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TIME TO LEARN?
ASSIGNMENT DURATION IN GLOBAL VALUE CHAIN ORGANIZATION

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ABSTRACT

In the examination of outsourcing and offshoring strategies to establish and orchestrate global value chains (GVCs), scholars have focused almost exclusively on two key decision dimensions – control and location – as the primary determinants of these complex organizational structures. However, the dynamic, temporal nature of GVCs can be further explained via a third organizing decision dimension that has received surprisingly little attention in this literature: time. This relates to the length of time that control and location settings are chosen ex ante to remain in effect. We explore this issue and assert that assignment durations are linked to activity type, and that mismatched durations can destroy value in even the most logically controlled and located GVC activities. We argue that while control and location are essential decisions for GVC orchestrators, how long these settings are in put into effect also plays a critical but overlooked role in efficient value chain organization.

Keywords: Global value chains, global factories, orchestration, outsourcing

1. INTRODUCTION

Over the past several decades, 'global value chains' (GVCs) and their organizational counterparts 'global production networks' (GPNs) have become the dominant conceptual approaches for analyzing modern outsourcing and offshoring activity (Bair, 2008; Coe, Dicken, & Hess, 2008; Crang, Hughes, Gregson, Norris, & Ahamed, 2013; Gibbon, Bair, & Ponte, 2008; Hess, 2008). To better understand these evolving organizational forms and explain their role in determining firm-level activities, network effects, and regional impacts, scholars have focused predominantly on two strategic decisions - control and location - as the primary determinants of GVC structure. In general, control choices to internalize or outsource each activity address the indirect, agency-related costs of global production (e.g. transaction costs with customers and suppliers, investments in proprietary know-how, and financing costs), while location choices that determine where each activity is performed address the direct costs of production (e.g. material inputs, labor wages, and fixed assets) (Mudambi, 2008). Orchestrating or lead firms (typically large, established MNEs) take center stage in this research stream, being largely responsible for these decisions and the corresponding disaggregation and geographic dispersion of value chain activities.

Initially, orchestrators create value by configuring the activities of emerging GVCs in various control-location combinations to minimize these direct and indirect costs. As GVCs evolve, orchestrators continue to generate additional value by adjusting the organizational and spatial configurations of GVC activities to further control and reduce these costs under constantly changing environmental conditions. For example, Li & Fung Limited (a part of the Fung Group of companies) orchestrates GVCs for apparel, footwear, beauty products, and household goods. The firm coordinates global sourcing, logistics, distribution, and retailing activities via its network of

over 15,000 suppliers in more than 60 countries (Li & Fung Limited, 2016), and maintains the ability to identify and rapidly switch production for its customers to low-cost factories around the world as needed. Similarly, large pharmaceutical MNEs such as Pfizer increasingly outsource, offshore, and reconfigure significant portions of their value chains to take advantage of a rapidly growing contract services industry that has emerged over the past three decades (Dunlap, McDonough, Mudambi, & Swift, 2016; Haigney, 2016; Van Arnum, 2012). Flexibility to rapidly and effectively reconfigure control-location combinations to continuously capture increasing value through cost reduction and capability enhancement is a core competence of successful GVC orchestrators (Liesch, Buckley, Simonin, & Knight, 2012).

Although great strides in our understanding of GVCs and GPNs have been made since the early 1990s, scholars have acknowledged shortcomings in the initial phase of investigation and the need for a reformulated research agenda. For example, Yeung and Coe (2015) argue that conceptual frameworks developed in the seminal and subsequent literature (aptly labeled 'GPN 1.0') provide only static interpretations of production networks which "tend to under-theorize the origins and dynamics of these important organizational platforms and to overemphasize their governance typologies…or analytical categories" (2015: 1). A review by Dussel Peters (2008) concludes that while numerous empirical studies have methodologically revealed the specifics of particular chains, firms, and regions, theoretical work to account for these findings in a systematic and integrated way is conspicuously lacking. Seeking to advance the next phase of research (*'GPN 2.0'*), Yeung and Coe (2015) propose a novel theoretical framework that links exogenous factors which influence firms' value chain decisions to their unique organizing strategies. Three specific competitive dynamics or 'causal drivers' highlighted by Yeung and Coe are the need to optimize

cost-capability ratios, the need to sustain market development, and the need to work within the constraints of financial discipline. Together, these dynamic forces combine to affect financial performance (Mudambi, 1998), compelling GVC orchestrators to make deliberate and focused control and location choices for each activity that contribute to the observed structure of each GVC.

However, while the prevailing focus on control and location choices in the GPN 1.0 literature has advanced our knowledge of the organizational and spatial dimensions of GVC structures, there is another relatively unexplored temporal dimension of GVCs. This dimension relates to both the evolving nature of GVCs and their constituent activities, and the varying lengths of time that the control and location configurations for each activity are chosen ex ante to remain in effect. Moreover, amidst changing temporal aspects of strategic advantage in the new global economy, substantial ex post fine-tuning of contracts for location choices and governance structures is also required (Penrose, 1959; Verbeke & Kano, 2016). Orchestrating firms are therefore also compelled to continuously account for and adapt to changing environmental conditions ex ante and ex post by altering the control and location assignments of GVC activities. Importantly, the contracted length or duration of these assignments is neither fixed nor immaterial to cost structures and capability development of the resultant organizational form. Accordingly, we present the argument that how long an activity is assigned to a particular GVC configuration may be just as important as how and where it is assigned.

1.1 The Need for Flexibility

This dynamism indicates the importance of another driver of competitive behavior - the need for flexibility - which is arguably separate and distinct from the control- and location-based structural determinants specified in previous works, including the Yeung and Coe (2015) framework that prescribes a more precise view of chain governance modes and externalization strategies. The requirement for flexibility in GVC structures is addressed not by control or location choices alone as previously theorized, but through a third key organizing decision dimension: time. We argue that as far as GVCs are concerned, the most relevant aspect of this dimension is assignment duration. And yet, this decision specifically and the temporal dimension of GVC structures in general have received surprisingly little explicit or implicit attention in the GVC literature to date (as discussed below). It is important to note that assignment duration as described here - the length of time that a single activity is expected ex ante to be performed - is by definition distinct from the concept of timing or flexible sequencing of specific GVC activities in relation to other GVC activities (e.g. Contractor, Kumar, Kundu, & Pedersen, 2010). In a recent study, Choi et al. (2017) examine MNE flexibility in response to uncertainty in offshore outsourcing decisions by contrasting real options theory, TCE/internalization, and RBV perspectives. While their findings shed light on the value of outsourcing under uncertain conditions, the composite flexibility index used in their study does not reflect the assignment duration of individual GVC activities. Other areas of research (e.g. information technology, project management, and supply chain management) have explored the role of contract duration and flexibility (Barry, Mukhopadhyay, & Slaughter, 2002; Ligthart, Oerlemans, & Noorderhaven, 2016; Susarla, 2012; Young-Ybarra & Wiersema, 1999), and the inherently temporal nature of competitive phenomena has brought the

issue of time to the forefront of research on strategic management and in particular, competitive dynamics (Derfus, Maggitti, Grimm, & Smith, 2008; Nadkarni, Chen, & Chen, 2015).

In the competitive dynamics literature, both macro and micro temporal forces impact competitive behaviors and in turn, firm performance. Macro temporal factors are features of the external environment that determine the degree of sustainability of a firm's competitive advantage - the "time windows of opportunities" or rate at which new opportunities emerge and disappear (Nadkarni et al., 2015: 2) - such as industry clockspeed (Fine, 1998, 2000; Nadkarni & Narayanan, 2007; Souza, Bayus, & Wagner, 2004), industry dynamism (Davis, Eisenhardt, & Bingham, 2009), and industry velocity (Eisenhardt & Martin, 2000). Micro temporal factors are reflected in the advantage-seeking competitive actions of individual firms to create and pursue opportunities, including the speed, intensity, timing, and sequencing of strategic actions and responses (Derfus et al., 2008; Ferrier, Smith, & Grimm, 1999). Importantly, these macro and micro forces interact and the benefits that individual firms (and in our context, GVC orchestrators) can derive from micro-level sequencing and timing actions depend on the macro-level temporal features of the industry (Derfus et al., 2008; Katila & Chen, 2008). Orchestrators such as Apple, Boeing, Li & Fung, and Pfizer take advantage of arbitrage opportunities that emerge by adjusting micro temporal strategies as macro conditions (e.g. supplier capabilities and factory wage rates in sourcing countries) vary. Scholars in this area contend that competitive behavior and thus performance are enhanced when micro-level temporal actions by the firm are aligned with the macro-level temporal dimensions of the environment, whereas mismatches between the two will undermine competitiveness and performance (Nadkarni et al., 2015).

In parallel with this competitive dynamics logic, our focus on assignment duration calls attention to an important theoretical puzzle with direct managerial implications: GVC activities, when organized in seemingly optimal control and location combinations, may still generate suboptimal value due to the length of time the particular control and location arrangements are in effect. For example, an outsourcing MNC may find itself committed to a multi-year, fixed-price supplier contract when lower-cost alternative suppliers emerge. In other words, the micro-level temporal organization of GVC activities by the MNC may not always be in alignment with the macro-level conditions in which the GVC operates. These insights suggest that the organization and scholarly analysis of efficient GVCs requires attention to three critical decisions (control, location, and assignment duration), and not two as has been the standard operating procedure to date.

Why is the addition of this missing factor important, and how will this change in thinking impact scholarly discussions in this area? In our view, new theories of GVC emergence and evolution that continue to be based exclusively on organizational (control) and spatial (location) dimensions of GVCs, with only collateral integration of the temporal (assignment duration) dimension, will be limited to small, incremental refinements to the foundational but static theories of GPN 1.0 (Yeung & Coe, 2015). Instead, we propose that more substantial, radical advances will be achieved in GPN 2.0 via more direct and intense exploration of this micro-level temporal dimension, aided primarily by a corresponding emphasis on assignment duration as the third key organizing decision in GVCs.

Our goal for this paper is to steer the emerging GPN 2.0 agenda toward a more thorough investigation and understanding of the interactions among control, location, and assignment duration decisions, which collectively drive value creation in emerging and evolving GVCs. In

recent years, two related and complementary theoretical perspectives - the 'global factory' (Buckley, 2009a, 2009b; Buckley & Ghauri, 2004) and the 'smile of value creation' (Mudambi, 2007, 2008) - have emerged within the expanding body of GVC literature. These perspectives sharpen the analytical focus of earlier works by distinguishing the types of actors and activities that embody the structural and functional aspects of global production systems. Notably, these actor and activity distinctions also provide a solid footing for a deeper examination and integration of the assignment duration decision and the temporal dimension of GVCs. By combining and extending the 'global factory' and 'smile of value creation' perspectives, we contribute to the literature by introducing a novel, holistic picture of the three key decisions that impact outsourcing and offshoring strategies.

In the sections that follow, we explore the collective role of control, location, and assignment duration decisions as determinants of GVC structure, and the core ideas of the complementary global factory and the smile of value creation perspectives. We then describe how the need for flexibility (or stability) is an additional causal driver of the organizational decisions, and particularly the assignment duration decision, leading to our propositions for the updated model of the efficient GVC. A discussion and summary section concludes.

2. CONTROL AND LOCATION IN GVCs AND GLOBAL FACTORIES

The growing literature on GVCs and global factories emphasizes two leading factors that drive the optimizing decisions of a multinational firm with respect to its value chain activities: control and location (Bair, 2008; Buckley, 2004; Buckley & Ghauri, 2004; Gereffi, Humphrey, & Sturgeon, 2005; Gibbon et al., 2008; Mudambi, 2008; Ponte & Gibbon, 2005). The centrality of the control

and location questions is due in large part to the efforts of MNEs to capture increasing value through cost-efficient production while overcoming liabilities of foreignness through the possession and control of intangible, knowledge-based assets (Buckley & Casson, 1976; Hymer, 1960; Kogut & Zander, 1993).

2.1 Control

Control decisions, which establish the governance structure of the firm's value chain, i.e. whether each activity should be internalized or outsourced, emerge from the application of transaction cost analysis (Coase, 1937; Williamson, 1975), and are particularly important for MNEs as they engage in global outsourcing (Buckley & Casson, 1976). Additionally, while non-ownership forms of control (e.g. joint ventures) are increasing in importance, the Coasean "externalize or internalize" choice is at the heart of the control decision (Buckley, 2009a, 2011). As the costs of coordinating and enforcing market transactions increase, firms obtain benefits from internalizing value chain activities through which they can appropriate the most value, while externalizing operations in which they can create and appropriate less value. Advances in communications, information technology, and transportation have enabled both the 'finer-slicing' and dispersion of value chain activities, and the improved monitoring and enforcement of outsourced transactions. Accordingly, firms simultaneously disaggregate their value chains and select activities over which to maintain control, making it crucial to identify and internalize those activities over which they have a competitive advantage (Prahalad & Hamel, 1990), and where the costs of using market transactions are relatively high and outsourcing is unattractive (Mudambi, 2008). Classic studies of supplier relations (e.g. Monteverde & Teece, 1982) indicate that technologically sophisticated, specialized activities tend to be retained in-house, while simpler, standardized activities are most often

outsourced, although the increasing sophistication of specialized suppliers in many industries (e.g. pharmaceutical contract services) are changing this traditional outsourcing model (Dunlap et al., 2016; Van Arnum, 2012).

2.2 Location

In addition to analyzing their value chain activities to determine a preferred control arrangement, firms must also identify the most advantageous geographic locations for labor costs, knowledge abundance, and other factors where production activities can be distributed to generate the greatest value (Dunning, 1988). Improvements in public policies, infrastructures, technologies, and other resources in a wide range of emerging markets have dramatically increased the number of locations where value chain activities can be effectively performed (Gereffi et al., 2005; Mudambi, 2008). The opening up of the global factory has enabled firms in emerging markets such as China, Vietnam, India, and Turkey to compete for business against the internalized activities of the MNE, subjecting each internalized activity to 'the market test' in which the principles of least cost dominate (Buckley, 2009a).

Although processes of catch-up, spillover, and industry creation are impacting the current pattern of activity location in GVCs, high value-adding specialized activities are still predominantly performed in knowledge-abundant advanced market economies, while low value-adding standardized activities are predominantly performed in labor-abundant emerging market economies (Kumaraswamy, Mudambi, Saranga, & Tripathy, 2012; Mudambi, 2008; Shanley, 2015). Together, the control and location choices of MNEs in response to technology-enabled fine slicing and wider geographic dispersion of GVC activities serve to establish the physical structure

(core functions, distributed manufacturing, and local market adaptation) of the global factory depicted in Figure 1 (Buckley, 2009a).

**** FIGURE 1 ABOUT HERE ****

3. THE THIRD KEY ORGANIZING DIMENSION: TIME

A valid conjecture is that the time dimension and the relevant decision variable, assignment duration, have received limited direct or explicit attention because they are actually subsumed within either or both control and location decisions already. A broad and deep review of the literature on GVCs suggests otherwise. The predominant starting point of many articles is that modern global strategy amounts to the optimal disaggregation of the value chain, followed by decisions as to how each slice should be allocated geographically (offshoring) and organizationally (outsourcing) or, respectively, the location decision and the corporate boundary decision (Contractor et al., 2010). Offshoring and outsourcing represent the strategic intent to configure production systems and organizational structures to establish "which transactions go where and why" (Liesch et al., 2012); for each activity or operation of the GVC, managers focus on where to perform it, and whether to perform it within the firm or outsource it (Contractor et al., 2010). Outsourcing "represents the fundamental decision to reject the internalization of an activity" (Verwaal, Commandeur, & Verbeke, 2009: 421), and most research on offshoring has focused on why firms offshore particular activities, the governance modes they choose, the locations they select to host the offshored activities, and the outcomes they achieve (Larsen, Manning, & Pedersen, 2013). Yeung and Coe (2015) propose that the competitive dynamics or 'causal drivers' of global production networks lead to four observable strategies that reflect ownership and

geographic decisions but do not reflect duration: domestic expansion, outsourcing, joint development with suppliers, and differentiated integration into global production systems.

These and other works highlight the importance of examining which transactions go where and why, but generally do not discuss or allude to the key question of "for how long and why?". Instead, the predominant focus has been on the decisions of control and location themselves. Notable exceptions by Buckley (2011) and Liesch et al. (2012) argue that flexibility and the need to revisit and change location and control decisions on a continuing basis allow for more precise geographic and ownership strategies, which have become increasingly important to MNEs facing volatile, risky, and dynamic situations. Some prior studies have examined in varying degrees elements related to time, timing, and flexibility in control and location decisions, but not in the sense of assignment duration proposed here. For example, Gereffi et al. (2005) consider value chain activities where the inputs are time-sensitive or to some degree perishable, requiring the processes as a whole to be better coordinated as synchronized flows. Similarly, Contractor et al. (2010) discuss timing in outsourcing decisions as the sequential coordination of globally dispersed value chain activities. Indeed, the focus on control and location has provided innumerable theoretical and empirical benefits to GVC research, but two areas that have received less attention are the length of time that the chosen control-location settings are intended ex ante to remain in place, and why this decision should matter.

4. THE CONCEPTUAL STRUCTURE OF GVCs

4.1 GVC Activities: Standardized vs. Specialized

GVCs consist of activities and actors. At the most general level, activities in a GVC may be classified as 'standardized' or 'specialized'. All GVCs contain standardized and specialized activities, and these differ significantly in terms of their contribution to value creation (Mudambi, 2008). Standardized activities are repetitive, low value-adding commoditized activities that can be set up and performed by many firms using limited knowledge-based resources. Examples include bulk finished goods assembly and large-batch production of components and products with relatively simple and/or stable designs, such as the contract manufacturing of aspirin and other small molecule generic pharmaceuticals (Shanley, 2015). Sewing operations in Li & Fung's GVCs are another example; factories in emerging economies, which may often consist of just sewing machines on tables, can appear and disappear overnight (Urbina & Bradsher, 2013).

Specialized activities, such as design, R&D, advanced manufacturing, and marketing, are the most valuable activities in a location both in terms of per-capita income generation and new industry emergence (Mudambi, 2008). These high value-adding activities are typically associated with the intangible components of the product or service, and are directly or indirectly related to R&D knowledge (at the upstream end of the GVC) or marketing knowledge (at the downstream end). The design and manufacture of advanced structural components for Boeing's 787 aircraft by its suppliers (Kotha & Srikanth, 2013), and the provision of specialty storage, handling, and cold chain logistics services by pharmaceutical contract manufacturing organizations (Haigney, 2016) are examples. In this context, specialization refers to the extent of non-repetitious knowledge

deployed, e.g. the creation of new knowledge via exploration activities at the upstream end of the GVC.

4.2 Frameworks of Organization: Global Value Chains and Global Factories

As activities, tasks, and their related profits are increasingly dispersed across firm and national boundaries (Kenney & Florida, 2003; Mudambi, 2008; Seppälä, 2013), the global economy is transforming from one dominated by 'trade in goods' to one dominated by 'trade in activities' (Mudambi, 2013). These trends and the resulting disintegration of trade and production in the world economy have been conceptualized and explained by several frameworks and perspectives, including global value chains (Gereffi, 2011; Gereffi et al., 2005), global factories (Buckley, 2004; Buckley & Ghauri, 2004), global commodity chains (Gereffi, 1994; Gereffi & Korzeniewicz, 1994), and global production networks (Bair, 2008; Coe et al., 2008; Hess, 2008; Hess & Yeung, 2006). We examine and integrate the global value chain and global factory frameworks below.

4.2.1 Global Value Chains: The functional model of global economic activity

Value chain analysis is an innovative tool that views the economy in terms of activities instead of its constituent industries and firms (Mudambi, 2008). Value chain analysis can be traced to early work focused on disaggregating the individual business firm into its constituent activities with the objective of identifying its sources of competitive advantage (Porter, 1985). The firm-centric focus of this work has been extended and generalized in recent years to analyze the overall creation of value in micro- and macro-settings. Modern value chain analysis enables us to pinpoint the relative contributions to value creation associated with each activity. At the sector level, the value chain approach analyzes each link in the 'chain of activity' - from the ideation of a product or service to

raw materials and component supply, production, delivery to buyers, and often beyond that to disposal and recycling. This approach helps us to understand that as far as a geographic location is concerned, success in terms of creating prosperity is based on the activities performed in the location rather than the identity of local firms or industries. When these activities are disaggregated and dispersed across national borders, a GVC exists. The GVC framework (Gereffi et al., 2005) emphasizes the globally-organized, buyer- and producer-driven chains of activities that form the production and distribution systems created by vertically integrated transnational manufacturers.

GVC theory focuses on the increased value able to be obtained by MNEs, arising from knowledge and wage differentials, as they reconfigure the standardized and specialized activities of their GVCs across geographically-dispersed networks of suppliers (Mudambi, 2008). Coasean logic asserts that a firm should retain control over the activities and operations in which it creates and can appropriate the most value, while outsourcing to others those activities in which it creates or can appropriate less value (Prahalad & Hamel, 1990). Accordingly, by continuously reconfiguring the geographic distribution of GVC activities, orchestrating firms (MNEs and their dominant subsidiaries) exploit the persistent differences in skill and labor markets to capture increasing value from their overall operations (Buckley, 2009a).

4.2.2 Global Factories: The structural model of global economic activity

The institutional form known as "the global factory" was identified by Buckley (2004) and further developed by Buckley and Ghauri (2004). The global factory framework emphasizes the changing structural characteristics of multinational firms (orchestrators) as they are increasingly able to

coordinate globally dispersed value chain activities through a more precise use of ownership and location strategies (Buckley, 2009a, 2011).

Global factories embody the vertical, structural organization of GVCs and are divided into three parts [Figure 1]. These include upstream core functions related to brand development (product design, engineering, branding, and marketing), distributed manufacturing (component supply and finished goods assembly), and downstream local market adaptation (differentiation, warehousing, and distribution). In a service-based global factory, service hubs and outsourced goods suppliers would replace the contract assemblers and outsourced parts suppliers in Figure 1, respectively. The strategies of MNEs to orchestrate the complex arrangements of GVC activities are of primary importance to understanding the nature of the global factory.

4.3 The Smile of Value Creation: A Model of Control and Location Decisions in Global Factories

Control and location choices in GVCs are implicitly captured on the vertical axis of Mudambi's (2008) "smile of value creation", which provides the critical link connecting the functional aspects of the GVC perspective and the structural aspects of the global factory perspective [Figure 2]. This unifying 'smile' framework identifies the pattern of value generated throughout the GVC, by integrating the forces driving the disaggregation and dispersion of production activities with the control and location decisions of global factory organization. In addition to explaining the forces behind catch-up, spillover and industry creation (Kumaraswamy et al., 2012; Mudambi, 2008), the 'smile' predicts the organizational and spatial configuration of GVCs and global factories. In this framework, the y-axis implicitly represents the likely control and location choices across the

spectrum of activities. The efficient global factory will tend to internalize the specialized, high value-added activities of the GVC, and outsource the standardized, low value-added activities.

**** FIGURE 2 ABOUT HERE ****

Additionally, knowledge-intensive specialized activities are still predominantly performed in advanced market economies, while low-knowledge standardized activities are predominantly performed in emerging market economies (Mudambi, 2008). For example, Apple's design centers in the Silicon Valley, Austin, Texas, and elsewhere generate new upstream knowledge and product designs that are almost exclusively sourced and manufactured in bulk by parts suppliers and contract manufacturers in China, and then advertised by Apple's in-house marketing team and ad agencies based in New York and San Francisco (O'Reilly, 2017; Reisinger, 2016).

To summarize, specialized activities at the 'ends' of the smile (e.g. R&D, design, and marketing) will tend to be internalized and located in advanced market economies, whereas standardized activities in the 'middle' of the smile (e.g. high volume manufacturing and bulk assembly) will tend to be outsourced and located in emerging market economies. These relationships, which explain the potential for value creation from different control and location choices and by extension the organizational structure of the efficient global factory, are conceptually depicted in Figure 3.

**** FIGURE 3 ABOUT HERE ****

4.4 Change and Value Creation: Flexibility, Stability, Learning, and Trust

In addition to the organizational and spatial dimensions, it is important to recognize the temporal dimension of GVCs. Changes in consumer preferences, technologies, and levels of competition will cause GVCs to continuously evolve, and the nature of the global factory will vary over time and space (Buckley, 2009a). Such changes are prompted by the unyielding development of new technologies which must be learned and integrated into the GVC, the accompanying 'de-specialization' or transformation of previously specialized activities into standardized activities, and the continuous emergence of lower-cost suppliers and locations. GVCs are rarely in a state of equilibrium; the location and control decisions that drive their structures are often made under volatile, risky, and dynamic conditions, and must be revisited by managers on a continuing basis and in response to exogenous shocks (Buckley, 2011). The pattern of GVC activity (captured by the smile of value creation) generally places high value, specialized activities in advanced market economies and low value, standardized activities in emerging market economies. This pattern, however, is under pressure to continuously change as emerging market firms strive to develop capabilities for high value-added activities ('catch-up'), as advanced market firms disaggregate and relocate standardized activities to emerging markets ('spillover'), and as innovation creates new activities that de-specialize and displace old activities (Kumaraswamy et al., 2012; Mudambi, 2008). Continuous adaptation of GVCs to these changing environmental conditions is achieved by assigning different control and location settings for each activity, but the duration of these arrangements is not fixed. Rather, the control and location settings are contextually dependent, and must be temporally assigned in varying durations to provide the level of flexibility and/or stability that generates the highest overall value for the GVC.

4.5 Creating Value in Short-Term and Long-Term Assignments

The dynamic nature of global competition calls for organizations to be efficient, innovative, and flexible, favoring less binding relationships to avoid long entanglements when faced with greater environmental uncertainty (Young-Ybarra & Wiersema, 1999). Flexibility is a key attribute in the organization of global factories, and provides orchestrating firms with the ability to rapidly reconfigure activities among suppliers and locations to capture increasing value as the GVC evolves (Buckley, 2009b, 2011). This includes the ability to quickly switch suppliers and locations as more efficient, lower-cost options emerge. In addition to its network of suppliers in China, Vietnam, Bangladesh, Indonesia, and India, Li & Fung Limited maintains relationships with thousands of other suppliers in major and secondary production countries for periodic short-term capacity balancing, and flexible quick-response contingency production (Urbina & Bradsher, 2013). Flexibility also provides resilience to absorb external shocks (e.g. the 2011 Japanese earthquake and tsunami, and the 'sub-prime' crises of 2008-2009), the effects of which are rapidly transmitted throughout the integrated global economy. The value-increasing benefits of flexibility can be achieved through short-term, low-commitment assignments and reassignments of GVC activities.

However, value can also be created as capabilities are enhanced through organizational learning and the development of trust, which require longer-term, stable relationships and higher levels of buyer-supplier commitment and interaction to achieve. Suppliers to Boeing and Pfizer routinely invest substantial amounts of time and money to create the highly specific assets that are necessary to maintain their multi-year, high-technology supply contracts (Gardiner, 2007; Van Arnum, 2012). Organizational learning enhances the ability to innovate in environments characterized by

high levels of uncertainty (Argote & Miron-Spektor, 2011; Fang, Lee, & Schilling, 2009; March, 1991; Schilling, Vidal, Ployhart, & Marangoni, 2003), and the development of trust between buyers and suppliers reduces the likelihood and costs of supplier opportunism (Crook & Combs, 2007; Ireland & Webb, 2007; Mudambi & Helper, 1998; Woolthuis, Hillebrand, & Nooteboom, 2005). The value-increasing benefits of learning and trust can be achieved through long-term, stable assignments of GVC activities.

The definitions of "short-term" and "long-term" will vary with industry and other contextual factors. Previous studies have found long-term contracts to cluster in discrete intervals of three to ten years, and contract with lengths up to two or three years have been designated as short-term (Susarla, 2012; Susarla, Subramanyam, & Karhade, 2010). Pfizer's deals with its contract research organizations (e.g. Icon and Parexel) are estimated by analysts to range from three to five years (Fassbender, 2016a). Li & Fung's core group of suppliers remain regularly active with two-year order placements, but shorter-term production arrangements are made as needed with many other quick-response contingency suppliers (Li & Fung Limited, 2016). And although terms are not made public, Boeing's suppliers (e.g. Mitsubishi Heavy Industries and Kawasaki Heavy Industries) can typically expect production runs for planes using their key structural components to last over 20 years (Gates, 2007).

4.6 Organizing for Value Creation

The ability to generate value via both short- and long-term assignments prompts important questions for managers and researchers: Which activities of a GVC are the most likely to generate increased value from cost reductions and rapid reconfigurations, and should therefore be organized

via more flexible, shorter-term relationships? And, which activities of a GVC are the most likely to generate increased value from organizational learning and the development of trust, and should therefore be organized via more stable, longer-term supply relationships? Research on organizational learning (e.g. Fang et al., 2009; March, 1991; Schilling et al., 2003) indicates that while efficiency quickly improves with repetition in performing single, standardized tasks (Smith, 1776), variation in task assignments is critical to developing new capabilities, increased absorptive capacity, and long-term productivity. Task variability enhances extended learning through the development of deeper cognitive structures over time that can be applied to multiple types of problems, including those "fuzzy", open ended strategic issues (Schilling et al., 2003) that are characteristic of the creative upstream (R&D and design) and downstream (marketing) activities in the GVC (Mudambi, 2008).

The availability and accessibility of low cost labor around the world has increased dramatically due to improvements in emerging economies' infrastructures and trade policies, as well as technological advances in communications, information technology, and transportation. As the number of locations in which standardized activities can be effectively performed increases, downward pressure on unit labor costs compels global factory managers to pursue increased value by sourcing these activities, both initially and on a continuing basis, from the lowest cost suppliers. In a cost-competitive environment, being 'locked in' or otherwise committed to a particular supplier relationship over an extended period of time reduces flexibility (Young-Ybarra & Wiersema, 1999), and can prevent the orchestrating firm from capturing additional value as other lower cost supply options subsequently emerge. By contrast, shorter-term assignments provide value-adding flexibility to continuously reduce costs through rapid transitions to more

competitively-priced control-location configurations. Indeed, sourcing strategies in which transitions from primary suppliers that are no longer the clear choice are common, and buyers often develop a 'harem of suppliers' to call into service as environmental conditions change (Mudambi & Mudambi, 1995).

Scholars have argued, however, that it is problematic to exclusively assume that the more flexibility in supply chains, the better; stability in sourcing relationships can also be beneficial (Stevenson & Spring, 2007). Value is also created by enhancing an organization's advanced knowledge and creative problem-solving capabilities, which enable it to discover, evaluate, and exploit opportunities for innovation through specialized, non-repetitive activities such as R&D, product design, and marketing. Whereas standardized activities require basic knowledge and capabilities that can be taught, replicated, and redistributed with relative ease, specialized activities involve uncertain means-ends relationships and 'sticky' intangible resources that are resistant to transfer (Szulanski, 2000). Unlike their standardized counterparts in the value chain, specialized activities require more extensive interaction between transacting parties to achieve greater flows of tacit knowledge, learning, and the development of trust, which may be impeded if the sourcing relationships are characterized by low levels of commitment and frequent assignment changes that are associated with short-term contracts. Strong networking relationships with frequent communication and cohesive structures have a positive effect on knowledge transfer between parties (Reagans & McEvily, 2003). With longer-term, more stable assignments, both buyers and suppliers have greater opportunities to interact and share problem-solving knowledge, generate 'economies of learning', and build social ties and trust.

5. BEYOND LOCATION AND CONTROL: ASSIGNMENT DURATION

Since increasing value can be obtained through both short-term assignments and long-term assignments, managers of global factories are faced with a third key decision for each activity – assignment duration. Beyond the critical location and control decisions discussed above, this important choice for the organization of the efficient GVC is, therefore, which activities should be organized with short-term assignments, and which activities should be organized with long-term assignments? Logically, activities of the GVC should be organized along this dimension in the way that creates the most value given the attributes of each activity type.

On the one hand, standardized activities (e.g. contract manufacturing, bulk assembly, and component supply) involve tangible, low-knowledge, commoditized components that can be shifted quickly to an increasing number of capable suppliers. These activities benefit greatly from the flexibility provided by rapid reorganization via spot market transactions. If these activities are organized under long-term assignments, value creation may be reduced by locking in the buyer with the supplier, reducing flexibility to easily shift to lower-cost suppliers that emerge as the GVC evolves (Young-Ybarra & Wiersema, 1999). Moreover, these low-knowledge, easily-replicated activities require less time to learn and will benefit less from the extended time and enhanced buyer-supplier interaction provided by long-term assignments.

On the other hand, specialized activities (e.g. R&D, design, and marketing) involve intangible components, creativity, and high levels of tacit knowledge. Moreover, these high-knowledge, high-skill activities are effectively performed by relatively fewer firms. Specialized activities require greater time to learn and more extensive buyer-seller interaction for the transfer of tacit

knowledge and the benefits of learning and trust to occur. This insight suggests that among specialized activities, longer-term assignments that facilitate learning and trust development will be predominant, while shorter-term assignments which decrease the opportunity for learning and trust development should be less prevalent. The nature of this third key decision of global factory organization - assignment duration - is reflected in the model in Figure 4.

**** FIGURE 4 ABOUT HERE ****

6. ASSIGNMENT DURATION AND ACTIVITY COMPLEXITY

Assignment duration is likely to be correlated with the activity complexity and asset specificity present in the buyer-supplier relationship. The promise of longer term interaction in a buyer-supplier relationship can mitigate the potential for underinvestment by the supplier in relationship-specific assets, and gives incentives to the vendor to invest in learning about and from the client organization (Susarla et al., 2010). Exclusivity clauses associated with long-term contracts, i.e. restrictions on redeploying investments to the "next-best" alternative, can also strengthen incentives to the vendor to make client-specific investments (Brickley, 1999; Whinston, 2001) that enable the development of trust and transfer of tacit knowledge. Numerous depictions of the relationship between outsourcing task complexity and assignment duration are found in the literature, including Boeing's 20-year production agreements with its key structural component suppliers for the 787 Dreamliner (Gardiner, 2007), JPMorgan's doomed seven-year IT outsourcing agreement with IBM (Overby, 2005), and Li & Fung's extensive supplier network and manufacturing flexibility (Li & Fung Limited, Annual Report 2016).

6.1 Complexity drives Duration in the Pharmaceutical Contract Services Industry

The global pharmaceutical contract services industry effectively illustrates our ideas and provides a fertile environment for further research in this area. As the competitive, investment, and regulatory landscapes of the pharmaceutical industry changed throughout the 1990s and 2000s, disaggregation and dispersion of GVC activities by orchestrating MNEs to independent suppliers increased significantly (Dunlap et al., 2016; Miller, 2017a). This growth has been particularly strong in Asian economies where governments have focused on attracting pharmaceutical activities as political and economic priority areas (Fassbender, 2017), but the capabilities of US- and Europe-based suppliers are still more advanced than their Asian counterparts (Shanley, 2015). Contract research organizations (CROs), contract development and manufacturing organizations (CDMOs), and contract manufacturing organizations (CMOs) have emerged to become critical components in the outsourcing strategies of large pharmaceutical (and more recently, biotechnology) orchestrating firms. In general, CROs perform specialized R&D activities, CMOs perform standardized manufacturing activities, and CDMOs perform a combination of both specialized development and standardized manufacturing activities within these GVCs.

In addition, the processes to develop, manufacture, and distribute drugs - and the drugs themselves – can be categorized as either specialized or standardized. “Large molecule” biological drugs are large, unstable, and complex compounds that are often produced in heterogeneous, genetically engineered cells. These specialized drugs are costly and more challenging to manufacture, handle, and store than their counterpart “small molecule” drugs (e.g. aspirin) which are simple, well-defined compounds that are produced by stable, predictable, and less expensive chemical synthesis processes (GaBiOnline, 2012). Among the most advanced breakthrough biological drugs for

treating cancer are antibody drug coagulates (ADCs), which can attack cancer cells directly without damaging the surrounding healthy cells. The highly complex nature of these drugs and the processes to create them require a combination of diverse sets of specialized knowledge and capabilities that reside separately in the outsourcing firm and the CRO supplier. Combining this knowledge requires strategic partnerships that can provide a level of collaboration, trust, respect, and learning not typically needed to develop traditional therapeutics, and accordingly teams from both organizations are typically collocated with their equipment for extended periods of time (Spriggs, Mowery, & Kowalcyk, 2015).

6.2 Trends impacting Outsourcing Strategies

Several noteworthy trends have been identified by industry observers. First, pharmaceutical firms are increasingly outsourcing more of their in-house specialized GVC activities to contract firms (Haigney, 2016). As a result, the number of CROs providing upstream specialized R&D services is growing and expected to continue increasing over the next decade. In addition to this apparent de-specialization of certain types of R&D, more CROs and CDMOs are expanding their standardized and specialized capabilities to become ‘one-stop-shops’ that provide broader ranges of services to secure a greater share of their clients’ outsourced activity (Van Arnum, 2012). This in turn is driving a surge in M&A activity and market consolidation as supplier firms seek to expand their range of GVC capabilities (Miller, 2017b). Second, the pharmaceutical outsourcing market has bifurcated into two major segments as it has matured: innovation-driven suppliers that offer the most sophisticated and wide-ranging capabilities, and capacity-driven suppliers that focus on standardized, undifferentiated, high-volume capabilities for older products and generic drugs. While the preference for longer-term, strategic partnering with one-stop-shop suppliers is

increasing, relationships with second-tier CMOs for specific standardized services are becoming even more transactional based on the short-term customer benefit of a lower price (Van Arnum, 2012). And third, while the majority of pharmaceuticals currently produced are still of the small molecule type via standardized processes, the development of complex, large molecule biologics and gene-based products is increasing (Fassbender, 2016b; Shanley, 2015). As a result of this proportional shift to more specialized products requiring specialized activities, longer-term strategic partnering arrangements with more sophisticated suppliers is increasing as well.

These trends suggest that in addition to control and location, assignment duration is and will remain an important managerial consideration in the organization of pharmaceutical GVCs, and that these decisions are based on activity complexity. Empirical research in other and more defined contexts will better explain the intricacies and conditions impacting assignment duration decisions, but we suggest that several relevant insights emerge from this parsimonious example.

First, as the scope of activities demanded by orchestrating firms (and able to be provided by suppliers) has shifted to include more specialized activities, the preference for strategic one-stop-shop relationships has also increased. In other words, specialized activities are being assigned by orchestrators to longer-term, more stable arrangements. Second, as the supplier market bifurcates into innovation-based, preferred suppliers that offer broader ranges of services and capacity-based standardized suppliers, the transactional relationships with second-tier high-volume CMOs are becoming even more transactional. In other words, standardized activities are being outsourced by orchestrators to a growing number of narrowly-focused, high-volume providers with shorter-term assignments on a case-by-case basis. Third, while outsourcing is expanding globally, the location

choice is influenced by the type of activity in question. The activities being outsourced to India and China are mainly related to commodity APIs (active pharmaceutical ingredients) used in over-the-counter and generic drugs. The outsourcing to US- and Europe-based suppliers is for later-stage molecules, and complex, highly-potent APIs (Shanley, 2015).

And finally, as the proportion of specialized biologic drugs in market increases, there will be a corresponding de-specialization of specialized activities as more suppliers in advanced and emerging economies achieve advanced capabilities, and as new specialized activities are developed in-house and subsequently outsourced. For example, industry analysts recently observed that Pfizer's contract renewals with at least one of its CROs were expected to be of shorter durations due to the rebalancing of business among additional suppliers (Fassbender, 2016a). We expect this ongoing cycle to be continuously reflected in the organizing strategies that are currently distinguishable by control, location, and assignment duration choices.

Therefore, because assignment duration is a choice that can impact value creation, and is distinct from location and control choices, we initially propose:

> **Proposition 1:** Value creation in GVCs is a function not only of the control and location decisions, but also the assignment duration decisions made for each activity.

6.3 Extending the Smile of Value Creation: Assignment Duration

Control and location choices are implicitly captured on the vertical axis of the 'smile of value creation', which integrates the GVC and global factory perspectives. In this framework, specialized high value-added activities (e.g. R&D, design, and marketing) will tend to be internalized and located in advanced market economies, whereas low value-added activities (e.g.

high volume manufacturing and bulk assembly) will tend to be outsourced and located in emerging market economies. We argue that the 'smile' framework also provides a solid theoretical foundation for the analysis of assignment duration in GVCs. We surmise, also, that while repetitive standardized activities are subject to rapid gains in efficiency, the economies of learning will be limited to a relatively narrow range and that the potential value generated will diminish as the assignment duration increases. Conversely, while specialized activities related to intangible elements of the GVC may be slower to generate value due to their complex and uncertain nature, the task variability will offer greater economies of learning and increasing value that can be captured as the assignment duration increases. We propose therefore that specialized activities at the ends of the smile will tend to be organized under longer-term, stable arrangements, while standardized activities in the middle of the smile will tend to be organized under shorter-term, flexible arrangements.

Applied to the question of GVC and global factory organization, this insight suggests that the specialized activities related to core functions and local market adaptation – the ends of the smile – will not only be internalized and concentrated in advanced market economies, but will also be characterized by more stable, long-term assignments that enable gains from economies of learning from current suppliers to accrue. The repetitive, standardized manufacturing activities – the middle of the smile – will tend to be externalized, concentrated in emerging market economies, and characterized by more flexible, short-term assignments that enable cost savings from rapid reconfiguration to more efficient, emerging suppliers to accrue. We propose the following (summarized in Table 1):

Proposition 2a: In efficient global factories, the specialized, knowledge intensive, and creative activities of GVCs (at the ends of the smile) will tend to be internalized, located in advanced market economies, and organized as relatively long-term, stable assignments.

Proposition 2b: In efficient global factories, the standardized, low-knowledge, and repetitive activities of GVCs (in the middle of the smile) will tend to be outsourced, located in emerging market economies, and organized as relatively short-term, flexible assignments.

7. DISCUSSION AND CONCLUSION

The integration of the modern global marketplace presents firms of all sizes with an increasing number of organizational challenges and opportunities for profitability and growth (Liesch et al., 2012). While significant progress has been made in clarifying the complex nature of outsourcing and offshoring strategies in the last several decades, the need for a refined research agenda (GPN 2.0) has been identified (Yeung & Coe, 2015). In this paper, we offer an original approach to understanding and explaining GVC organization, and a useful set of propositions to guide further exploration. We push this emerging research agenda beyond its traditional yet limited comfort zone of control and location explanations towards a more thorough coverage of the factors involved in the decision making questions addressed by global managers. Specifically, we call attention to the inherently temporal nature of GVCs that has been relatively ignored in the literature, and link this underresearched dimension directly to the underlying complexity and asset specificity of each value chain activity. We assert that as the complexity of a value chain activity increases, it requires a greater degree of interaction – time to learn, develop trust, and collaborate – between the outsourcing firm and its supplier to achieve the intended efficiency of the outsourcing arrangement. Conversely, as the complexity of a value chain activity decreases, the benefits from extended interaction are diminished and the driver of efficiency in the outsourcing

relationship becomes the flexibility provided by short-term arrangements, which enable cost reductions through the exercise of options to quickly switch to lower-cost suppliers that should inevitably emerge.

To build our case and propel the new agenda forward, we link together in a novel way several theoretical perspectives that have developed along parallel lines. We revisit and integrate theories of the global factory (Buckley, 2004; Buckley & Ghauri, 2004) and global value chains (Gereffi et al., 2005) - which offer complementary insights into why offshoring and outsourcing challenges and opportunities occur, and how managers address them as the nature of global competition continues to evolve. Arguably, although there are nuanced differences between the GVC and global factory approaches, they are in many ways overlapping and can be seen as two sides of the same coin. As such, both theories provide different yet complementary perspectives that when combined can enhance our understanding of the intricacies and changing nature of global economic activity. We engage the 'smile of value creation' (Mudambi, 2008) in a new way as the unifying framework that connects these theories and reveals the pattern of value generated throughout the GVC. We ground our discussion by including multiple practical examples of firms in different industries; these serve not only to illustrate and reinforce our conceptual argument, but can also stimulate the future discovery and investigation of other examples and counter-examples.

Although prior studies in this and other areas have examined various concepts related to time, timing, and flexibility as they pertain to outsourcing arrangements, we contribute to the outsourcing and offshoring literature by providing what we believe to be the initial logical argument that specifically and unambiguously identifies assignment duration as the third critical

decision in GVC organization. Our review of the literature on GVCs and related areas suggests that control and location remain, with few exceptions, the two areas of focus for most research. Flexibility (or stability) within a GVC contracting arrangement can be present in varying degrees regardless of the control and location settings, and there have been multiple interpretations of this which differ from what we propose.

For example, Moretto and Rossini (2011) examine 'flexible outsourcing' and 'vertical flexibility' as the ability of a firm as a whole to switch from one outsourcing arrangement to another, which can include outsourcing or backsourcing. They analyze the timing of a make-or-buy decision and the option to reverse this decision, but do not discuss the duration of each value chain activity as we propose. Scholars are also examining time, timing, and related concepts of flexibility in temporary organizational forms (Stjerne & Svejenova, 2016), interorganizational projects (Ligthart et al., 2016), and "project-based firms" (Hobday, 2000; Sydow, Lindkvist, & DeFillippi, 2004) to a greater extent, due to their increased occurrence in a broad range of industries such as construction, film-making, human resources, new product development, and software development (Bakker, 2010; DeFillippi & Arthur, 1998; Lakemond & Berggren, 2006; Zwikael & Unger-Aviram, 2010). These types of organizations are established to achieve pre-defined goals and are characterized by an ex ante defined limited time of interaction between members, but their connection to GVCs is not the focus of this research. An intended contribution of our paper is to lay the groundwork for future connections between the conceptual and empirical research on GVCs and these fields.

Future research in this area should focus on the development of testable hypotheses and the identification of various contexts in which the proposed relationships would most likely be exhibited for empirical testing. Quantitative data would necessarily require at a minimum a measure of the specialization/standardization of outsourced value chain activities, and the ex ante specified duration (in days, months, or years) of each activity assignment. The contextual differences of various high-technology industries (including pharmaceuticals, biotechnology, medical devices, and chemicals), can provide a rich environment for extensions of the present study. Here, we can look to previous studies for guidance. For example, Choi and colleagues (2017) examined the flexibility of outsourcing activities from a real options perspective in a sample of large firms in multiple industries as reported over a 20-year period in the Wall Street Journal. This approach can be effectively be replicated and combined with other data sources (e.g. surveys, case studies, the ClinicalTrials.gov database) to comprehensively examine the assignment durations of outsourcing contracts. Also, the effective categorization of high-technology firms and industries will be increasingly important; studies such as that conducted by Kile and Phillips (2009) to determine high-technology classifications (via 3-digit and 4-digit SIC codes) will provide a suitable starting point for exploration.

A benefit of the vast body of research performed in GPN 1.0 is that many of these contextual questions are likely to have already been addressed, either directly or indirectly, for the control and location decisions. This literature will undoubtedly serve as a basis for the inclusion of the assignment duration variable into the extant models; corresponding data may already be captured with little recognition of its importance given its prior lack of emphasis. Arguably, the stage of each industry will play an important role in the assignment duration decisions; more mature

industries such as chemicals will presumably be more involved in less innovative, standardized activities, whereas emerging and expanding industries such as pharmaceuticals and biotechnology will presumably be more involved in creative, specialized activities. However, the intraindustry variations in lifecycle stage will require diligence in the categorization of industries and subindustries for the analyses.

In addition to industry characteristics, the role of time is also likely to be an important factor in future research in this area. Today's specialized activities are tomorrow's standardized activities, so that activities that are internalized or organized in long-term arrangements today will transition to being organized in outsourced, short-term, flexible arrangements tomorrow. As innovation creates new activities that de-specialize and displace old activities (Kumaraswamy et al., 2012; Mudambi, 2008), the transitions of control, location, and assignment duration settings in GVCs will accelerate, particularly in industries characterized by fast clockspeed (Fine, 1998, 2000; Nadkarni & Narayanan, 2007; Souza et al., 2004), dynamism (Davis et al., 2009), and velocity (Eisenhardt & Martin, 2000), where specialized activities become standardized more quickly. Another intriguing time-related question that can be explored in future studies involves the sequencing of the outsourcing and offshoring decision making process: Are location, control, and assignment duration choices considered simultaneously, or sequentially? Does the simultaneity or sequence matter to GVC performance?

We acknowledge that this conceptual paper has limitations. In particular, the need for more empirical evidence moving forward is obvious as the interactions between control, location, and assignment duration decisions in GVCs are discussed and debated. Further research that explores

these proposed relationships and possible organizational variations, including the increased use of cross-sourcing from multiple suppliers as a hedge against supply disruptions (Mudambi & Mudambi, 1995), will enhance our understanding in this area. Our discussion and propositions encapsulate many complex ideas that are important to managers and scholars, and despite its shortcomings, we hope this effort provides a needed 'shorthand' to advance the conversation of GVCs as we proceeed further into the next phase of research and discovery.

Through our discussion we strive to identify points of intersection among the various globalization frameworks, which can serve as a basis for a deeper dialogue and further refinement, integration, and advancement of their concepts, rather than a criticism of their value or contributions. We hope that this initial push to formally recognize and include the temporal aspects of GVCs will inspire further investigation and debate, and ultimately yield a more complete picture of the nature of outsourcing and offshoring activity and the institutions and the firms that play - and aspire to play - central roles in global economic competition.

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Figure 1: The Three-Part Structure of the Global Factory (Buckley, 2009)

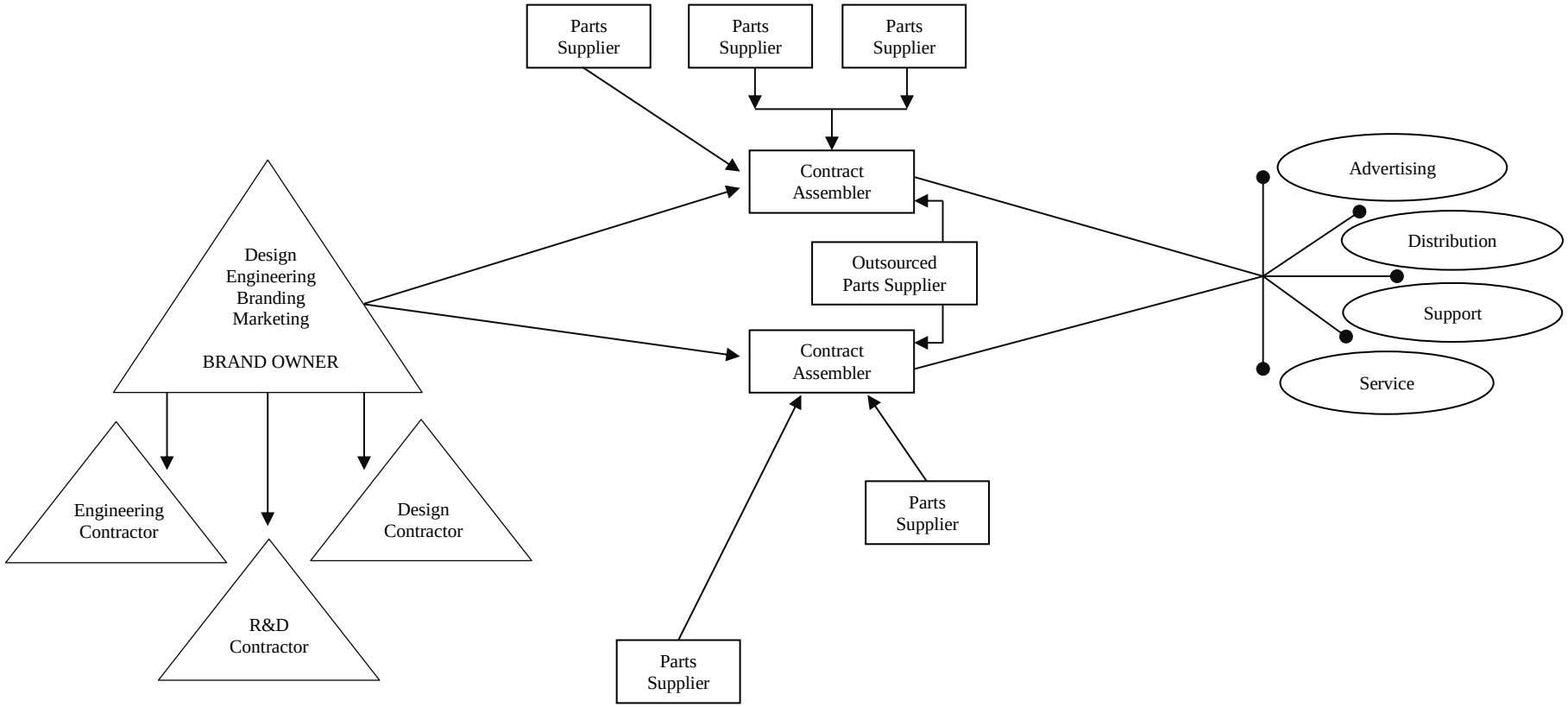


Figure 2: The Smile of Value Creation (Mudambi, 2008)

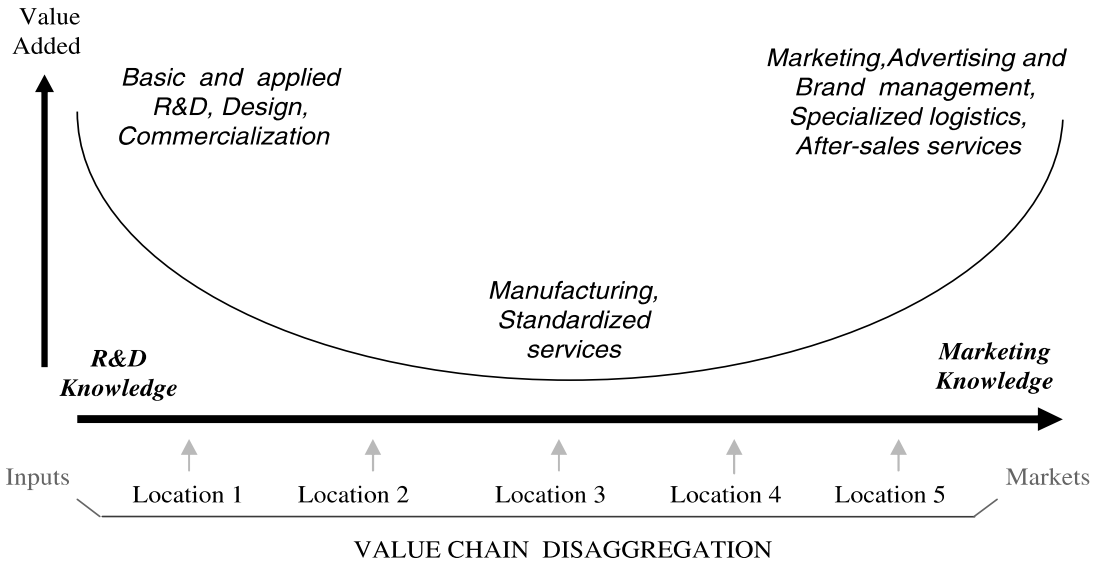
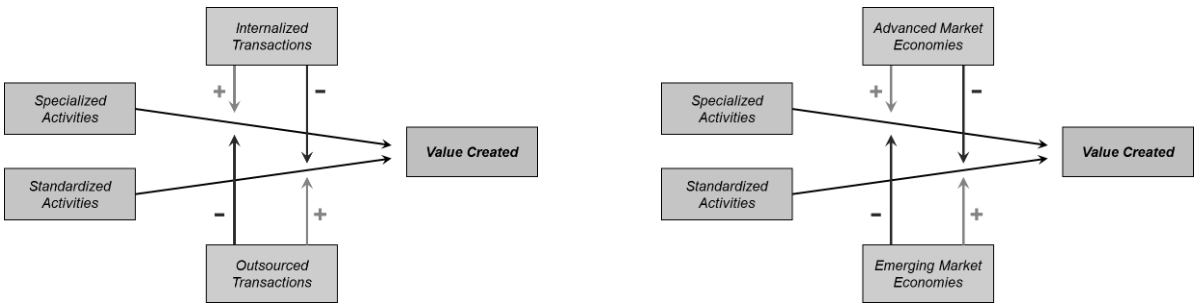
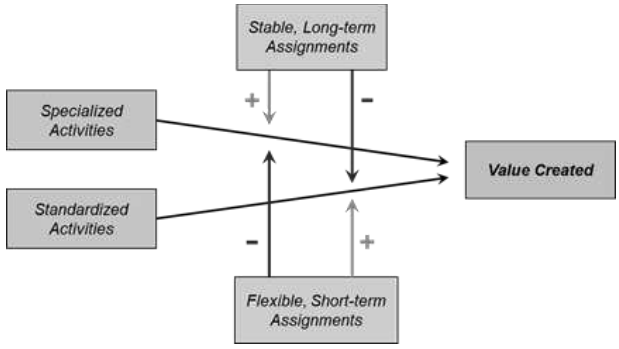


Figure 3: Control and Location Effects in the Efficient Global Factory



The 'Smile of Value Creation" (Mudambi, 2008) integrates the GVC and global factory perspectives, capturing the potential for value creation from the control and location decisions related to specialized and standardized activities.

Figure 4: The Assignment Duration Effect on Value Creation



Assignment duration is the third critical decision in the structure of the efficient global factory. Specialized activities, which require more time to learn, will generate greater value from organizational learning and the development of trust when organized via stable, long-term relationships. Standardized activities, which require less time to learn, will generate greater value from the ability to quickly reassign activities to emerging, low-cost suppliers when organized via flexible, short-term relationships.

Table 1: The Predicted Control, Location, and Assignment Duration Settings for the Efficient Global Factory

Organizational Choice: Control, Location, and Assignment Duration in Global Factory Activities			
	CORE FUNCTIONS	**DISTRIBUTED MANUFACTURING**	**LOCAL MARKET ADAPTATION**
Control	Internalized Transactions	Externalized Transactions	Internalized Transactions
Location	Advanced Market Economies	Emerging Market Economies	Advanced Market Economies
Assignment Duration	Stable, Long Term Assignments	Flexible, Short Term Assignments	Stable, Long Term Assignments