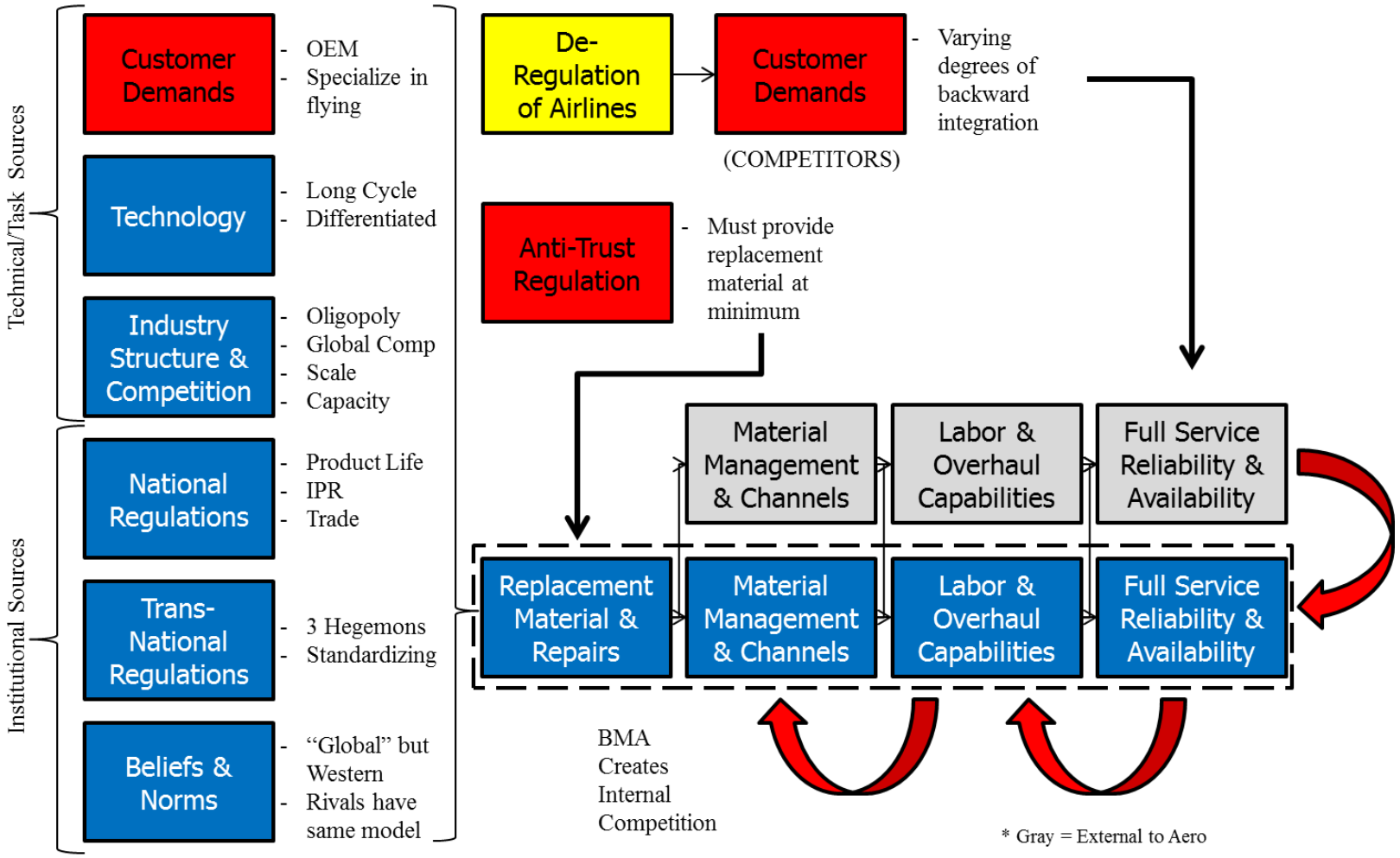
> 'We're trying to put support locations around the world, but also align with people that have the same values as us. So therefore, I can look a customer in the eye and say I don't have problem sending your engine to [our MRO partner] because we have the same values.'

Similar to above, shared values enabled alignment of the strategic goals of both Aero and the partner-competitor. Strategic alignment was critical for Aero to enable competitors.

The modular solution demonstrated in Case 2 was the same as in Case 3; however, instead of serving end-user customers, Aero knowingly supported future competitors. Aero segmented the value chain which guaranteed the material core was protected

even when competition was present in the service labor side. Relational partnerships were established based on similar values and strategic alignment. See Figure 5.4 for a summary of the pressures and adaptive responses related to Case 3.

Figure 5.4
Case 3: Backward Integration From Competitors



Case 4: Backward Integration for Local Jobs

The fourth example extended Case 3 by considering additional support that was offered to the competitors. This 'co-opetition' was facilitated by the drive for jobs and capabilities in the airline customers' home countries. Backward integration of the airlines noted in Case 3 was a possible option, but not necessarily required. Some customers demanded OEM service, but also wanted the work done in country to leverage the experiential learning to develop local capabilities. Those in Case 3 may have also been influenced by the potential for retaining jobs and capabilities, but did not seek further support than access to earlier stages of the value chain than the full service offer.

Porter (1980) noted government laws and regulations as a source of protectionism against global competition. In many cases the airlines were owned by the government so direct influence was likely to balance the agenda of national jobs with that of cost efficiency. The commercial operations leader noted that the governments typically only formally specify the number of planes, but 'jobs matter.' Local production or maintenance was not stipulated by policy, but the opportunity for local maintenance created a significant pressure.

The source of those demands was not necessarily regulatory, but was assumed to be some form of 'nationalism or patriotism.' Maurer et al. (2011) explained that resources are given additional value based on their cultural setting. Here, the use of local human resources exacted additional value. For some customers, government ownership directly impacted the mandate for local jobs. For others, the connection was much less

clear, but the demand for local jobs was sufficiently strong that several Aero executives with direct interaction with customers and their demands took notice. Table 5.3 summarizes the comments made by several Aero executives.

Table 5.3

Jobs and Capabilities Matter

Source	Quote
Commercial Ops Manager	Well China wants shops in China, India wants to make sure they have maintenance capabilities. Maintenance shops provide jobs. Jobs matter.
Engine Manager 1	Then there is such a thing as an EOSA (Engine Overhaul Service Agreement). That's where you are actually helping them develop capability and overseeing their capability and capacity in their shop.
Finance Manager	One European contract states that we want X% done in Europe. [Why?] I don't know…national loyalty or regional loyalty. [It's not a regulation?] No. All the shops are FAA regulated to perform the overhaul on that engine. It's a matter of I'm a French airline, I want it done in Europe.
Engine Manager 2	I think that the local airline one does treat their shop as a P&L and they need to keep some labor in there to keep their base up [for overhead scale]. I think the pressure to create local jobs is huge and they expect [Aero] to participate in that.
	I think you would get pressures for jobs anywhere but the US. I think in Europe it takes an act of god to lay some folks off. Thailand they just don't want to let people go. Taiwan they don't want to let people go. I don't know if it's a government policy that you're not allowed or it's just a local airline policy, I don't know what level, but there's definitely a more broad spread desire to job security and maintain jobs at global sites, at our customer sites. So like KLM, EGAT (shop for Eva airlines in Taiwan). It's interesting because EGAT is on one side of the airport and you walk across the street, it's not even across the airport it's across the street, to a competitor, China Airlines. They fly the same engines and they overhaul the same engines. So it's incredible inefficiencies, but they want to keep their folks employed. If they were really driven by shareholder value, they'd cut that out. Same thing in Japan, they've got Japan Air and ANA who both have fully functioning MRO shops that are right next to each other. Rather than consolidating and getting some efficiency, they need to keep their folks employed.
	There's probably some government policies on spurring growth, maybe in the emerging markets trying to create the middle class and that there's a working base there to do that.
	I think the service product in places like India and China we do support the local shops which helps differentiate a service product.

Table 5.3 (Continued)

Jobs and Capabilities Matter

Source	Quote
WishTV.com	One of the city's largest employers announced Tuesday it's expanding and adding needed jobs. Rolls-Royce announced a $42 million project that will create 100 new jobs.
Rolls-Royce press release	"I am thrilled Rolls-Royce is expanding its presence at the Stennis Space Center and constructing this new test stand in Mississippi," said MDA [Mississippi Development Authority] Executive Director Leland Speed. "Rolls-Royce is a valued member of the Gulf Coast's – and the entire state's – corporate community, and I am grateful this leading company is continuing to invest in our state and create additional high-paying job opportunities for Mississippians."
TheManufacturer.com	In the face of difficult global economic conditions, GE has continued to invest in technology and jobs at GE Aviation Wales. By investing in strong talent we will ensure that GE Aviation Wales continues to offer a world-class service.
BBC UK News	What we have here is a skills base so it is very important that we maintain that... by having really well trained people
Office of the Georgia Governor	"These new manufacturing jobs will allow Pratt & Whitney to remain competitive and viable in the global engine overhaul market while keeping jobs in the United States and better serving its long-time customer, the United States Air Force and its large C-17 fleet located in Charleston." - Pratt & Whitney President David Hess "Columbus is very fortunate to have a great corporate citizen like Pratt & Whitney," said Columbus mayor Teresa Thomlinson. "They continually support our community, providing excellent jobs for our citizens."
Yoshino (Ch. 16, pp. 517-8 in Porter 1986)	"Governments have a major stake in the industry for a variety of reasons. Aircraft production is an embodiment of high technology with large spill-over effects in a variety of industries; it is a close linkage to national defense. Moreover, it can provide substantial exports. For example, the aerospace industry accounts for about 8 percent of the total exports of the United States and 6 percent of the United Kingdom. Moreover, in most countries, airlines are owned by the government, which can and does exert considerable power in equipment decisions."

The localization of jobs and capabilities did not by itself imply conflict. A standardized model could have been applied in each location (Winter and Szulanski, 2001). The standard organizational model was essentially what was created through the consistent workscopes, repair processes, and transferred practices. The conflict came from the mixture of economies of scale present in the engine service segment and the extensive overcapacity present in the industry. The technology used for a single engine

model was globally consistent. The capital investments were extremely high and the engines were mobile relative to the cost of the overhauls (about 2%). In addition to high pressures for centralization based on the economies of scale, the continuous improvement manager and the large engine type manager both noted that the industry had about two to three times the capacity demanded. These forces generated strong pressures for centralization that conflicted with the localization demands for jobs and capabilities. Aero's base model contended with these conflicting demands.

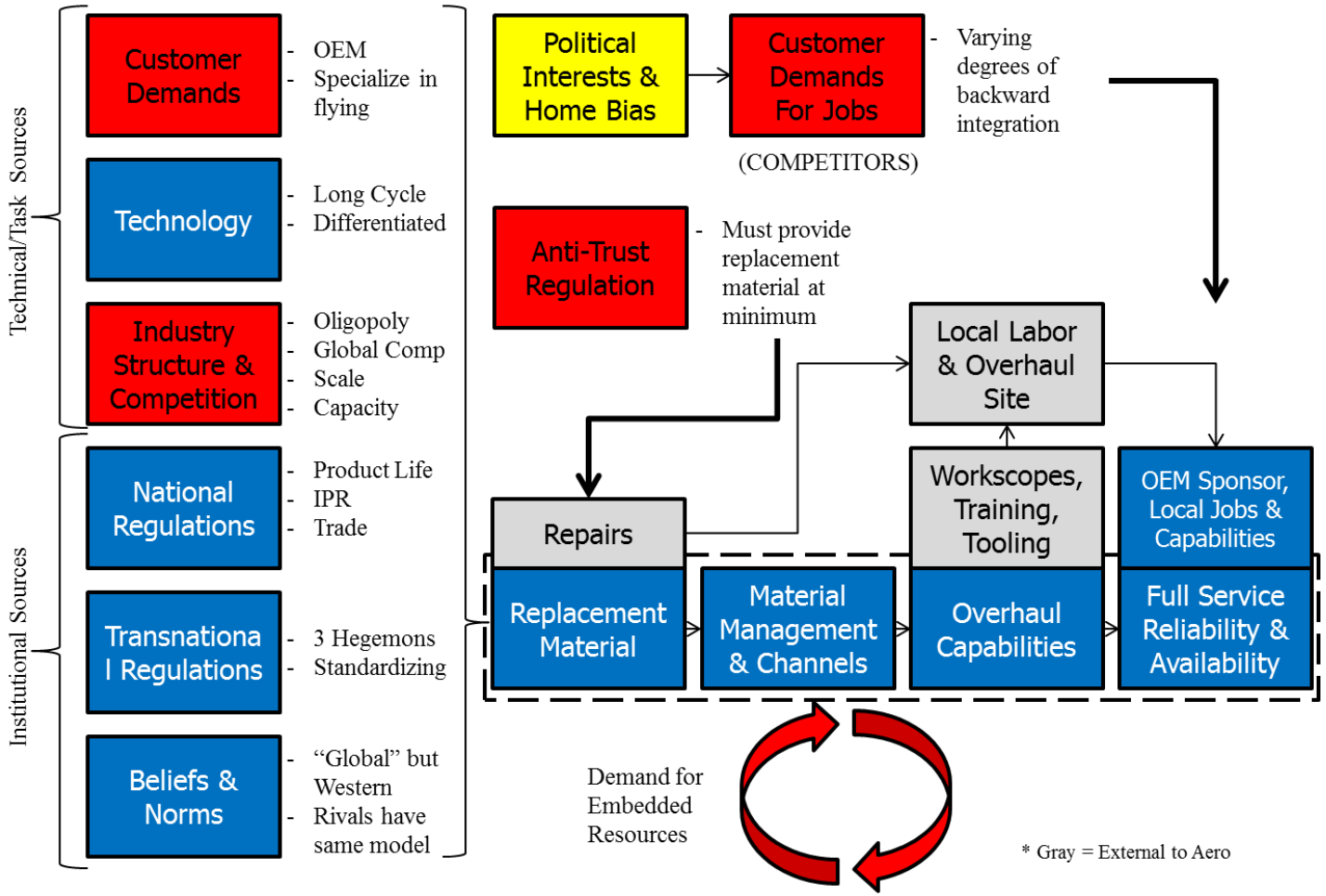
Aero's response to these conflicting demands not only created competitors through the modular value chain as seen in Case 3, but they also created competitors by selling knowledge, providing training, and granting guaranteed overhauls. The modular aspect simply allowed competitors to decide how much they wanted to internalize (typically through backward integration of the value chain by airlines). Modularity segmented the value proposition offerings. However, Aero also reconfigured the organization to offer resources and competences which were embedded within the modular segments. The knowledge elements of the value chain which can be represented in the form of 'workscopes' or 'repair capabilities' were provided for sale. In doing so, Aero captured part of the value created from using localized resources and selling its capabilities.

Co-existing value propositions were created through the internal, Aero-provided service options and the new organization of resources and competences that generated additional value through local externalities. Resources and competences that were normally organized into the full service business model were reconfigured to deliver the full service offering along with local jobs and capabilities. Using local resources mixed

with Aero's knowledge created local capabilities. This localization was also mixed with the centralized, global model. Some of the contracts leveraged both internal Aero service offerings along with guaranteed local overhauls. Others required a full localized partner. In each instance, the internal model competed with the local models that are both supported by Aero through codified workscopes, experiential training, and online and/or on-site support.

The conflict of creating competitors was then managed in the same way as above in case 3. The overlap between these offerings allowed Aero to satisfy further variation in demands while it isolated and balanced the internal conflicts. Aero leveraged the existing organizational layering and controls to manage the conflict and protect the material core. Aero supported competitors when it modularized the base business model value chain and also when it reconfigured the base model elements in combination with local resources to create and capture incremental value. Aero also sought to align strategic goals between themselves and their maintenance, repair, and overhaul (MRO) partners also noted above in Case 3. Figure 5.5 shows the model of reconfiguration and the related conflicting demands.

Figure 5.5
Case 4: Backward Integration for Local Jobs



Case 5: Nested Institutional Contexts and Credit Risk

Aero operated long term service contracts with customers from their home country and also from 72 countries around the world. Long term service contracts essentially form a risk transfer agreement where the operating risk is shifted from the airlines who own and operate the planes to the engine servicer. Each time the engine needs a part replaced or repaired, the engine is typically removed from the plane and sent to a repair shop. In a long term service contract, the number of times the engine may be removed is estimated for the life of the contract. Since it is a forecast, there is risk that the actual operating performance will not match the estimate. This is considered to be operating risk. Long term contracts were then essentially a mixture of warranty and maintenance services.

In addition to the operating risk, Aero offered payment terms that led to financial risk. The typical life-cycle of an aircraft engine started with a phase of general maintenance with repairs and replacements occurring as required. After the major components reached certain regulated thresholds of wear or had undergone the maximum number of cycles (take-offs and landings), the engine was scheduled for an overhaul. These overhauls were extremely expensive and created large bubbles of capital outlays in a short period of time. To offset these cash flow concerns, airline customers would pay a certain fee per hour of use that covered all costs throughout the contract. Costs and associated revenues built up for Aero which were offset by customer payments. Over the life of the contract, the revenues would equal the payments received. At various points during the contract, an imbalance of timing

between the expenses incurred and the payments received created risks or opportunities for Aero depending on the direction of the imbalance. This generated financial risk, particularly if the customer did not pay on the contracted schedule.

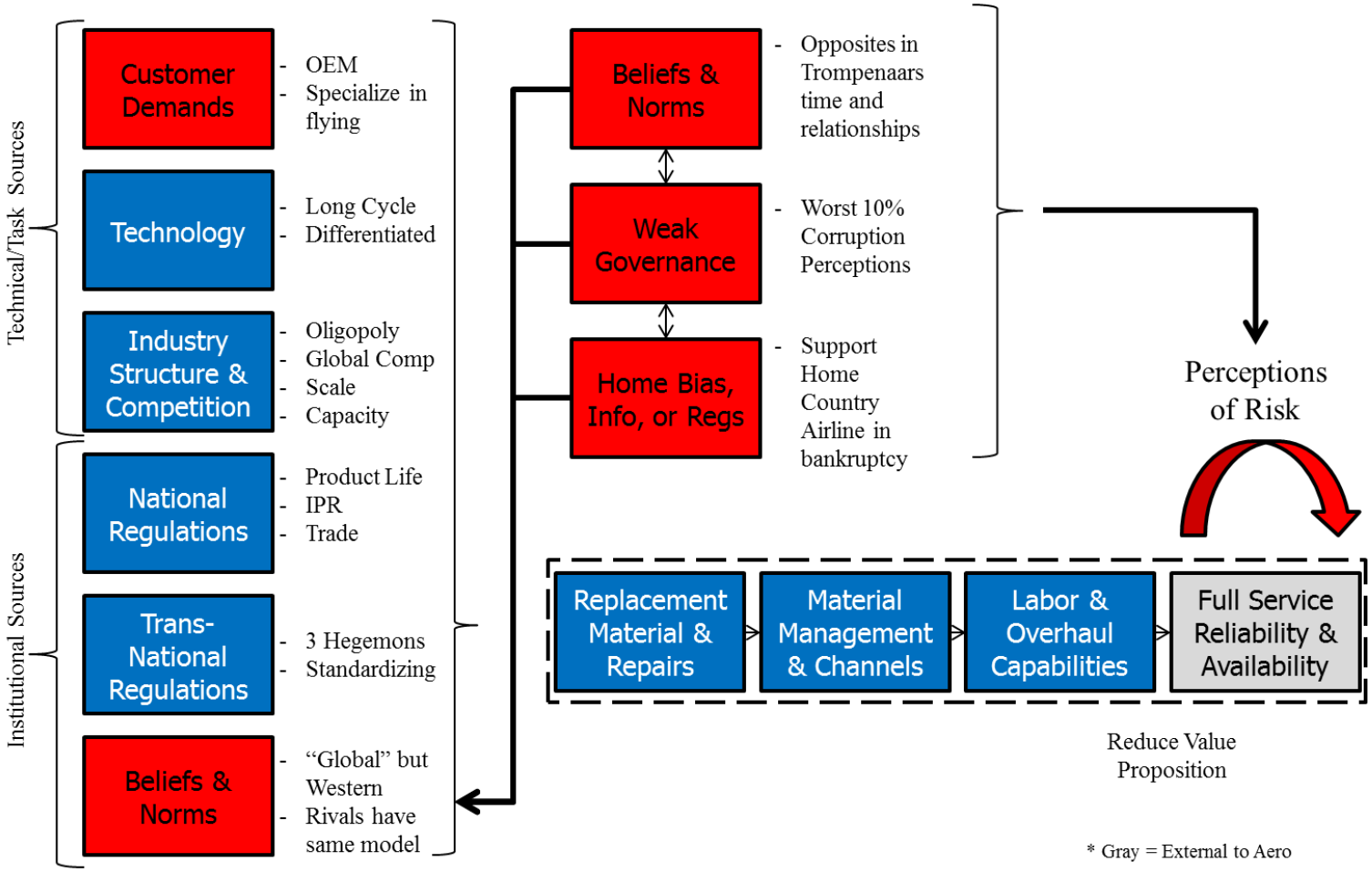
For this example, the impacts of conflicts between home and host perceptions of legitimacy were explored. At home, Aero had a long term service contract with an airline customer which was struggling through bankruptcy. They were unable to pay their bills on time and thus needed to enter under legal protection to restructure their debt obligations. Similarly, Aero also had a long term service agreement with a government-owned African airline. The government-backed airline customer also struggled to meet the contractual obligations at the prescribed time. The government was not in bankruptcy, but rather was plagued by a country operating environment of perceived corruption for which it was considered by Transparency International (2009) to be in the worst 10%.

In the case of the home country airline in bankruptcy, Aero viewed their financial distress as legitimate and were considering increased involvement to support the airline. The finance manager that was discussing the issue noted, 'Are we going to let [home country customer] go out of business, probably not.' The bankruptcy was seen as a consequence of industry structure and macroeconomic volatility which was too much for a single airline to manage (see also Crandall and Greenberg, 2012). On the other hand, Aero viewed the lack of timely payment from the African customer as an illegitimate outcome. Despite a global financial crisis and cultural influences that suggest a loose handling of time constraints and a tendency for relational forms of

contracting in the African country (Trompenaars and Hampden-Turner, 1997), the stark differences between the home and host values drove distinctly different perceptions of legitimate causes of payment delays. In addition, the stark cultural realities were nested within extremely different environments for global governance. The African customer's context ranked in the bottom 20 percent of the world governance indicators compared to the home country customer who operated in an environment that was consistently in the top 10 percent. The different perceptions of payment delays were compounded by the institutional environments in which the customers were nested.

Differences in values and governance contexts influenced Aero to reduce their value offering to eliminate the conflict from the African customer while increasing or maintaining the full service offer for the home country customer. The long term contract with the African customer was ended and transitioned to a reduced offering that shifted the operating risk and financial risk back to the government-owned airline. Conflicts in values were much more difficult to segment or isolate since they permeated the cognitive frames used to evaluate situations and decide on actions (Scott, 1995; Swidler, 1986; Kraatz and Block, 2008). Because of this, the internalization of the value proposition was reduced to a level that mitigated the risk associated with differences in perceived legitimacy. The risk affected collections and financing, but not the intellectual property that supported the replacement material core. Aero used a modular response similar to Case 2 and flexible financing from Case 1 to eliminate perceived risk but still maintain support for the customer. Figure 8 shows the conflicting demands and how the modular base model was leveraged to reduce perceived risk.

Figure 5.6
Case 5: Nested Institutional Contexts and Credit Risk



Case 6: Weak IPR Protection Countries

This example of multiple demands and conditions for Aero's cross-border business model considered the implications of intellectual property rights (IPR) protection. The Aero base model was constructed on knowledge embedded in technology and material. The core of the service business model was the material parts and repairs which were patented and protected by IPR regulations. Aero estimated the rule of law regarding proprietary information prior to entry. The commercial operations manager noted,

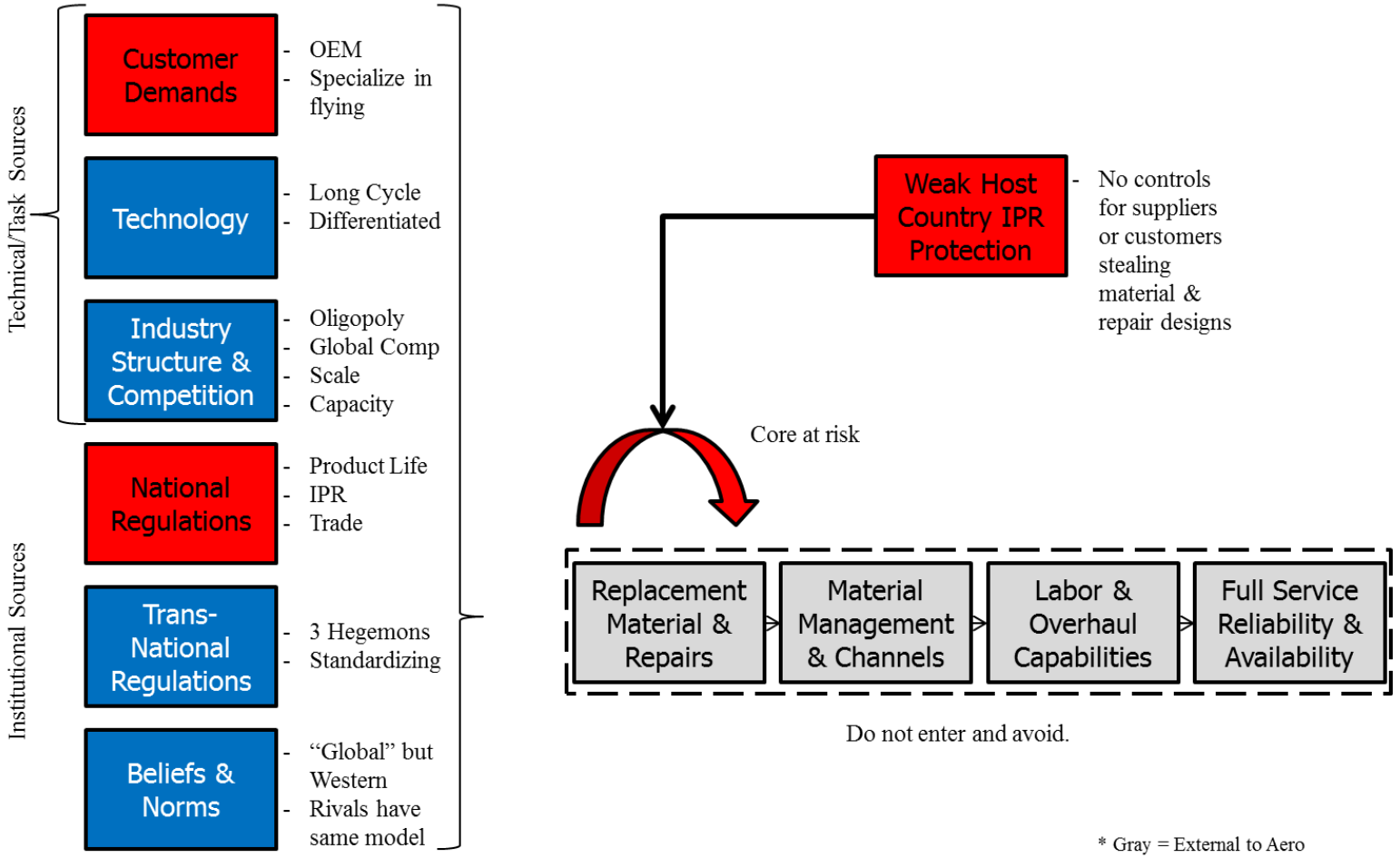
> 'We have lawyers in [HQ] and legal teams around the world to make sure our technology is protected. We wouldn't go into build a shop where we weren't comfortable with that. … It doesn't come into the pricing as far as I've seen. It's an on/off switch. You either have the protection or you don't. If you don't have it, it's a no go. You don't price for it in a riskier environment. I feel comfortable doing business or I don't and if I don't we won't do business. We don't do that in our industry.'

The Aero base model maintained airlines' engines from 72 countries. The nature of the base model, however, enabled these engines to be extracted from the weak IPR regulatory environments and serviced in other countries. The concern came from the location of critical component production and service. These locations were internally managed across five countries, but offered in nearly 20 external Maintenance and Repair Organization partner locations around the world. Again, this created conflicting demands for Aero's base business model.

In response, Aero formed organizational controls to protect the material core. It organized locally knowledgeable resources to verify that intellectual property rights were not likely to be violated. The parts and material core was supported by intellectual property laws that enable Aero to capture value from the high investment costs for

developing the innovations. Losing the knowledge assets created from the systemic interactions between material components along with the material specifications themselves would have undermined the value of Aero's core. Since knowledge is a common good, once it is known control is lost. Aero avoided situations where the core was endangered. Figure 5.7 demonstrates the conflict and resolution.

Figure 5.7
Case 6: Weak IPR Protection Countries



Case 7: Institutional Differences Require Local Resources

The final example of multiple demands and conditions compared the Aero base model across national settings. The Aero base model was centralized and standardized for a given engine type essentially based on output power. For example, a small plane needs less power to fly, so it would have smaller engines that put out less power. Larger planes would have larger engines. Aero, however, supported a range of plane sizes with multiple engine types which were serviced at five internal locations in five different countries, but each type only had one internal service center thus making it a centralized model. Each engine type also used a similar centralized, standardized global model allowing for comparison. Comparing across internal service centers, and thus across engine types, allowed for analysis of national differences. The national differences that emerged related to the operational locations were primarily related to international trade, accounting and tax, and human resources.

The international trade regulations were significantly more complex and integrated in Brazil than the other locations such as the US, UK, and Canada. This increased monetary and temporal transaction costs. For example, when asked what in the external environment created barriers for the way Aero operated, the large type engine manager noted,

> 'Shipping stuff, going through customs, being able to move things around. If someone says to ship an engine into Brazil, ok but it's 2 wks to get something through customs unless it's cleared. You have roadblocks in customs in importing and exporting and things like that. … Then you'd try to set up a process so you'd have relationships with the government customs people. You have to have special processes because you have designated people to deal with this day in and day out. You use special freight companies that have agreements. There are a lot of things that we deal with although agility is one that we deal with every day.'

To manage the trade complexity for places like Brazil, Aero created an international trade compliance group to formalize special processes and oversee that regulations were not violated ranging from training on hand-carrying material to licensing across borders. They also used freight expediters that were able to establish relationships with customs officials and develop specialized practices to facilitate transfers. This 'agility' issue was managed through a group that worked in conjunction with the existing base model to mitigate the conflicting conditions. The specialized practices did not change the base model, but were added to it to ensure 'flexibility' which Ghemawat (2007: 116) identified as another sub-lever for adaptation.

In addition to international trade, customs varied from country to country. The large type engine manager also noted that the cultural customs generated challenges as well,

> 'Time zone differences. Arguably getting the right people together. I tried to talk to the Emirates VP today and they're 9 hrs ahead. They have a different work weekend. They don't work Friday/Saturday, but they work Sunday. Saudi works Saturday and Sunday and they don't work Thursday/Friday. You've got different work patterns, you have different holidays. Just communicating becomes a challenge.'

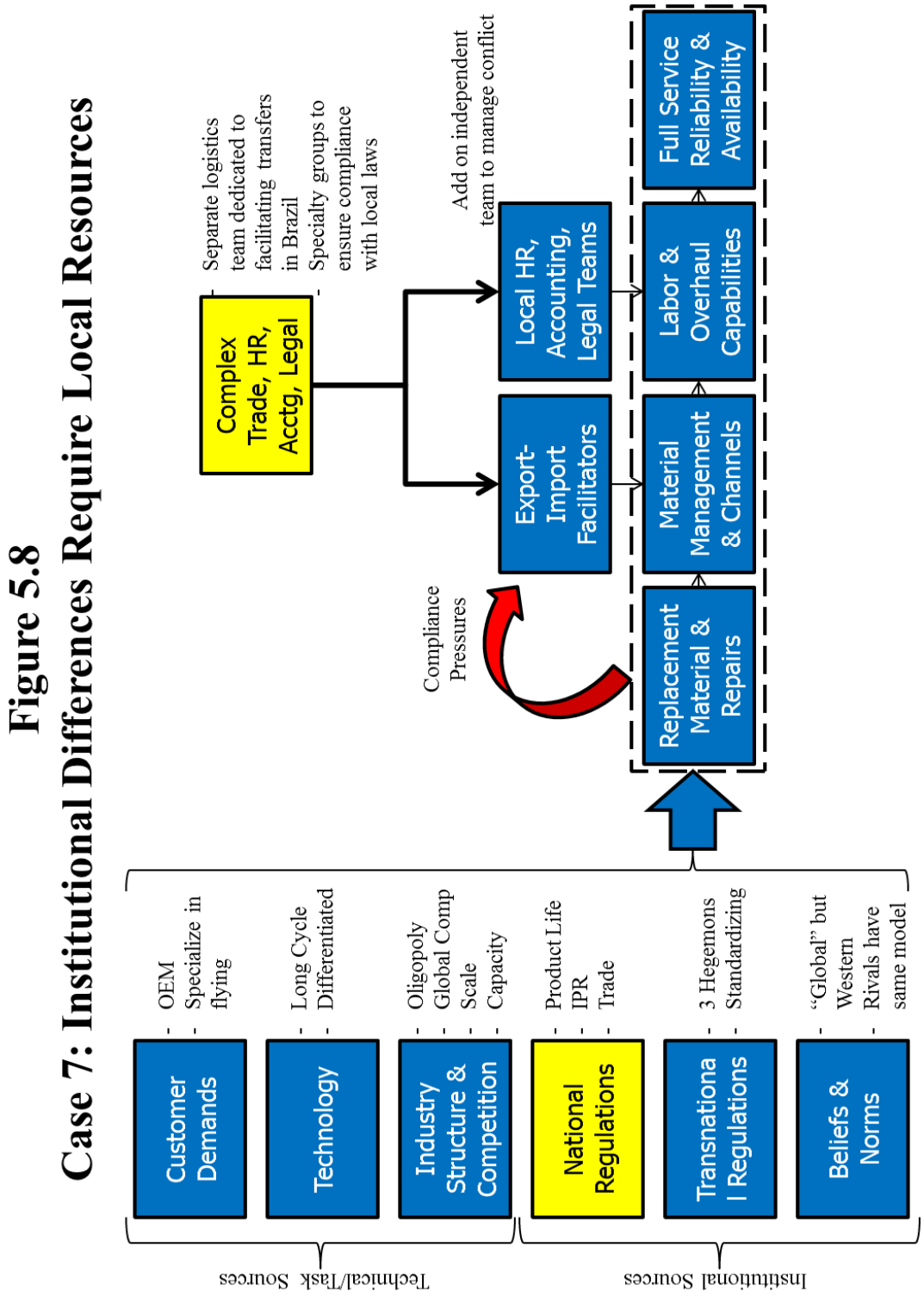
These conflicts generated from cultural differences were absorbed by managerial bandwidth and flexibility as managers were available at off hours to align with customers and foreign operations, i.e. conference calls late at night or on-call situations to meet customer needs. Aero also provided flexibility for the managers to work from home as long as government classified information was not removed from the company premises. Again, these changes did not affect the base model, but rather added operating practices to manage the complexity in the operating environment.

Other similar variation was triggered by accounting and tax laws. According to the Aero service finance manager and the continuous improvement manager, the global operations were tracked and managed with US dollar (USD) functional currency. This provided operating consistency for managing and metrics and limited foreign exchange risks to translation and taxes. A separate set of accounting books however were kept using local currency and accounting principles to meet local regulatory requirements for taxation and reporting. Local accountants and tax lawyers were hired to ensure these institutional demands were satisfied, but also to maintain the load of USD functional transactions for the operation as needed.

The accounting also incorporated provisions for local human resource regulations such as employee pensions. For example, the UK had significantly higher pensions than labor from Brazil and Singapore or even the US. This variation in human resource requirements was also managed locally as were variances in work hours and hiring and firing policies. Local managers were kept in place to manage the employees and remain compliant. However, the technical workscopes and practices were not changed and remained standardized.

The trade complexity, customs challenges, and variation in accounting and human resources regulations each created orthogonal pressures for Aero's base business model without necessarily creating a conflict. They each generated compliance risks which needed to be managed. In each situation, additional independent teams were added to the base business model to ensure regulatory compliance and facilitate optimal

operation. None of these teams were integrated with the other elements of the business model. Figure 5.8 demonstrates the incongruence and resolutions.



Chapter Summary

The seven examples described above from the Aero case provide a unique insight into the array of conflicts and opportunities generated from pluralism of demands and conditions. Aero responded differently to the conflicts which provided a range of variation in their strategic adaptive responses. In Case 1, Aero leveraged its existing resources and organization to offer horizontal and niche value propositions. Similarly, Case 7 showed independently organized additional resources to manage regulatory compliance. Examples 2, 3, and 5 demonstrated their modular split of the value chain. In Case 4, Aero extracted embedded resources and combined them locally to generate a new supplemental value proposition. Finally, Case 5 and 6 each showed how managing risk, particularly in protecting the material core, was of utmost importance for Aero.

CHAPTER 6

THEORY BUILDING AND EXTENSION

The examples given above provide several responses from Aero's cross-border business model which was subjected to multiple pressures relative to the base model. The demands stemmed from a mixture of institutional, competitive, and technical forces on the base business model. Different strategic responses were observed, however, cross-case comparison (Yin, 2009) shed light on some general themes. A typology of business model adaptive responses is put forth in this section and a related framework to assess the external influences follows. Propositions are offered regarding the strategic adaptive responses and the characteristics of the related external demands.

Typology of Business Model Adaptation

The typology is a generalization from the existing examples which provides insights into the likely response of a business model as it encounters multiple pressures and demands. The typology stems from an interaction of the nature of change to the base model (expanding or reducing) and the degree of integration (low or high). See Table 6.1 below for a summary of the cross-case comparison.

Table 6.1

Cross-Case Analysis for Dimensions of Adapative Response

	Description	Nature of the Adaptation	Degree of Integration
Example 1a	Line Replacement Units (LRUs)	Expand	Low
Example 1b	Finance & Insurance	Expand	Low
Example 1c	Fuel upgrades	Expand	Low
Example 2	Backward integrated customers	Reduce	Low
Example 3	Backward integrated competitors	Reduce	Low
Example 4	Backward Integration for Local Jobs	Expand	High
Example 5	Nested Institutional Contexts and Credit Risk	Reduce	Low
Example 6	Weak IPR Protection Countries	Reduce	High
Example 7a	Institutional Differences - Trade	Expand	Low
Example 7b	Institutional Differences - Accounting	Expand	Low
Example 7c	Institutional Differences - Human Resources	Expand	Low

The first pattern that is visible is the nature of the adaptation. Examples 1, 4, and 7 each expanded the base model. Case 1 and 7 are split into three sub sets for more

clarity and to demonstrate the range of demands. Case 1 added business model components in several ways. First, line replacement units were offered to customers as part of an overhaul package. This required additional material and technical direction. Second, financing and insurance offers added capital and risk transfer that required internal risk management capabilities, so a risk management organization was added as well. Third, fuel upgrade products were added based on customer operating data and design and development capabilities. Case 4 also added new value propositions of training, workscopes, tooling, production capacity utilization, and local jobs and capabilities. Case 7 added local knowledge and related organizational components such as a trade compliance department to facilitate export and import transactions, statutory accounting groups to maintain local financial reporting, and human resources to ensure that practices meet local regulatory and cultural demands.

Not all examples expanded the base model. Examples 2, 3, 5, and 6 each showed a reduction to the base model. Case 6 was an extreme example where the base model was not offered at all when weak intellectual property rights protection jeopardized the technological advantage embedded in the replacement parts and repairs. Case 5 also reduced the value proposition that was offered from the full service, operational risk-transfer offer to only material management and as-needed overhauls. Examples 2 and 3 each showed that Aero offered reduced aspects of the full base model to varying degrees. The parts and repairs were offered alone or in increasing combination with material management service or overhaul service up to the full base model.

The examples showed a split in the nature of the change, but they also showed diversity in the degree of integration. Examples 1, 2, 3, 5, and 7 each showed loose coupling. The Line Replacement Units, financing and insurance, and fuel upgrades from Case 1 were each segregated from the base model but were easily added through modular overlap. Similarly, in Case 7, the trade compliance and local accounting resources only had a connection to one part of the value chain without further connections to other components. The human resource group was more integrated since it required a connection between the practices and the workscopes, however, the technical elements of the workscopes remained consistent. The local HR group thus was still relatively isolated from the other aspects of the business model. This allowed Aero to be locally responsive while also technically integrated. Examples 2, 3, and 5 demonstrated loose coupling between the different stages of the value chain. The internal modularization allowed for each stage to be offered for sale both internally and externally.

Not all changes to the business model leveraged loose coupling. Case 6 showed that risk to the replacement material core led to a complete reduction of the offer. The core was too deeply integrated across all the value offerings to enable adaptation to occur through loose coupling. Case 4 was an example of embedded resources which were connected within the value chain segments. Aero extracted them from the base model, but recoupled them across borders through Maintenance and Repair Organization (MRO) partnerships. The adaptation was connected to the other segments of the business model generating integration.

The examples provided in Aero showed that business model adaptation is not a single simple response. Types of adaptive responses were demonstrated based on the expansive or attenuated nature of the change and whether the change is loosely coupled or integrated. Figure 6.1 shows the two-by-two typology which arose from the sub-cases above.

Figure 6.1
Typology of Business Model Adaptation

Nature of Change	Degree of Integration: High	Degree of Integration: Low
Reduce	**Avoidance** - Resist, Defy, Retreat or No Entry **Case 6**	**Segmentation** - Vertical Product Diversification - Modularity **Case 5** **Cases 2 & 3**
Expand	**Reconfiguration** - Extract, Reorganize, Reconnect **Case 4**	**Appendage** - Incremental offer or isolated response - Modularity **Cases 1 & 7**

The first type of response is called ‘Avoidance’ which is when the base model is attenuated to the extreme such that it is not offered due to the highly integrated nature

of the core. The base model is still highly integrated and offered where the IPR protection can be controlled by extracting the engines to a centralized repair location with stronger regulatory enforcement and/or restricted firm access. This is a strategic response because Aero was aware of the demands but chose not to meet those demands. Similar to the responses to institutional pressures noted by Oliver (1991), this type of response would encompass both 'avoid' and 'defy'. Aero avoided risks associated with weak intellectual property rights protection (Case 6) and defied available demand that was considered too risky (Case 5).

'Segmentation', the second type of business model adaptive response, also reduced the base model, but did so through loose coupling between the value chain segments. Examples 2, 3, and 5 each used this type of adaptation to manage the set of demands. The base business model was broken into modular segments that could be sold off separately generating vertical product diversification[5], i.e. external sales of different stages of the value chain. The full value chain was still maintained internally to support the demands that generated the base model, however, each stage of the overhaul process was also provided to meet the multiplicity of demands. Since the modular stages needed to be done to deliver the base model, added features were not needed to deliver the business model adaptations.

[5] Vertical product diversification is not backward or forward integration. Vertical product diversification is when the different stages along with value chain are segmented and sold to external customers and internal to the firm. Most concepts of vertical product diversification usually are based on internal selling and integration within the firm and/or selling to niche markets which are more horizontal or supplemental than vertical selling. Aero sells externally to customers and competitors. Sub-case 2 is also not a case of make and buy (see Parmigiani, 2007) since Aero is making and selling not buying. Sub-case 3 could be considered both make and buy, but to meet conflicting demands rather than the explanations discussed by Parmigiani (2007). Despite this new case of make and buy, the focus is on the adaptive response of the business model system rather than only the decision to make and/or buy.

The third type, 'Appendage', was apparent when the base model was expanded through loose coupling. Several examples demonstrated this type of business model adaptation. Case 1 showed that the line replacement units were added onto the base model which provided bundling services to airline customers. Different types of financing were offered which gave financial flexibility to cash-strapped airline customers. In Case 7, Local tax and accounting, human resources, and trade facilitation teams were added as needed based on cross-national differences between similar business models (i.e. engine sizes). All accounts of the appendage showed only limited connection into the business model and provided a relatively isolated linkage. Each of these examples was added onto the existing business model to meet the various demands without changing the base model.

The fourth type of adaptive response was 'Reconfiguration'. Similar to the 'Appendage', this example showed some added resources, organization, and value propositions, but with the 'Reconfiguration' response, these were integrated across the value chain. Some elements of the value chain that were previously embedded within the base model were pulled out and reorganized locally to generate a new value proposition[6]. Case 4 provides an example of this type when the repairs, workscopes, tooling, and training were each naturally embedded within the labor and overhaul stage

[6] Reconfiguration can generate a fully new value proposition and value chain. The Aero case showed that it generated a second value chain pathway from re-integrating previously embedded resources within a new local context. Technically, reconfiguration could wipe out the original base model or work in conjunction with an Appendage to form a new value chain pathway that co-exists with the original. The concept of reconfiguration however is based on extracting embedded resources to be reused, potentially with added resources, and integrating them back together to increase value. At the extreme, the base model transitioned to the reconfigured model and at the minimum a secondary value chain pathway is created which increases either the value created and/or captured. The latter is when the existing resources are reconfigured to simply capture more value, outsourcing or offshoring is an example.

of the value chain. They were transferred from the centralized location to various local shops which provided jobs and capabilities and linked back to the rest to maintain the base value proposition of reliable and available engines.

'Reconfiguration' constituted additional features for the business model and integration across the value chain because the organization of the knowledge resources and tooling changed but were still connected to other stages. However, it is an interesting type since it extends Brannen's (2004) concept of 'recontextualization' to the resource and competence level. Brannen (2004) showed that Disney provided a unique value proposition without actually changing anything because they were able to offer Japanese customers a glimpse of American culture in addition to some thrilling rides and theme park consumables. Aero was able to 'recontextualize' the knowledge resources and tooling without changing them by simply transferring them to local shops and workers. This also supports the idea of standardized localization and extends the concept of a multi-dimensional value space for a given resource (or set of resources) that generates relatively long lasting arbitrage opportunities. Thus, the full value constellation (Yunus et al., 2010) must be considered.

This typology above provides useful insights into how companies adapt their cross-border business model in response to multiple environmental demands. When the business model is considered as a set of potentially interactive components, adaptation may occur through the four adaptive responses. 'Appendage' may be used to maximize the base model while meeting the external demands and conditions through loosely connected additional resources. 'Segmentation' allows the base model to be loosely

connected internally in order to offer reduced portions of the base model to meet the multiple demands. However, when loose coupling was not possible because of pressures on the highly integrated material core, 'Avoidance' was the response. 'Reconfiguration' was the most complex response as existing resources were reorganized with additional inputs and then reconnected within the value chain which expanded the value constellation. These responses can be used independently or in combination.

Causal Framework for Business Model Adaption

In addition to the typology of strategic adaptive responses, the case also provided insights into typical drivers for each of these choices. In this section, the cases are analyzed for causal patterns that lead to each type of adaptive response. The first area of influence is risk management. The construct was present in several discussions and was relatively prominent within the Aero case. In Case 6 when the core advantage was considered to be at risk from weak IPR protection, Aero used 'Avoidance' of that type of environment. Aero rejected solicitations for local repair and overhaul work that could put the repair and replacement technology at risk of imitation. They extracted the engines to centralized locations that were considered to be controlled and safe. The potential impact of losing control of the technology that generated the majority of their profits generated a high risk.

Aero actively resisted operating in such environments. When asked if Aero priced higher to increase the returns relative to the risk, the commercial manager said 'no' and

considered risk to the material technology to be an 'on/off switch.' Protecting the core is critical for the immediate deal, but also for the future sustainability of Aero. Pricing could help to increase risk-weighted returns, but only so long as the core was protected. This seemed to be contradictory to the statement made by one of the engine managers that noted a deal approval heuristic based on estimated contract performance. Higher performance deals would have less scrutiny and require only lower level approval than lower performance deals. Taking this statement on its own might suggest that the core could be put at risk if sufficient returns were estimated. On the other hand, the engine manager may actually be taking the protection of the core for granted. Analyzing further, the commercial manager and the risk officer were part of each deal review prior to approval which served as a baseline control mechanism for the core. Value capture is important, but only if balanced with long term risk management by protecting the core.

In Case 1, Aero increased its risk by offering financing, long term operational risk transfer, and insurance. They added a risk management organization that was split into two stages: pre-deal signing and post-deal signing and execution which were matched with specific MNC-wide policies for each stage. The organization and capabilities were required due to the risk transfer value proposition that allowed Aero to maintain credibility for their engine quality. It was added onto the base overhaul model and was managed alongside the finance organization since it was only loosely coupled to the delivery of the base overhaul service. The risk organization also managed the financial risks associated with disconnect between cash flows and receivables over the long term contracts. Large deferred receivables could build up at certain points in the contract

term even if the net receivable balanced to zero by the end of the contract period. This drove significant financial credit risks, particularly for airline customers who continually operated at a loss.

Building on this risk organization 'Appendage', Aero extended operational and financial risk transfer in Case 5. These risks were assessed to be low due to government backing for the state-owned airline. However, 'Avoidance' was leveraged when the added credit and operating risk was coupled with untimely payments because the perception of credit risk increased. In addition, the high corruption perception ratings in the country also facilitated an image of excessive risk and demonstrated a misalignment of values and related goals. In that case, Aero reduced the offer to transfer the operating risk and financial risk back to the customer who was not paying according to the letter of the contract. Aero utilized the base model and continued to offer material management service and overhauls as needed without offering the financing 'Appendage' or the risk transfer 'Segmentation' of the value chain. The high level of perceived risk led to a reduction in the value proposition to manage the risk level. The material core was left unchanged suggesting that it was not at risk, yet an 'Avoidance' response was taken to reduce the perceived risk from differences in values[7]. Thus, this is another example of high risk leading to 'Avoidance', however, the degree of reduction was lesser since it affected a loosely coupled 'Appendage' or 'Segmentation' component.

[7] Protection of the core and alignment of values and goals may be interchangeable. Protecting the core may be a goal that is highly valued or similar values or goals may align but unwittingly put the core at risk. The decision model places the core first because each Aero sub-case demonstrated that the core was protected or unaffected otherwise the demands were actively avoided.

In the other cases, risk was still present but to a lower degree. Examples 2 and 3 enabled and Case 4 created competitors, however, the core was protected through long term parts sales agreements. Thus, the risk was managed through a control mechanism that maintained the majority of the economic value capture internally for Aero. The competition was occurring over a low value segment since Aero was not making the highest margins on overhaul labor. Case 7 demonstrated the potential for compliance risk which did not change the existing base model. The risk of compliance failure was delays in shipments, tax penalties, or personal lawsuits. Though sufficiently risky to justify adding local resources and organization, the relative financial impact of those compared to the overarching value capture did not generate a high risk level. In each of these cases, the risk was low so 'Avoidance' was not necessary and the other options became relevant.

Value capture still played an important role. First, protecting and including the high return material core was essential for signing and seeking deals. Aero was more likely to take other adaptive responses 'in addition to' their core material offering. An acquisition brought service contracts on rival OEM engines which meant Aero's material was not included. Aero attempted to use 'Avoidance' by negotiating an exit from those contracts, but an agreement could not be worked out with the airline customers. They continued to manage those contracts until the term was finished and did not renew them. Value capture was insufficient to justify the operating risk assumed through the long term contracts since the financial returns were low by buying replacement material from the rival.

Aero also faced negative value capture from that situation as well. By taking on the long term operating risk of rival OEM engines, Aero inadvertently added legitimacy of the quality of the rival OEM engines. This created value for rivals based on a 'willingness' to take on long term operating risk of a product as noted by Shimp and Bearden (1982). To manage that conflict, Aero actively pursued an 'Avoidance' response. Even though they were unsuccessful at exiting the contracts to service rival engines, Aero did undermine the 'willingness' aspect to reduce the legitimacy of maintaining competitor engines.

Taking the decision sequence further, the core may be protected and the values and goals aligned, but if some form of value cannot be captured, 'Avoidance' is likely as well. I use the term value here in the broadest sense which includes economic returns, strategic positioning (Porter, 1986), and social legitimacy (Suchman, 1995). For example, acceptable rates of return on investment, market share or control, and approved access to needed resources each create value for the business model and increase its potential for survival and sustainability. When these factors are not captured or are too low relative to other investment options, the strategic response will likely be 'Avoidance' even when the core is protected and the values and goals are aligned[8]. Typically the inclusion of the core will generate sufficient value capture which is why Aero avoided deals that did not include it. However, low pricing or excessive risk

[8] Typically the inclusion of the core will generate sufficient value capture which is why Aero avoided deals that did not include it. However, low pricing or excessive risk may limit the risk-weighted value of an offer that includes the core.

may limit the risk-weighted value of an offer that includes the core. This leads to the following proposition.

> Proposition 1: Perception of Risk is positively associated with Avoidance strategy of BMA. Risk is perceived to be higher when (a) the core of the business model (a high value component) is affected, (b) the values and goals are not aligned, or (c) loosely defined value is not captured.

Avoidance is almost always an option. Oliver (1991) suggested that avoidance of institutional demands is more likely in cases of multiplicity of those demands. This is particularly true when routinized practices and taken-for-granted structures reduce the likelihood of adaptation (DiMaggio and Powell, 1983; Hannan and Freeman, 1984; Meyer and Rowan, 1977; Zucker, 1977). However, Seo and Creed (2002) suggest that considering all institutional demands in totality enables awareness. Increased awareness coupled with other sources of demands suggests that more factors should be considered.

When considering all demands, the cost of avoiding may be too great to bear either physically, competitively, or psychologically. For example, the business model may not enter or may retreat when faced with pressures that conflict with the core or do not provide some sort of loosely defined value. Case 6 demonstrated a conflict with the core, so entry was foregone and Aero attempted to retreat from the contracts acquired which did not include their material core. Most decision points would suggest that avoidance is a highly probable outcome. On the other hand, lack of entry may weaken the competitive position (Porter, 1986) or retreat may be more costly for various reasons including political influence, long term strategic relationships, or simple

executive hubris (e.g. Camerer and Lovallo, 1999; Chatterjee and Hambrick, 2007). When this is the case, avoidance is not necessarily a strategic option.

Another possibility is when avoidance is taken for granted as not being an option. In some cases, business models are adapted when they could easily avoid the costs of change. For example, this occurs when assumptions are not validated, strategic plans are not revisited when better information is available, sunk costs are taken into consideration, or it is culturally, institutionally, or politically unacceptable to ignore a given demand or pressure. In these cases, the other three types of adaptive responses are pursued.

Although avoidance is always a possibility, cross-case analysis of the types of changes showed that other adaptive responses are also present when Aero faced multiple demands. Continuing the cross-case analysis with a focus on the external drivers of responses has led to the construct of congruence as well as patterns of external demands for certain responses. Demands create pressures or forces on the business model to move in a certain direction. Multiple demands can create many forces which generate dynamics when one force is stronger than the others or stasis when they equally oppose each other. There is a tendency to focus on the dynamics or growth of the firm (i.e. Penrose, 1959), but firms may also be caught in stasis or even heading backward based on the set of demands[9]. Congruence considers the alignment

[9] The baseline is captured at an arbitrary point in time which will establish the direction of congruent, orthogonal, and conflicting forces. Orthogonal is essentially any non-conflicting, non-supporting (perpendicular) pressure on the baseline. Conflicting is any force that goes against the baseline direction. There are also neutral demands which run parallel to the baseline which are not considered for BMA since they are not directly influencing the business model to drive change. The nature of the demands may change over time. The forces or demands may stem from within the business model (similar to atoms held

of the demands, or forces, relative to the base business model. Multiplicity of demands may be congruent and support the existing model. Others may be orthogonal and press for new opportunities that do not conflict with the base model. Other sets of demands may directly conflict with the base model. There may also be neutral demands which do not currently affect the business model. Figure 6.2 shows a diagram of the influence of the different types of congruence in the external demands.

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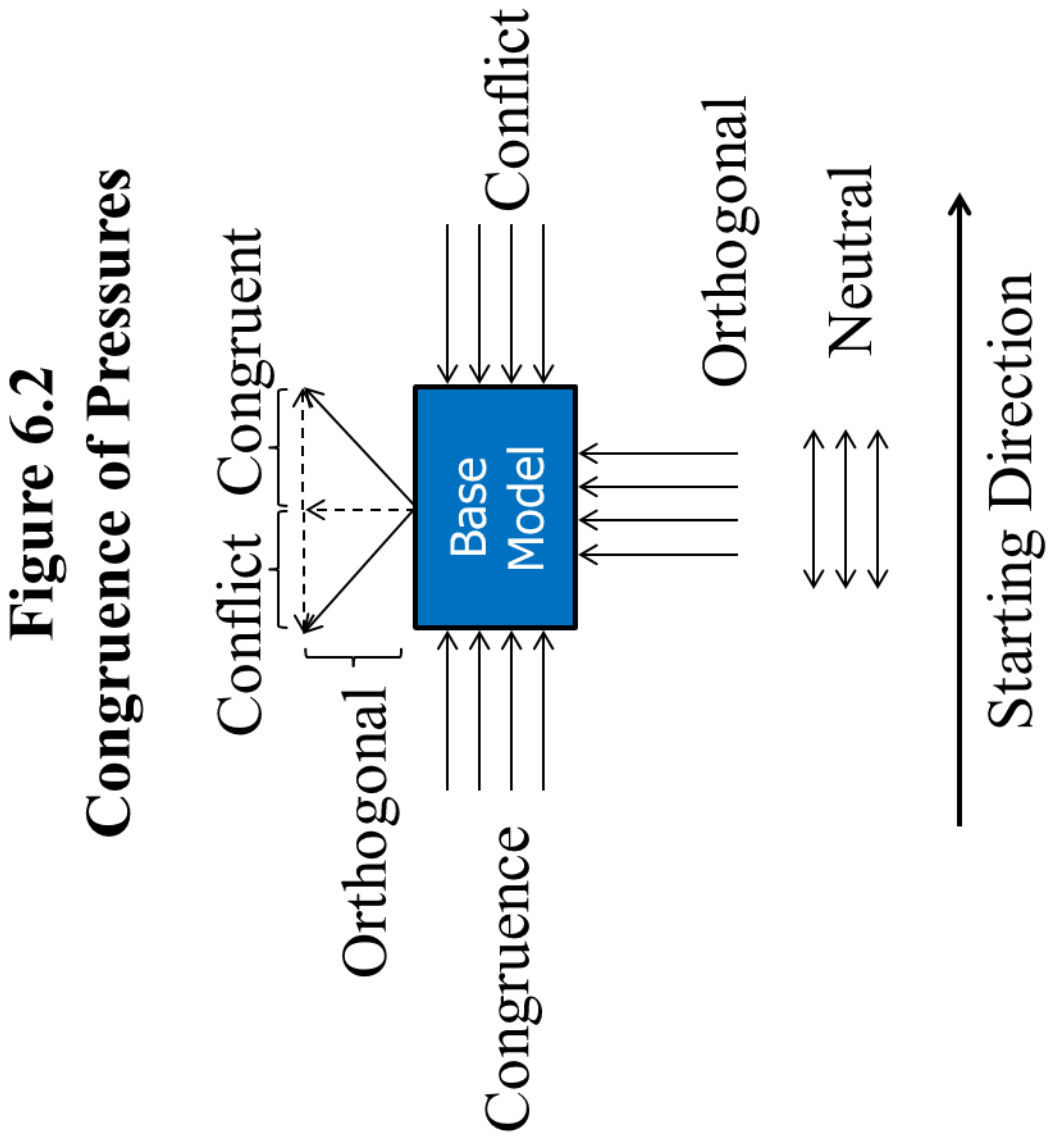
together in a molecule or molecules in compounds) or externally on the business model. If the external forces are too strong, the molecules may separate. See Pache & Santos (2010) for a review of internal conflicting demands which may lead to organizational breakup. This section of the dissertation, however, is on the external forces and the related changes. The internal can occur at multiple levels, so the types of BMA are internal responses to external forces such that internal integrity is mostly maintained despite changes from the types of BMA. A break is assumed to be part of avoidance since the focal point is the existing business model.



To understand how the multiple demands influence the types of business model adaptation, we need to consider types of congruence. Table 6.2 summarizes the type of forces on the business model. We see that each example was the result of some combination of orthogonal or conflicting demands.

Table 6.2
Cross-Case Analysis for Congruence Comparison

	Description	Orthogonal Demands	Conflicting Demands
Example 0	Global (Base)	No	No
Example 1a	Line Replacement Units (LRUs)	Yes	No
Example 1b	Finance & Insurance	Yes	No
Example 1c	Fuel upgrades	Yes	No
Example 2	Backward integrated customers	No	Yes
Example 3	Backward integrated competitors	No	Yes
Example 4	Backward Integration for Local Jobs	Yes	Yes
Example 5	Nested Institutional Contexts and Credit Risk	No	Yes
Example 6	Weak IPR Protection Countries	No	Yes
Example 7a	Institutional Differences - Trade	Yes	No
Example 7b	Institutional Differences - Accounting	Yes	No
Example 7c	Institutional Differences - Human Resources	Yes	No

When orthogonal demands were present, the pressures were to go in a new direction which did not conflict with the base model. Case 1 added line replacement units, risk transfer products, and fuel upgrades. Each of these was incremental to the base model and did not create a conflict for it. The BMA was an 'Appendage' that added resources and organization to satisfy external demands. Similarly, Case 7 added compliance organizations that managed the variation in demands without affecting the base model. Again, this was an 'Appendage' type of BMA where local resources and organization were added and loosely coupled to the base model. In Case 4, Aero used 'Reconfiguration' to satisfy orthogonal demands for local jobs and capabilities.

Conflicting demands were present in Cases 2, 3, 4, 5, and 6. In Cases 2 and 3, the customers, whether end users or competitors, wanted to backward integrate and purchase only part of the value chain. Aero used 'Segmentation' to allow each stage of the value chain to be sold internally and externally. The 'Reconfiguration' from Case 4 also experienced conflicting demands because the resources needed to create local jobs and capabilities were embedded within the base model. Aero faced conflicting demands in Case 5 from excessive perceived credit risk and in Case 6 from weak IPR protection. These last two demonstrated 'Avoidance' rather than another BMA type because the conflict was too significant as noted above.

The base case model showed neither orthogonal nor conflicting demands, but rather those demands were congruent[10]. The base case noted several influences that

[10] Non-orthogonal and non-conflicting demands may also be neutral, but as noted above the focus here is on environmentally driven change so only congruence is considered. A change may extend the model into previously neutral demands which then forward have some direct influence on the model. For example, BHP Billiton used an Appendage for each location where critical minerals existed. That adaptive response

supported it such as technology, global competition, and various types of institutional standardization. Multiple demands generated complementary pressures that reinforce the centralized, standardized global model that represents Aero's base model. The demands were congruent so no change was needed.

Whether the demands were orthogonal, conflicting, both, or neither forms a 2x2 matrix based on orthogonal demands (yes or no) and conflicting demands (yes or no). By overlaying the types of BMA with the congruence framework we see that congruent demands limit the need for change and support the base global model. Demands that are only orthogonal and not conflicting each generated an 'Appendage' response as demonstrated by Examples 1 and 7. This allowed for the base model to remain while also meeting additional demands. On the other hand, demands that were only conflicting and did not pressure the model along a new axis tended to be resolved through 'Segmentation'. Examples 2, 3, and 5 showed that the base model was loosely coupled and reduced as needed to satisfy the conflicting demands. The final category was when the demands created both orthogonal and conflicting tensions for the base model. Aero's base model was subject to such demands when customers wanted local jobs and capabilities (orthogonal value) which could only be created by extracting embedded resources and contradicting the economies of scale present in the technology (conflicting pressures). Figure 6.3 provides a visual representation of this causal framework and the related types of BMA.

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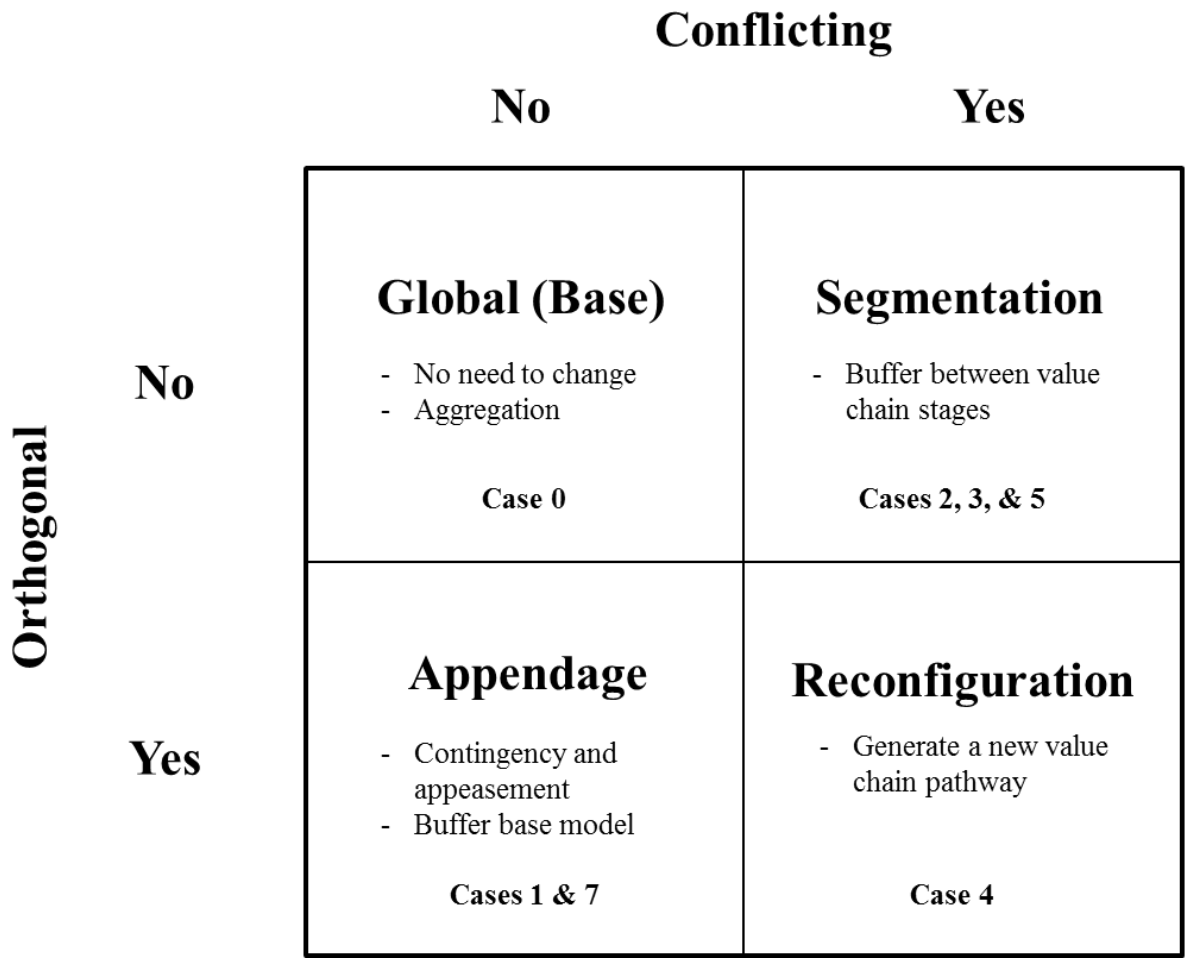
generated direct influence from the local populations which led to further Appendages in the form of schools and local hospitals. The original choice of extracting the strategic minerals was only indirectly influenced by the secondary response from local stakeholders.

Figure 6.3
Causal Framework for Business Model Adaptation



The Causal Framework for Business Model Adaptation does need some qualification. As noted above, 'Avoidance' is always an option and risk-weighted value capture is a critical determinant. Conflicts may generate excessive perceptions of risk that limit or reduce an offer as seen in Examples 5 and 6 rather than generating 'Segmentation'[11]. Also, insufficient value capture, even on low risk ventures, may also spark 'Avoidance' rather than an 'Appendage'. This is equivalent to Porter's (1985) 'Focus' strategy where the added value options are not pursued. These features are considered above in the section regarding 'Avoidance' and should be considered in conjunction with the Causal Framework for Business Model Adaptation.

Another qualification is regarding the potential for orthogonal-and-congruent or conflicting-and-congruent. The prior type of demand was actually present in the Line Replacement Unit offer within Case 1. The demands were for additional resources that could be easily included, but the delivery of the added value leveraged the existing channels creating congruence. The affect was still an 'Appendage' of resources loosely coupled to the base organization element. In this way, the congruence may have acted to reduce the likelihood of 'Avoidance', but did not change the 'Appendage' response. Therefore for simplicity, the orthogonal-and-congruent demands are considered together with the orthogonal and non-conflicting demands.

The concept of conflicting-and-congruent seems counter intuitive, but when the business model as a system is considered this type of demand becomes clearer. Examples 2 and 3 each experienced conflicting and congruent demands. The demand

[11] Aero actually fully offered the risk-transfer value proposition before the risk assessment occurred. This led to a reduction of the offer. Perceptions may change over time.

for a lesser degree of the value proposition was conflicting for the base model yet still congruent for the earlier stages of the value chain. The 'Segmentation' of loosely coupled stages of the value chain enabled the demands to be met while supporting the material core. Similar to the above, the congruence aspect reduced the likelihood of 'Avoidance', but did not change the outcome and thus conflicting and congruent essentially collapses to conflicting and non-orthogonal.

Based on the Causal Framework for Business Model Adaptation, the following propositions ensue:

> Proposition 2: The global (standardized, centralized) business model is likely under conditions of congruence, i.e. multiple pressures which support the existing model because they are non-orthogonal and non-conflicting.
>
> Proposition 3: Appendage is most likely when the demands are orthogonal and non-conflicting for the base model.
>
> Proposition 4: Segmentation is most likely when the pressures are non-orthogonal and conflicting for the base model.
>
> Proposition 5: Reconfiguration is most likely when the pressures are both orthogonal and conflicting for the base model.
>
> Proposition 6: Avoidance is less likely under conditions of congruence, i.e. fully congruent, orthogonal-and-congruent, or conflicting-and-congruent pressures.

Chapter Summary

In summary, business models are continuously subjected to multiple pressures. The way those demands interact with the business model directly impact how the business model system responds. If the demands are congruent, they are likely to be met. When the demands are orthogonal and/or conflicting, different types of BMA are likely if the

perceived risk-weighted value capture is sufficient. By examining the Aero business model across many diverse demands, the types of adaptive responses became apparent, as well, as the implications for variation in Congruence[12].

[12] Congruence is used to term the construct. In this situation, it is used in reference to supporting, orthogonal, and conflicting demands in general.

CHAPTER 7

DISCUSSION AND CONCLUSIONS

This chapter discusses the findings in more detail along with the related generalizability beyond this case setting. The theoretical and practical contributions are also considered. The chapter then elaborates on the limitations of the dissertation and directions for future research. A brief summary is given at the end.

Discussion of Findings

The dissertation provides a typology of adaptive business model responses, a typology of external influences, and also a typological theory by examining the causal mechanisms that lead to the different outcome types (George and Bennett, 2004). The use of a single business model with multiple embedded cases implies limited generalizability, however, the use of Aero as a least-likely case for adaptation helps to extend the external validity. Most considerations of adaptation in the global strategy literature focus on technological lock-in, competitive contexts, and institutional pressures. Based on these mechanisms separately, Aero should not have shown global variation of its business model. The technology was extremely slow to change due to extensive development costs. Aero was one of three main rivals in an oligopoly of engine manufacturers, which when coupled with the technological lock-in offered significant power to resist competitive pressures for entry. The standardization of the

regulatory requirements also demonstrated a very unlikely environment for business model adaptation.

Despite these limits to adaptation, Aero demonstrated multiple patterns of business model adaptation. The research design of selecting the least likely case provided comparative generalizability, but this was further supported by the cross-case analysis within Aero. The constant comparison across cases and against theoretical models enriches the generalizability further. Many variables were compared and contrasted, but few were sufficient to address the variation across the set of cases. Degree of integration, i.e. the extent of connectedness between the components of the adapted model, was one dimension that showed the range of variation from high to low. Additionally, the Nature of the Response, was the second dimension across which the range of variation was present, i.e. expand or reduce the base model. When interacted, the patterns from the cases demonstrated examples of all four cells in the typology.

These dimensions were derived from the cases, but also validated against the existing literature. The findings of this dissertation both support and extend the work on Integration-Responsiveness (Bartlett and Ghoshal, 1989; Prahalad and Doz, 1987). The findings confirm the importance of the degree of integration, but extend the model by considering the nature of the response rather than the degree to which the local demands were met. This helps to nest the findings within the existing literature, but also to demonstrate a new contribution from the typology. In doing so, it increases the external validity of the results.

Inclusion of multiple variables both in the environment and the business model further adds to the external validity of the findings. One of the key a criticisms of typological theories is the potential for exclusion of other causal variables (George and Bennett, 2004). However, by using the business model construct, the critical internal variables were included. Every firm has a business model (Casadesus-Masanell and Ricart, 2010) which is comprised of the basic elements of resources and competences (R/C), organization (O), and value proposition (V). The findings can then generalize to all firm business models.

The analysis also included the variables noted from the literature which include many factors from the business environment and also the institutional environment as discussed above. By doing so, the likelihood of omission of a crucial causal variable was diminished. In addition, process-tracing tactics such as detailed narratives for each case pattern, analytical explanation relative to existing literature, and 'moving up the ladder of abstraction' (George and Bennett, 2004: 211) also reduced the likelihood of omission and improve the generalizability of the findings.

Furthermore, the simplification of the multiple external demands and pressures into the congruence construct provides a mechanism to generalize across the diverse set of demands. The congruence construct was divided into the four most fundamental sub-types. Any set of demands, despite their sources, i.e. business or institutional contexts, can be broken down into components of pressures that are congruent, orthogonal, conflicting, or neutral. By simplifying to these basic elements, the findings can then generalize to any set of sources. For example, technological pressures in the newspaper

industry provide orthogonal demands for online content while institutionalization of the paper form remains congruent. The related response for business models in the industry have been either to add online content while maintaining their paper model or avoid it and stick to the baseline paper model. If the pressures to go 'green' are also considered simultaneously, the demands become orthogonal and conflicting together which may drive a reconfiguration to purely online content.

By theoretically excluding the neutral demands because they are not creating any pressure for the business model at the given time, congruent demands were then used as the default for multiplicity when no orthogonal and no conflicting pressures were present. The causal framework thus includes all three remaining components of the congruence construct. Furthermore, congruent demands simply added more support for undertaking business model adaptation related to the other components of the set of demands and reduced the likelihood of avoidance. Congruent-and-orthogonal demands resulted in the same outcome as orthogonal alone with similar findings for congruent-and-conflicting. The congruent element limited avoidance and thus combinations of demands that included congruent pressures could be simplified to the remaining set of demands. All of this together allows for 'reducing the property space' (George and Bennett, 2004: 249) of the causal framework to be simplified to the presence of orthogonal and/or conflicting demands and still generalize across the range of possible demand sets.

Overall, the research design to use a least-likely case for adaptation coupled with process-tracing and constant comparison across cases and existing theory models

improves the external validity. The use of the business model construct, which is present in all firms, and the breadth of contextual variables in the analysis limit the risk of omission. The comparison of results with the existing literature provides theoretical sensitivity to show that the results partially match the well accepted Integration-Responsiveness literature and extends it by consider the nature of the response. In addition, the set of demands were simplified to a level of abstraction that was not overly generalized, i.e. the construct of multiplicity, which could not explain the variation in the business model adaptation typology. Rather multiplicity of demands was divided into the theoretical range of combinations which were causally linked to the different adaptive pathways. All of this suggests that the findings are rather robust.

Implications for Theory and Practice

This dissertation provides an answer to how the cross-border business model as a system responds to the multiple demands of the semiglobalized world. To set the stage for the contributions made by this dissertation, it is important to first clarify the existing landscape of the literature and the related need for development. The landscape is made up of three parts which equate to the three primary contributions made. First, the external environment consists of multiple demands and pressures from a variety of sources. The second facet is the internal system with multiple components that comprise the business model. The final aspect of the existing landscape is the interaction of these two complex and multi-faceted systems.

The debate between globalization and localization was initially about whether to maintain a centralized, standardized global model or to adapt to the different environmental demands. Ghemawat (2007) explained, however, that these extremes are actually the same because they simplify into single country strategies depending on where the boundaries are drawn. The global implies there are no boundaries and only one giant country that encompasses the globe and the local suggests that the focus of strategy is within each country. He then demonstrated the world is only partially globalized 'over a very broad' domain (Ghemawat, 2007: 30). This intermediate area subjects cross-border business models to many sources and types of demands and pressures. How the MNE responds to the multiplicity of demands becomes a crucial question for global strategy which is addressed in this dissertation.

The cross-border business model is also a set of multiple interactive components. Amit and Zott (2001) systematically outlined the limitations of existing strategic management theories which prevented them from fully explaining value creation and suggested the need for the construct of the business model. Every firm has a business model which is the outcome of its strategic actions (Casadesus-Masanell and Ricart, 2010). The business model is a complex construct which may be different across firms (Baden-Fuller and Morgan, 2010). However, the internal complexity of the business model can be simplified into a generalizable set of dimensions across firms: resources and competences (R/C), organization (O), and value proposition (V) (Demil and Lecocq, 2010). Despite this simplification, the adaptive responses are still not clear due to the

interactive nature of these R/COV components within the business model system. Thus, the cross-border business model system is facing multiple external demands.

This dissertation delves into the gray area where the semiglobalized world generates pressures from many sources which affect the internal system of the business model. The complexity of both the external and internal makes the interaction of the two that much more complicated to understand. To shed light on this morass, this dissertation made three primary contributions by splitting the analysis into components. First, the focus on the response to multiplicity in general simplified the internal complexity into a typology of business model adaptation which constitutes one contribution of this dissertation. Second, the multiplex demands of the semiglobalized world were simplied into the construct of congruence, i.e. the nature of the pressures relative to the business model. This simplification of environmental multiplicity into the congruence typology is another primary contribution. The third main contribution was the typological theory that was generated in the final stage by examining the interaction of the business model adaptation typology with the congruence typology. The causal relationship between the types of multiplicity and the form of business model adaptation provides clarification for the interaction of a complex internal and external system.

Though not the primary focus of the dissertation, the findings also have implications for a number of other areas. Though there were multiple responses, the core advantage was consistently protected and reinforced enabling value capture to overcome the liability of foreignness and support sustainability. The multiple adaptive responses support Demil and Lecocq's (2010) discussion of a need for 'dynamic consistency' by

showing that primary adaptations to environmental demands may also require secondary internal changes. The results of this case, however, contradict their claim that protecting the competitive advantage means no major changes in the operating business model. The Aero case demonstrated that the competitive advantage can be protected through multiple forms of BMA, some of which are rather significant changes.

When the incongruence can be resolved, basic adaptations are likely to occur so long as they do not significantly undermine the core elements that generate the competitive advantage. When the incongruence persists, co-existing business model options are more likely. The adaptations will leverage existing core resources while reorganizing peripheral resources in order to create additional externalities of value for the stakeholders. The co-existing options create strategic paradoxes (Smith et al, 2010) that must be managed to prevent break up or stasis (Pache and Santos, 2010) and enable innovation and growth. In order to manage these paradoxes, layering occurs within the business model which allows the conflicting demands to be balanced to satisfy an overarching logic or objective. The conflict will be compartmentalized, typically through geographic or some other form of external segmentation, however, compartmentalization and balancing may still not resolve the conflict. A mixture of externalization and organizational controls will be used to distance the conflict from the existing business model or to limit further adaptation of the base business model.

This dissertation also helps to refine the conceptualization of the environment's effect on the business model. The mutually constitutive nature of the environment and the business model shows that the business model and the environment must be

considered together to truly understand the strategic response. The choice to adapt or not may depend on how the adaptation will occur. This work clarifies the distinction between multiple demands and incongruent demands on the business model. Multiplicity is necessary, but not sufficient to create incongruence. Multiple demands may create conflict, however, they may also reinforce the existing model or provide an opportunity for new directions. Conflict for the business model arises when the demands would require actions that become contradictory for the existing business model.

In addition, this work demonstrates that the totality of demands needs to be considered in order to truly understand the influences and responses. Aero faced several pressures that would have suggested exit or the use of entry barriers. However, when all the demands were considered together the business model response demonstrated neither of these tactics. The backward integration of customers as competitors received support as opposed to retaliation. Aero adapted in various other ways which satisfied or held at bay multiple demands and conflicts while maintaining their core. Future research will need to take into consideration all of the demands as they relate to the business model being considered as a system to identify the congruence of the demands and not simply multiple demands.

In line with the need to consider all the demands in totality, the multiple sources of pressures must also be included in the analysis. Many sources of demands and conditions were considered together in this case study. In doing so, it became clear that the multiple types of sources from consumer to competitive to institutional need to be

considered together in order to identify how the business model as a system responds. Only considering one type of conditions may skew the perspectives on strategic response.

Previous work has explained various strategic responses to institutional demands in general (Oliver, 1991) and more specifically to conflicting demands (Kraatz and Block, 2008; Pache and Santos, 2010). Others have considered conflicting demands as they relate to organizational responses such as the development and adoption of different practices or sets of practices (Lounsbury, 2007; Greenwood et al., 2009; Purdy and Gray, 2009). This dissertation offers insights into the effects on the business model with multiple interactive components. The multiple demands provide both opportunities and conflicts which must be managed and the case demonstrates when different strategic responses are likely to be taken and the related implications for business model adaptation. Including all the business model components provides insights into the need for various responses.

Also, this work shows that the business model needs to be considered as a system because the value proposition is composed of more elements than the product or service alone. Additional value can be created and captured by using modular organization of resources to offer value propositions throughout the value chain (vertical product diversification) or expanding the existing scope (horizontal product diversification). Value can also be created and captured by reconfiguring the organization of the set of resources to deliver other externalities, i.e. local jobs and capabilities, in addition to the base product or service value proposition. Value may

actually be created simply by organizing with local resources which are imbued with greater value despite no physical difference besides location itself[13]. Thus, this dissertation demonstrates how value can be created and captured when the organization, resources, and value proposition of the business model are considered together as a system.

Aero was able to leverage Winter and Szulanski's (2001) replication as strategy to generate localization value without compromising standardization. Aero standardized their workscopes and also created local maintenance capabilities. This case demonstrated how localization can also be standardized across nations to provide a new business model offering for multiple national environments. In doing so, it draws the focus back to the concept of segmentation as opposed to simply localization. Some forms of localization can be aggregated to form larger segments than those at the national level. Aero added value across multiple countries through localized jobs and related externalities, but it also was not able to present the idea of local maintenance to other customers. This supports the idea of levels of segmentation across borders to identify transnational similarities even when they are not necessarily globally identical or even regionally situated.

By considering the strategic adaptive responses for the cross-border business model, this work helps to explain how even multinationals in global industries can adapt in ways that form business model portfolios (Nachum and Song, 2011; Sabatier et al., 2010) and

[13] This assumes the local resources are not also imbued with additional advantages such as special skills or work-systems influenced by the local institutional environment. Local skilled labor in this case was not necessarily more efficient, but rather added value based only on the location of the jobs.

different configurations (Roth, 1992). Depending on the type of business model adaptation that occurs, different configurations of the multinational may develop. It also supports contingency theory in the sense of offering multiple options for the various demands (Thompson, 1967), although the strategic adaptive responses are limited to only a few basic types. As multiple, incongruent demands are placed on the business model, it incorporates them with an adaptive response. Those adaptive responses can then be aggregated to other similar demands.

The Aero case demonstrated this portfolio effect through the 'Reconfiguration' that generated the maintenance and repair organization (MRO) partner in Case 4. The initial extraction and recombination of the embedded resources to facilitate the local partnership was a 'Reconfiguration' response. Once that response occurred, the ongoing establishment of Maintenance and Repair Organization partners was merely replication of the original. The reconfigured model became part of a portfolio of interchangeable value constellation options. Similarly, the 'Appendage' responses in Case 1 also were easily added when demanded and the 'Segmentation' in Examples 2 and 3 did the same.

BMA does not necessarily always mean a portfolio of options though. For example, 'Reconfiguration' could be complete to the point that the original model is no longer in existence. The base is usually maintained in existence at least temporarily, but the new model option may over take it through evolutionary forces. This stems back to the persistence of incongruent demands. When they remain, co-existing models are also more likely to sustain as well. The MNC faces many situations where incongruent

demands continue to press the model and thus the business model portfolio concept is likely.

The multi-type adaptive responses extend the Integration-Responsiveness (IR) literature as well. The Aero case showed that the 'global' model was maintained in connection with a 'multi-domestic' sub-model that created localized value without fully integrating them as a segment in an overarching 'transnational' model (Bartlett and Ghoshal, 1989). The case does not contradict the potential value of such an integrated model in a congruent environment with different location-specific resources, but it does demonstrate that incongruence of demands may limit the potential for such a model and enable others to be equal or better solutions[14].

Finally, though it was not a primary focus of the research, the social construction of competition was demonstrated through Aero's business model adaptation to conflicting demands. Aero competed for overhaul service work, but also provided start-up resources to external competitors. They resisted competition related to their core, but enabled competition when their core could be protected and expanded. The strategy literature would suggest that Aero would either reduce their scope to avoid the conflict and low returns or actively strengthen their position in the maintenance market by constructing barriers to competition. Aero did neither of these due to the set of conflicting demands within which it had to operate. They both competed with and subsidized competitors in areas that were not core to their business model. Additionally, recent work by Parmigiani (2007) suggests that transaction costs and

[14] See also the work of Kristensen and Zeitlin (2005) and Whitley (2010) regarding the limitations of the ideal Transnational Solution.

capabilities are likely to drive the decision to both make and buy a good or service. However, Aero was more efficient and received better prices internally and they transferred capabilities out to partners rather than receiving them. This work then adds to that of Parmigiani (2007) by showing that a firm may also make and buy due to constraints from incongruent demands and the opportunity to lock in long term customers for the core components.

Limitations and Directions for Future Research

Although the typology of responses appears to be robust as noted above, the single case does not provide statistical generalizability. The multiple embedded examples, theoretical sampling to represent global firms in global industries, and comparative methods demonstrate external validity. However, with a large enough sample, future work could statistically validate the propositions derived here. Despite potentially extensive differences in the business models used by firms (even within the same industry), the Causal Framework for BMA can be empirically validated through coding differences from a base model. Once a base model is identified, multiple demands on the model can be coded to assess their relative type of congruence. The response can then be coded relative to the BMA types. For each type, correlations and regressions can be used to validate the causal connections. Deviations would suggest further moderators and mediators.

Another limitation was that the relative strength of the demands was not considered. Future studies can suggest how the strength of each source of demand

plays into the related outcomes. Elaborating on the newspaper example above, the 'green' movement may influence some business models more than others through the constituent readers for each firm and related business model. Even though the 'green' movement may be present for all business models in the newspaper industry, some may choose avoidance strategy if their readers prefer a paper copy while others may reconfigure to a strictly online model. The strength of the demands may play into the related response and should be considered in future studies.

This case study was able to control for a single firm in a single global industry which enabled critical external factors and internal responses to be pinpointed without confounding across firm or industry responses. Further insights into common configurations of BMA types and environmental demands can be attained by comparing other firm business models, industries, and technical, competitive, and institutional environments. For example, segmentation of the value chain across borders through internalization (Buckley and Casson, 1976) may lead to reconfiguration of the segment to maximize value locally and take advantage of location-specific advantages. Aero, however, maintained standardization and created value simply by relocating or added appendages to mitigate localization pressures. Future studies could clarify the likely use of certain combinations of BMA.

Using the business model as a level of analysis helped to give greater insights into the effects of differences within the multiple pressures faced which tend to be business model specific. However, many MNCs operate multiple business models. Understanding the interaction of these business models and their related environments

to form overarching MNC configurations would be a fruitful future endeavor. Finally, the dissertation took a semi-static view of the business model and related demands by looking at snapshots of congruent, orthogonal, and conflicting demands and related business model adaptations. Studying the process through which cross-border business model adaptation occurs will also be a helpful future research extension.

Chapter Summary

In summary, cross-border business models face many external pressures and demands in a semiglobalized world which must be managed beyond the extreme cases of the global or multi-domestic models. Managers must be able to incorporate the environmental pressures in conjunction with the internal components of the business model as a system. This dissertation explores this complexity upon complexity as the multi-faceted business model adapts to the multiplicity of external demands.

The inductive research design enabled the exploration of both breadth and depth of the interaction of the internal and external systems. Despite only a focus on a single firm with multiple embedded cases, the methodology provided mechanisms for improved external validity. Theoretical sampling, pattern matching, constant comparison, process-tracing, and theoretical sensitivity each added to the generalizability of the findings.

The findings generate three main contributions with several others that were not a primary focus of the dissertation. The first two advances are typologies which simplify the internal responses and external demands, and the last integrates the two into a

typological theory. When faced with the multiplicity of demands across borders, business models must adapt while taking each of the RCOV components into account. The outcome is a typology of business model adaptation. Then, focusing on the multiplicity of external demands, the extensive variety of sources and influences simplify into the construct of congruence. Multiplicity is divided into types of pressures based on the nature of the demands as they relate to the business model. This external congruence typology is used to identify a causal typological theory to explain when the types of business model adaptation are most likely to occur. Several other peripheral contributions are also discussed such as the social construction of competition and the implications of multiplicity for the make-and-buy decision.

The dissertation opens the door to many future research opportunities of which a few are mentioned here. First, the results can be tested using a large N study. Second, the relative strength of the demands would offer very interesting insights into the implications of business model adaptation. Third, expanding the view to a portfolio of business models may help to explain the variation in the configurations and combinations of the MNC. Finally, this work can help to build on the existing literature to better understand the dynamic evolution of business models.

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APPENDIX

INTERVIEW SUMMARY

Title	Description	Time (min)	Locale
Aero CFO	Chief Financial Officer for the Aircraft Engine Parent	30	Phone
Aero Services CEO	Chief Executive Officer for the Aircraft Engine Service Business Unit	45	In Person
Continuous Improvement Manager	Productivity and performance management	60	In Person
		60	Phone
Commercial Operations Manager	Deal support and analysis for all sales including engines and services across all product lines	60	In Person
Large Size Engine Manager	Product oversight and integration across engine manufacturer, sales, service and customer relations for all customers	60	In Person
		45	Phone
Medium Size Engine Manager	Product oversight and integration across engine manufacturer, sales, service and customer relations for all customers	60	In Person
Manager of Finance for Services	All accounting, financial reporting and forecasting, and risk management from deal signing to completion for Aero Services	60	In Person
Repair Manager	Operational oversight for repair facility	105	In Person
		45	In Person

ex-CEO of American Airlines (Bob Crandall) & Travel Editor at CBS News on the Airline Industry (Peter Greenberg)	Crandall: American's CEO from 1985 until 1998. Greenberg: Reporting on Airline Industry	30	Charlie Rose, TV