
Persistent variation: flexibility, organization, and strategy in the logistics of importing automobiles to the United States, 1980–99

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Abstract. The author presents case studies that reveal persistent variation in the logistics operations of firms importing new automobiles to the USA from 1980 to 1999. He argues that, in addition to the recognized differences such as national origin, product mix, and production organization, the strategic organization of logistics itself constitutes a basis for persistent variation. Firms operating at a global scale face heightened uncertainties in matching supply and demand and hence have a heightened requirement for flexibility. This is theorized in this paper as the ability to collect and transmit information, both codified and tacit, within and across various spatial scales. However, these informational goals imply very different organizational structures that are in tension. In ideal-type terms, firm organizational structures vary in the degree to which they are localized—referring to the intra-regional collection of information through horizontal relationships between the firm and external actors—or globalized—referring to the interregional transmission of information between portions of the firm. Persistent variation is the most likely outcome as firms constantly seek to reorganize their logistics operations in historically contingent, experimental, and contested ways.

Introduction

One of the legacies of the recent institutional and cultural ‘turns’ in economic geography has been the recognition of the existence and persistence of variety in the organization of economic activity within and across firms, regions, and nations (compare Berger and Dore, 1996; Christopherson, 2002; Gertler, 2001; Hill, 1989; Rantisi, 2002; Rees and Hayter, 1996; Schoenberger, 1997; Storper, 1997). What all this work challenges is a unitary paradigm that assumes that geographic variation is both relatively unimportant and likely to diminish over time as comparable economic activities converge towards a dominant mode of economic organization. The automobile sector has often been taken as emblematic in the unitary paradigm. Indeed, terms such as Fordism and Toyotaism that refer to the production systems of particular firms have been taken as representing larger systems of economic organization and regulation. However, books such as *The Machine that Changed the World* (Womack et al, 1990) have been increasingly criticized both for overstating the assumed neat progression from Fordism to Toyotaism and for portraying the production systems of the industry leaders as all-encompassing (see de Banville and Chanaron, 1999; Freyssenet et al, 1998). A key argument in the revisionist literature is the notion that firm strategy is embedded in dynamic economic and social systems that necessarily vary in time and space. We should thus expect firms in the same industry to differ “diachronically and synchronically” (Belis-Bergouignan et al, 2000).

Yet, the unitary paradigm continues to exert considerable influence, drawing on a variety of intellectual sources including, most recently, analyses that view the global economy as being increasingly constituted through an interregional network of information flows (see Castells, 1996). In emphasizing the globally connected nature of the

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emerging economic system, the network paradigm would seem to imply that the organization of interregional flows has become one of the primary forces behind the assumed convergence. In this paper I challenge the reassertion of the unitary paradigm by demonstrating that there are important and persistent variations in the organization of global information and goods flows by firms in the same sector and with the same national home base. Changes in technology, including communications and transportation technologies, do not arise evenly, they are not adopted evenly, and they are not understood as finished projects by those enacting them (Sabel and Zeitlin, 1997).

The logistics systems examined in this paper concern those organized by firms importing automobiles to the United States. What makes the shipment of automobiles so interesting in the unitary – variety debate is precisely the fact that the sector is one of the most globally integrated (Dicken, 1998; Sturgeon and Florida, 2000). In this paper I present a case study of the automobile import distribution system of Toyota and then contrast this to the distribution system of Honda, Mercedes, and Volkswagen. The first step in understanding the persistent differences between the firms is recognizing that logistics systems are integral components of the entire business, and hence what is efficient and coherent within one firm's home market, organizational structure, production system, product offerings, and so on may not be in another. Since the 1970s the market for new automobiles in the United States has been transformed by competition at a global scale. The implications for domestic firms have included reduced market share and ongoing restructuring, and foreign assemblers have faced pressures to reduce imports (see Bingham and Sunmonu, 1992; Rubenstein, 1992; Washio and Oki, 1992). All major Japanese and European assemblers (and most recently, Korean assemblers, not discussed in this paper) have opened one (or more) North American assembly plant. Today, 'foreign' cars and light trucks account for close to 30% of sales in the USA; however, imports represent a declining proportion of the US automobile market, down from almost 27% (or just over 4 million units) in 1987, to a low of about 11% (or about 1.7 million units) in 1996. Sales of imported vehicles recovered to about 3.1 million units (or an 18% share) in 2001.

However, each foreign automobile manufacturer has experienced, and responded to, these sectorwide changes differently, resulting *inter alia* in the observed variety in the logistics of automobile importing. For example, both Toyota and Honda have been very successful in the US market in the past twenty years, yet the differences between the firms are immediately apparent at US seaports. Toyota uses port facilities to store vehicles, to conduct postproduction quality controls, and to postpone customizing vehicles and adding accessories. They may also combine loads of imports with models assembled in North America before redistributing these to dealers for final sale. In contrast, for Honda, seaports are simply transfer points to be passed through as quickly as possible. The different models of seaport usage imply very different relationships between the firms and actors in these localities and point to the wider differences in the overall logistics system of each.

The argument in this paper begins with the widely accepted proposition that firms operating at a global level face heightened risks and uncertainties because of the temporal and spatial remove between sites of production and sale (see Harvey, 1982). A focus on risk and uncertainty frames the flexibility problem as one that is essentially informational. In order to address these risks and uncertainties, actors within the firm are constantly engaged in a historically contingent, experimental, and contested process of designing organizational structures to achieve the desired goal of flexibility. In ideal-type terms, firm organizational structures vary in the degree to which they emphasize localization (the intraregional creation and collection of information) or globalization (the interregional transmission of information). The particular organizational structure created results in

internal constituencies and external commitments (compare Selznick, 1948) that exert influence in future rounds of strategic decisionmaking, hence shaping future firm organization in an ongoing, path-dependent fashion. This is particularly true for firms operating at a global (as opposed to an intranational or international) scale, as “globalization involves a criss-cross flow of exchanges within the context of a polycentric system, in which each center is considered in terms of its own specific resources” (Belis-Bergouignan et al, 2000, page 42). In this way, internal organization of logistics operations continues to influence the future development trajectory of the firm and so contributes to the observed pattern of persistent variation.

Uncertainty, flexibility, and the organization of automobile distribution

Schoenberger (1997, page 115) has convincingly argued that a relatively clear set of imperatives emerged for firms in the 1970s and 1980s; these “centered on quality, flexibility, collaborative labor relations, responsiveness to the market, and speed of response.” This heightened requirement for ‘flexibility’ points to increasing uncertainty arising from a variety of sources, including technological changes and global competition. There are, however, many ways to unpack the concept of flexibility. For example, Belis-Bergouignan and Lung (1999) draw a distinction between operational, strategic, and structural flexibilities that refer, respectively, to the ability to change the rate of output, the mix of output, and the nature of the output (see also Florida and Kenney, 1990). Knight’s (1921) distinction between knowable risks and unknowable uncertainties is especially useful here. Risks are variations in the operating environment that are to some extent anticipated, thus allowing for advanced contingency planning, whereas the term ‘uncertainties’ refers to changes in the operating environment that cannot be anticipated, resulting from, amongst other factors, the strategic actions of others.

An example of a risk facing an automobile assembler is an error in a production run, addressed by contingency arrangements for correcting defects. Likewise, automobile importers require the ability to change shipment volumes on a regular basis because of seasonal changes in demand and the annual importing of new models during the North American fall and winter. For the same reasons, flexible storage capacity is something that automobile importers value. Even if corporate logistics planners do not know precisely when or by how much conditions will change, they can establish flexible systems to deal with risk.

In contrast, the type of flexibility required to address uncertainty goes further than simply the ability of firms to acquire existing information about products and processes and connects with the notion that certain changes in the operating environment require that the firm redefine, or create new information about, itself (Schoenberger, 1997). For example, since 1980, individuals within firms such as Toyota and Honda have had to accept fundamental changes in their product offerings and hence their global production and distribution model. These cultural challenges to be flexible included the establishment and operation of transplant assembly plants (see Abo, 1998; Kenney and Florida, 1995), the introduction of a wider range of larger vehicle models, and the reorganization of what were by 1980 well-established distribution channels (see Mair, 1994).

Different organizational structures have different properties with respect to being flexible in the face of risk and uncertainty. One simplifying dualism in organizational structure helps to explore this issue, namely, the degree of ‘localization’ and ‘globalization’ in the logistics operation of the firm. This idea is somewhat analogous to, and builds upon the distinction between, horizontal (or spatially concentrated) and vertical (or spatially dispersed) transnational strategies developed by Gilpin (1987). The concept of globalization refers to the strength of the relationships between portions of the

firm in different locations around the globe. The concept of localization refers the strength of the relationships between different portions of the organization and actors outside the firm at the same geographic scale. A globalized distribution strategy emphasizes the direct interregional transmission of information between sites of assembly and sale and thus the overall firm decisionmaking coherence whereas a localized distribution strategy emphasizes intermediate points that allow the creation and application of decentralized knowledge in decisionmaking processes.

What distinguishes the internationalized and increasingly globalized firms from those of an earlier era is the requirement that they coordinate and use information from multiple sources, dispersed across space, at some speed. The creation, collection, coordination and use of information is, in essence, a learning process. In a review of the literature on organizational learning, Lawson and Lorenz (1999) argue that three ideas are central. First, learning depends on the existence of a shared system of knowledge; this is a precondition for the coordination and communication required for joint problem solving. Information as data is by itself not enough; it has to be transformed to become useable knowledge (compare Camagni, 1991). Note that the concept of information being used here includes both the tacit and codified or explicit dimensions and rejects the bipolar dichotomization of these concepts. Indeed, codified or explicit knowledge requires tacit knowledge in order to be interpreted and acted upon (Howells, 2002, page 873). Second, learning depends on the combination of diverse information. These two requirements establish the tension between localization and globalization within the global firm.

The source of this tension resides in the third idea from the literature on organizational learning identified by Lawson and Lorenz (1999). This is the notion that an organization is likely to experience resistance to the use of new ideas. This is because routines and procedures within an organization secure the position of particular individuals or groups in the organization. The ability to change these routines and procedures thus acquires a political dimension. Strengthening one element of the organization is not a neutral act; reorganization reconstitutes power relations, which in turn condition future decisions. These power relations are particularly important when considering the ability of the firm to address uncertainty as opposed to risk.

Although ideally the firm should be strong both in the sharing–communication and in the diversity–collection dimensions there is a fundamental tension between these two. A strongly globalized firm can collect information in one place and use it in another place (compare Lazonick, 1988, cited in de Banville and Chanaron, 1999; also Kogut and Zander, 1993). So, for example, on the basis of shared means of communicating, changing market demand in the United States can be translated into changing production schedules in Japan. However, the ability of the organization to collect a diversity of information depends in part on the strength of localization (see Abernathy, 1978; also see Kogut and Zander, 1992; Storper, 1997). For example, information about changing market demand in the different regional markets of United States can only be created and collected close to those markets and with the cooperation of dealers and other actors outside the firm. Strongly localized structures are able to anticipate and thus deal with risks of regional, seasonal, and cyclical demand shifts, but they create internal constituencies and external commitments that may compromise the ability of the firm to respond to structural changes in production organization, technology, and market preferences. In other words, a central tension for the global firm is the ability to learn both across regions and within them.

The notion that firms face a trade-off between intraregional and interregional organization is already explicit in recent theorizing about the future of the production side of the automobile industry. For example, Freyssenet and Lung (2000) construct

three possible scenarios for the process of internationalization in the automobile industry (see also Belis-Bergouignan et al, 2000). First, firms may follow a *global homogenization* strategy implying relatively strong interregional connections within the firm and the creation of 'global car' models. Localization would be relatively unimportant as learning would be less place specific. The second scenario is a polar opposite; *regional heterogenization* would imply the dominance of regional integration (that is, European, American, and Asian integration). Within regions there would be specialization and concentration, and there would be significant differences between regions in terms of product ranges, employment practices, and so on. The third, intermediate, scenario is described as *regional diversification or global commonalization*. This implies some shared fundamental traits (that is, of principal components and platforms) but differentiation in secondary factors (that is, in accessories and customization) to allow different market offerings and workplace arrangements. This suggests an attempt to balance localization and globalization, a scenario that most closely approximates Mair's (1997) characterization of *strategic localization*. Note that this typology is consistent with three possible combinations of strength in localization and/or globalization; the fourth possibility, that of weakness in both dimensions, does not warrant mention. Freyssenet and Lung (2000) argue that different firms will deploy different strategies and hence the eventual outcome is uncertain, contingent, and variable.

These predictions of persistent variation in production strategy are extended to the arena of distribution by the case studies of logistics operations to be presented here. Toyota has an organizational structure that emphasizes localization in distribution within the United States. However, although this overcame the risks of the pretransplant phase, the structure is somewhat at odds with the requirements of shifting to a lower level, but more diversified, set of imports and increased North American production. This is in contrast to other firms that have entrenched a more strongly globalized stance with respect to distribution, especially Honda, discussed here after Toyota. The empirical section of the paper concludes with some brief discussion of two German automobile manufacturers, Mercedes and Volkswagen, that provide further points of comparison.

Toyota: localization in distribution

Toyota Motor Sales USA (TMS) entered the US market in 1957, initially concentrating on the southern California market and selling low-cost passenger cars (Toyota, 1988). Toyota did not begin diversifying its domestic (that is, Japanese) product range until well into the 1960s, and it was increasing exports that provided the economies of scale that allowed the initial product diversification (see Belis-Bergouignan and Lung, 1999; Shimizu, 1998). The period since 1980 has been one of considerable change for Toyota in the United States, the most important factor being the rise of transplant production. As with other Japanese firms, transplant production began with popular, large-volume passenger car models (see Rubenstein, 1992). For example, the top-selling Corolla has, since 1984, been assembled at the New United Motor Manufacturing Inc. (NUMMI) plant in Fremont, CA. Toyota's annual North American production exceeded 900 000 vehicles in 1999 (see table 1, over).

The logistics implications of this shift have been profound. Annual sales of imported vehicles have halved since the high point of just over 1 000 000 vehicles in 1986. However, at the same time, the mix of imports has changed. Small-volume, higher value, physically bigger, and newer models are more likely to be imports. For example, all the vehicles in Toyota's luxury range, Lexus, are assembled in Japan. The Lexus range was first marketed in the United States in 1987 and, in 1999, over 185 000 vehicles were sold

Table 1. Sales of transplant production and imports by Toyota, Honda, Volkswagen, and Mercedes (source: WAD, Wards AutoInfoBank, <http://wardsauto.com>).

Year	Toyota ^a			Honda ^a			Volkswagen ^a			Mercedes ^a		
	North American production	imports	total	North American production	imports	total	North American production	imports	total	North American production	imports	total
1985	0	950	950	146	406	552	78	215	293	0	87	87
1986	7	1017	1024	235	458	694	74	203	277	0	99	99
1987	45	888	932	317	422	738	61	172	233	0	90	90
1988	72	864	936	376	393	769	38	154	192	0	84	84
1989	212	733	946	389	394	783	23	130	153	0	76	76
1990	349	710	1058	464	391	855	17	138	156	0	78	78
1991	335	677	1012	482	326	808	14	95	109	0	59	59
1992	406	617	1024	476	293	769	9	81	91	0	63	63
1993	480	553	1033	418	299	717	7	55	62	0	62	62
1994	514	574	1088	490	298	788	72	38	110	0	73	73
1995	611	472	1083	539	256	795	94	39	133	0	77	77
1996	698	462	1160	694	150	844	110	53	163	0	91	91
1997	755	475	1230	688	252	940	121	51	172	15	108	122
1998	858	504	1361	765	245	1010	179	89	267	44	127	171
1999	934	541	1475	803	274	1077	225	156	382	46	144	190

Note: figures are rounded to the nearest thousand; totals are calculated from the raw data and then rounded up and so may not represent a 'perfect' total of the first two columns.

^a Sales in thousands.

in the United States (Toyota, 2000a), representing almost 13% of all Toyota sales in that year and almost 35% of imports. This initially uncertain but very successful experiment in market segmentation has been copied by the other large Japanese producers (Nissan and its Infiniti range, Honda and its Acura range). The result is that logistics operations continue to be central to the ability of this firm to meet demand in the most variable and valuable market segments.

In a shift that reflects innovation in the automobile market, imported vehicles have also become bigger. In the period 1985–99, the US passenger car market contracted by 21%, whereas the market for ‘light trucks’ grew by 84%. The market for ‘light trucks’ is now as large as that for passenger cars. What this change reflects is not simply quantitative growth but rather qualitative change resulting from the introduction, first of minivans and, more recently, the intense competition for the lucrative sport utility vehicle (SUV) market. As a result, the proportion of Toyota imports that are light trucks rose from 39% of imports in 1985 to 53% in 1999. However, larger imported vehicles require ships with higher, or even moveable, decks (see Hall, 2002). As a result, Toyota’s own shipping subsidiary, Toyofuji Line, and its major carriers, NYK and K-Line, have had to replace their fleets of pure car carriers (vessels with low, fixed, ceilings), with pure car and truck carriers (vessels with flexible decks capable of accommodating vehicles of various heights).

Despite the product diversification and its attendant implications for logistic operations, the overwhelming story for Toyota in North America since 1984 has been one of dramatically expanded transplant production and reduced imports. This fundamental shift created pressures to restructure the distribution system. In the pretransplant phase, Toyota imported vehicles from Japan through nine US seaports and distributed these vehicles to dealers via twelve regional distributorships (see figure 1, and table 2 (over); note that the Chicago railhead was regarded as a port of entry). Each of the non-west coast ports of entry corresponded to one (or more) major regional distributorships. Apart from company distributorships in Los Angeles and New York, the other ten regional distribution operations began life as independent firms. Since the mid-1970s, all but two of these privately owned regional distributorships have been sold back to TMS.

The independent distributorships were established during the mid-1960s at the time when Toyota was expanding beyond California. The degree of autonomy enjoyed by the independent distributorships was periodically adjusted in order to ensure that



Figure 1. Toyota: the nine ports of entry and twelve regional distributorships, circa 1975 (mapping software: USACE, 1999, NDC Publications and US Waterway CD, Volume 5, US Army Corp of Engineers). Note: company distributorships at Los Angeles and New York, and private distributorships at Chicago, Kansas City, Cincinnati, Jacksonville, Houston, Baltimore, Boston, Portland, and Denver are shown but are not labeled. The Alaska private distributorship is not shown.

Table 2. Toyota Motor Sales: import port usage and regional distributors (source: Toyota, 1988; corporate interviews).

	Pretransplant period (circa 1975)	Current (2000)
Import seaports	Portland, Benicia, Long Beach, Houston, Jacksonville, New Jersey, Baltimore, Boston, Chicago railhead	Portland, Long Beach, New Jersey, Jacksonville, Baltimore
Distributorships company	Los Angeles (formed 1957), New York (formed circa 1966)	San Francisco, Los Angeles, New York, Portland, Denver, Kansas City, Alaska, Chicago, Cincinnati, Boston, Central Atlantic Toyota (Baltimore)
independent or private	Mid-Southern Toyota (Chicago, formed 1966; split into Chicago, Kansas City, and Cincinnati in 1973), South-East Toyota (Jacksonville, formed 1969), Gulf States Toyota (Houston, formed 1969), Mid-Atlantic Toyota (Baltimore, formed 1971), New England Toyota (Boston, formed 1971), Portland, Alaska, Denver	South-East Toyota (Jacksonville), Gulf States Toyota (Houston)

“the system did not degenerate into simply being a loose group of sales companies” (Toyota, 1988; page 215). For example, the first independent distributorship to be formed, in 1966, was the Chicago-based Mid-Southern Toyota. In 1973, and at the instigation of TMS, the distribution company was split into three separate companies, each responsible for a smaller number of states. Finally, in 1976 the three companies were bought by TMS and transformed into the Chicago, Cincinnati, and Kansas City sales regions.

Apart from buying cars from Toyota at a discount and then being responsible for warranty and goodwill costs, the private distributorships fulfilled three important, but potentially separable, functions. First, they serviced a dealer network, thus maintaining contact with the point where sales actually took place. This is a crucial information-gathering function as dealers were consulted closely when regional sales staff prepared production orders (and still are). These production orders ultimately inform aggregate production levels as well as the planning of product and model mixes, colors, and various optional accessories. Second, they were responsible for the distribution of parts to consumers. And, third, they were responsible for port reception, although all made use of an independent port-processing firm to handle customs paperwork and inspections. In short, they ran the region, and, as the port facility was the responsibility of the distributorship, it is not surprising that there was a close correspondence between the two. Conceptually, this distribution system may be thought of as being strongly localized, as there was virtually complete integration of distribution activities at the US regional market scale.

This localized distribution structure resulted in significant processing and accessorizing activity in the various ports used by Toyota. An executive almost twenty years in the company commented: “in the old days, Toyota allowed the distributors to do lots of accessorization, shipping very basic cars.” This accessorization included radios, air-conditioning, show wheels, and the addition of vinyl roofing, roof racks, and so on. The accessorization work was an important profitmaking opportunity for the distributorships,

made possible by the fact that they combined import operations, dealership management, and part-distribution functions for the consumers. At the margin, it could be argued that the distributorships actually encouraged customer choice, thus preparing the way for later model and range diversification (see Chanaron and Jullien, 1999).

In summary, the localized structure provided Toyota with the capacity to generate, collect, and act upon information about different (regional) market segments. For example, South-East Toyota could provide Floridians with air conditioning at a time when this was not standard in relatively low-cost vehicles. The distribution system thus provided a certain degree of flexibility in the face of normal market risk. However, with the expansion of transplant production Toyota has been rationalizing its distribution networks both for parts and for automobiles. This was not achieved in one step, nor without experimentation and internal corporate struggle.

Apart from Gulf States Toyota and South-East Toyota, all the private distributorships have been sold back to TMS. In the process, the three functions identified above were separated. Company sales regions (distributorships) continue to provide a dealer interface and to generate production orders. However, the company sales regions are no longer responsible for part distribution to consumers or for port operations. Such part distribution is now the responsibility of the North American Parts Logistics Division of TMS (Toyota, 2000b), which operates two parts centers in Ontario (CA) and Toledo (OH). These parts centers supply smaller parts-distribution centers in various locations, which in turn supply the dealers.

Toyota Logistics Services (TLS), a subsidiary of TMS, is responsible for production part logistics and vehicle distribution. TLS is thus responsible for what are now called vehicle delivery centers at the various seaports and the assembly plants (Thomas, 1998). TLS is also responsible for Toyota's in-house trucking company, and it coordinates the supply of production facilities in California, Kentucky, Indiana, West Virginia, and Ontario. Production activities have, however, remained under Toyota Motor Manufacturing North America Inc., unlike in Japan where the Toyota Motor Company and Toyota Motor Sales merged in 1982 (Belis-Bergouignan and Lung, 1999). The continued split between production and distribution within Toyota's US organization is an ongoing reflection of the firm's initial market penetration.

The centralization of seaport operations within TLS has been accompanied by some rationalization of port usage. During the 1990s, Toyota ceased using the ports of Boston and Benicia, and the Chicago facility simply became a railhead rather than a customs port of entry [see figure 2 (over) and table 2]. However, unlike Honda (see below), Toyota has not stopped using other east-coast ports. When asked why TMS had not closed all the east-coast port operations, one Toyota distribution manager at a west-coast facility ascribed it to 'politics'. When pressed, he explained that it was both politics with a capital P—apparently the firm did not want to be seen to be withdrawing business from too many localities—and that the decisions also reflected intrafirm politics and the resistance to changing established organizational structures.

This comment points to the deeper commitments of individuals within the firm to localities that include, and extend beyond, the formal contractual ties that Toyota maintains with various US port authorities. In New York, Long Beach, and Portland, TMS operates large port facilities on long-term lease and did so in Baltimore until 2002. The localized distribution system created a series of formal and informal commitments and obligations that have shaped subsequent firm reorganization. For example, Toyota has operated in the port of Long Beach since 1957, but since the 1970s has faced increasing competition from container steamship lines for scarce port land. In order to secure its facilities within the port of Long Beach, Toyota has maintained a set of



Figure 2. Toyota: five ports of entry and the thirteen regional distributorships in 2000 (mapping software: USACE, 1999, NDC Publications and US Waterways CD, Volume 5, US Army Corp of Engineers). Note: company distributorships at Los Angeles, New York, San Francisco, Portland, Denver, Kansas City, Chicago, Cincinnati, Boston, and Baltimore, and private distributorships at Jacksonville and Houston are shown but not labeled. The Alaska company distributorship is not shown.

interlocking relationships with port commissioners, local public officials, community and labor organizations, and the Union Pacific railroad (see Hall, 2002).

In addition to TMS operations at the three ports, the port of Jacksonville also receives imported vehicles for the private South-East Toyota distributorship. This is the largest franchised distributor of Toyotas in the world, distributing some 240 000 vehicles in 1999 to 160 dealers in Alabama, Florida, Georgia, and North and South Carolina (Thuermer, 2001). As with the other independent distributorships prior to 1990, South-East Toyota combines dealership, parts and port functions. The presence of South-East Toyota in the port of Jacksonville also provides TMS with a facility for the importation of Lexus vehicles (Toyota, 2000b). The other independent distributorship, Gulf States Toyota, stopped using the port of Houston in 1994; imports from Japan are received via the port of Long Beach and rail.

Dealers have also played a key role in decisionmaking processes about logistics operations. In interviews, some Toyota managers argued that dealers were an important constituency in favor of maintaining existing port processing and accessorizing facilities. Currently, a dealer in the interior of the United States may have to wait up to two weeks between when it places final orders for specific accessories and when the vehicle is delivered to the point of sale. Without the capacity to accessorize at the port facility, this order would have to be transmitted to the assembly plant in Japan. Sea travel time would then add another two weeks to the delay. This is precisely the kind of flexibility benefit that the localized distribution system was supposed to provide. Note, however, that this perspective makes sense only in the absence of accessorization by dealers.

The case of Toyota's operation in Baltimore provides an interesting example of the experimental way in which the logistics operation was reorganized. Mid-Atlantic Toyota (MAT) was established in Baltimore in 1970 as the independent distributor for the District of Columbia, Pennsylvania, West Virginia, Virginia, Delaware, and Maryland. MAT was the last private distributorship to be sold back to TMS, in 1990. MAT was then renamed a company sales region, Central Atlantic Toyota (CAT). However, CAT was allowed to operate on the same basis as the private distributorships, even though it was now fully within the Toyota group. In the words of a regional manager: "we were a sales region owned by Toyota but we had an independence about us in that we had a parts distribution center, and the port". This "was a conscious experiment to see whether we could get better results by having the three elements tied together with

intelligent administration of resources". The only differences between CAT and the fully independent Gulf States and South-East Toyota were that the independent firms carried the warranty risk and had some liberties to do additional or different accessorization, as they are allowed to go outside Toyota original equipment manufacturers (OEMs) for parts and other supplies.

As it happened, in early 2002, TMS announced that it would be closing its Baltimore port facility when its lease expired in 2003 (see Hall, 2003). The port of New York was selected to be the northeast hub for automobile imports. For the most part, therefore, the vertical integration of the regional distributorships has involved a weakening of localization in distribution. With an increasingly wide range of model offerings, the flexibilities offered by the localized model, particularly the large amount of accessorization, has become relatively less important. Likewise, as transplant production increased, Toyota in North America required a greater continentwide coherence, especially in relation to parts distribution. However, the logistics operation was not implemented overnight, and not without conscious experimentation.

The history of the import logistics system of Toyota's closest rival in Japan, Nissan, resembles the story of Toyota. Nissan also operates a localized distribution model. However, Nissan performed poorly in the North American market in the 1990s. In 1999 Nissan sold 678 000 vehicles, of which 272 000 were imports. This is close to half the import level of Toyota and represents a 60% decline from the 680 000 imports in 1985, in a context where overall sales have declined by 18%. However, Nissan automobiles are still imported through Los Angeles, Seattle, Jacksonville, Newport News, and New York—a pattern of regional representation that is essentially no different from that of Toyota. Port processing of vehicles is conducted by Distribution Auto Services (known as DAS), a wholly owned subsidiary of Nissan Motor USA. DAS has been actively seeking additional clients to sustain business volumes as Nissan's fortunes have waned.

Honda: more global than local

The Honda Corporation has been described as having a local–global character (Mair, 1994). In the production arena, this organizational model allows localized learning and responsiveness while maintaining global coherence. This suggests that Honda has been able to achieve a unique balance of localization and globalization. Although this may be true in the design and production arenas, the US distribution system of the firm has a decidedly global orientation. In this way it provides a useful point of comparison with Toyota.

Honda was the first Japanese firm to begin transplant production in North America—in 1982, at Marysville, OH then in Mexico in 1985, in Canada in 1986, and, finally, in East Liberty, OH, in 1989. Production in North America has become more extensive than that of Toyota—with an equivalent aggregate level of transplant production approaching 1 000 000 vehicles per year, 75% of Honda's US sales are produced in transplants, compared with 65% for Toyota (see table 1). Exports of US production have also reached higher levels than those of Toyota. Honda exported over 100 000 vehicles in 1994, and approximately 50 000 per year in the late 1990s. Toyota exported almost 70 000 vehicles in 1995, and only approximately 30 000 per year in the late 1990s. However, like Toyota, Honda tends to produce its large-volume passenger cars in transplants, and imports the larger and more valuable SUVs, minivans, and sports models.

Honda has established direct and close relationships with dealers without a regional tier in the distribution system. This reflects a global firm goal. Sean Willis of the Logistics Department at Honda Europe observed that, "our biggest aim is for cars to go straight to the customer and reduce inventory, as is the case for US production" (quoted in

Cullen, 2001). What this implies is a strongly globalized logistics model. Honda tends to ship automobiles ‘showroom ready’. It does not have an extensive network of preparation and accessorization centers, decentralizing these functions, such as they exist, to the dealerships.

In this context, it is not surprising that Honda has never operated seaport terminals directly; rather, it has short-term contracts with various independent port processors and terminal operators. Independent port processing firms complete postvoyage inspections and the paperwork required for customs clearance and then dispatch imported vehicles to dealers. The goal of Honda port operations is thus, in the words of one port facility manager, “to get the car out to the dealer as fast as possible.” This organizational structure both ‘freed’ corporate logistics planners aggressively to rationalize port usage as well as ‘encouraging’ them to do so.

In 1980 Honda used seven ports on the east and west coasts, but has since moved completely to a land-bridging distribution model (see figure 3 and table 3). The term ‘land-bridging’ has been coined in relation to the container shipping business to describe the use of ports on only one coast of the continent and then to move goods by rail or road across the continent. Honda’s land-bridging started in 1984 with the end of operations at the port of Houston. Two years later a full land-bridging model was implemented; Honda ceased operations at three east-coast ports (Jacksonville, Newark, and Portsmouth).



Figure 3. Honda: the seven ports of entry, circa 1980 (mapping software: USACE, 1999, NDC Publications and US Waterway CD, Volume 5, US Army Corp of Engineers).

Table 3. Honda: usage of ports for imports since 1980 (source: corporate interviews).

Ports, 1980 (processor)	Closures	Openings	Ports, 2000 (processor)
Houston (Port Services)	Houston, 1984	Los Angeles, 1989	Portland (Auto Warehousing)
Long Beach (Pasha)	Long Beach, 1989	San Diego, 1999	San Diego (Pasha)
Richmond, CA (Pasha)	Richmond, 1995–96		
Portsmouth, VA (Hobelman)	Portsmouth, 1986		
Newark (Shimazaki)	Newark, 1986		
Jacksonville (Hobelman)	Jacksonville, 1986		
Portland (Auto Warehousing)	Los Angeles, 1999		

Today Honda, which imports the same number of vehicles as Nissan, uses just two west-coast ports for all imports (San Diego and Portland; see figure 4 and table 3). Land-bridging also implies greater reliance on rail transportation, and in the 1990s Honda invested considerable time and resources in a joint venture to develop a flexible passenger car or SUV-carrying railcar known as the 'Automax'. Further rationalization of port usage is, however, unlikely; in the words of one Honda manager, "we wouldn't want to have all our eggs in one basket." Honda executives are also apparently considering reopening an east-coast import operation following the west-coast port lockout of October 2002. It should also be noted that Honda does use several other ports for exports, including Los Angeles, Jacksonville, Newark, and Port Everglades.

By not operating port facilities directly, individuals within Honda did not share the local commitments noted in the case of Toyota. There was hence no regional distributorship structure lobbying to keep port facilities open, and so corporate logistics planners in the firm were thus 'freed' to rationalize port operations more aggressively. However, Honda's changing port usage was not the result of internal decisionmaking alone. In 1990 Pasha, the independent port processor handling Honda imports in the port of Long Beach at the time, was displaced from that port when its terminal lease expired. The terminal Pasha had been using was consolidated with the adjacent Toyota facility to create a larger facility that Toyota continues to lease and use today (see Hall, 2002). These events contributed directly to Honda's relocation of import operations to the new Pasha operation at the port of San Diego.

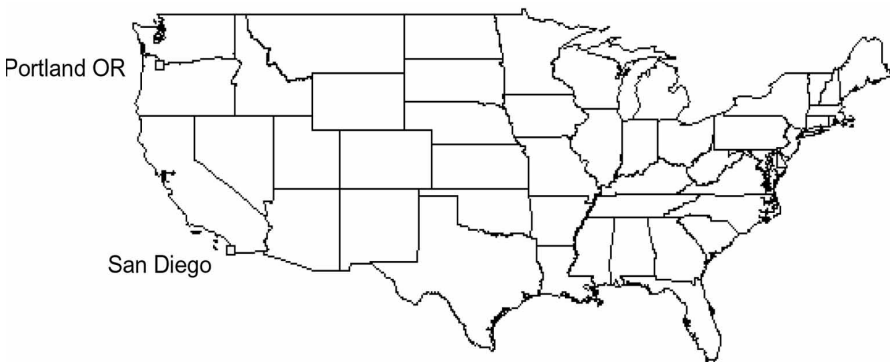


Figure 4. Honda: the two ports of entry in 2000 (mapping software: USACE, 1999, NDC Publications and US Waterways CD, Volume 5, US Army Corp of Engineers).

There are other lessons to be learned from the comparison of the distribution models used by Toyota and Honda in the United States. The firms share several circumstances; both are Japanese importers that increasingly have switched to transplant production of their most popular models. Both must be regarded as successful in their own terms as both have secured an increasing share of the US market. Together, the cases demonstrate that flexibility may be achieved from either localization in distribution, as in the case of Toyota, or globalization in distribution, as in the case of Honda. However, as these strategic differences have become inscribed in the structure of the organization, in the practices and routines, and in its external commitments, they have exerted differential influence in the subsequent restructuring of firm logistics operations. At the same time, even though individuals within the firm do develop commitments to particular structures, both cases show us that business models remain 'works in progress', objects of continuous conscious experimentation.

Despite the qualitative difference in the business models employed by Toyota and Honda, it might be possible to argue that the differences relate to their respective sizes and model offerings. To some extent this is true; the larger the firm the more likely it is to have regional distributorships. However, even this source of structural differentiation in logistics operations need not necessarily apply in the same way in all instances. In the remainder of the paper I address this issue through a brief discussion of the distribution systems used by two German automobile manufacturers. Both firms have substantially less US market presence than does Honda, but have in the case of Mercedes maintained and in the case of Volkswagen extended processing operations at or near ports of entry to meet particular strategic goals. In other words, the particular combination of localization and globalization attributes in the distribution system is not explained by size alone. This reinforces the notion that there is a considerable margin of variation in the possible logistics operations of otherwise comparable firms.

Mercedes: distributing the global car

Mercedes-Benz, the luxury car manufacturer and subsidiary of Daimler-Chrysler, is represented in the United States by MB-USA, the import, sales, and distribution arm, and by MB-USI, the production arm for the assembly plant in Alabama. MB-USA is responsible for a series of vehicle processing centers (VPCs) and parts distribution centers (PDCs). Dealers are independent, with the exception of the Manhattan dealership. The Mercedes distribution model might thus be characterized as globalized as there is no localized tier equivalent to the Toyota regional distributorships. However, dealers are organized into sales zones that are matched to particular VPCs and PDCs and, in the recent past, the regional distribution–sales linkage within MB-USA was much stronger. Although this localized structure has been weakened, key elements were retained through a restructuring process that was both incremental and experimental.

Before 1990, VPCs, PDCs, and sales zones were congruent, as in the Toyota distribution model. There were seven such regional entities, headquartered in Chicago, Houston, San Francisco, Newark, Baltimore, Los Angeles, and Jacksonville. In 1983, the Newark and Baltimore operations were consolidated into a larger facility at Belcamp, about 30 miles north of Baltimore. Apparently, this move was motivated primarily by the desire to separate processing operations from the waterfront, especially from the longshoremen's jurisdiction in Newark. A site near the port of Baltimore was chosen because Baltimore was also the port of entry for the Chicago sales zone. However, it was another seven years before the entire distribution system was reorganized.

In 1990 the sales and distribution activities of MB-USA were formally split, and relationships with the dealers were reorganized towards an explicitly pull-oriented distribution model. This application of 'lean distribution' principles, which allowed dealer inventories to be reduced, required a wider organizational restructuring. The VPCs no longer reported to the manager of the sales region but to the head office of MB-USA in New Jersey. It is in this context that a number of VPCs were closed, and hence the number of ports used was reduced; Houston closed in 1990, Chicago in 1993, and San Francisco in 1997. The ports of Jacksonville, Baltimore, and Los Angeles continue to be used, with a corresponding VPC physically located a short distance inland from the seaport.

In separating the VPCs from sales, Mercedes has been able to achieve a single continental (that is, globalized) distribution system. The reorganization is best understood within the context of the specific trajectory of the firm. First, imports of commercial vehicles, which had previously been processed at the Newark, Houston, and Los Angeles sites, declined in the 1980s after Mercedes (Daimler) bought Freightliner and shifted its production for the North American market to this 'transplant'. In particular,

this probably contributed to the decision to close the Newark facility. Second, although production began only in 1997 at the Mercedes plant in Alabama, this move followed the reorientation of the wider global strategy of the firm. Mercedes is pursuing what might be described as a global homogenization strategy (Freysenet and Lung, 2000) in which the product is the same across the world. In this context, the Alabama assembly plant produces the M-class SUV, and it is the only Mercedes plant in the world to do so (Martin, 1997). This 'global car' production strategy demands a more globally integrated distribution system.

And yet, despite considerable rationalization, the VPCs and PDCs have remained, and, unlike Honda, Mercedes has not abandoned all the elements of localized distribution. The rationalization of PDCs has not proceeded as far as that with VPCs; they are located in Baltimore, Jacksonville, Fort Worth, Los Angeles, Chicago, and, until recently, in Somerset, NJ. Because most parts distribution is ultimately through the dealers, the PDCs are more closely matched to sales regions. VPCs still exist, in part, because a pure pull system (that is, production occurs after sale), even for a luxury automobile firm such as Mercedes, is not (yet?) achievable. The VPCs are still required to provide a measure of flexibility to meet changes in market demand. In addition to the postshipment inspection and fitting of standard accessories appropriate to the US market (for example, service books), VPCs are used for fitting optional extras. These change constantly as new standards are set. For example, at the time of writing, car phones were an optional extra fitted at the VPCs.

Volkswagen: hybrid strategy for quality

A final point of comparison is provided by the case of the German automobile assembler, Volkswagen. Volkswagen was one of the first foreign automobile manufacturers with a substantial presence in the US market. Until the 1990s Volkswagen employed a distribution model very similar to that of Toyota, owning its own ships and operating its own localized port-linked distribution operations. The fortunes of the company in the US market turned sharply for the worse in the late 1980s and early 1990s, with sales falling from almost 300 000 in 1985 to approximately 60 000 in 1994 (see table 1). The firm responded with a rationalization process that included closing the port facilities at New York and Los Angeles.

However, today, Volkswagen still has a presence in the ports of San Diego, Houston, Wilmington, DE, Boston, and Brunswick, GA, and combines globalization and localization elements in its distribution system. This is explained by the particular combination of strategies adopted in response to this firm's 'crisis' in the US market. Perceptions about quality got most of the blame for Volkswagen's poor showing. Doubts about quality were exacerbated when production was halted at Westmoreland, PA, in 1988, and the old kit assembly plant in Puebla, Mexico, was expanded. Today, Volkswagen Beetles and most Golfs sold in North America are produced in Mexico, and the established network of port processing facilities now plays an important role in the distribution of these vehicles.

In 1992, port processing centers that had previously been operated to receive and distribute vehicles from Europe became points for a postproduction check (PPC) designed to improve the quality of Volkswagen's delivered for sale (PWD, 2001). Specialized PPC facilities were built at all ports, to be operated by independent processing firms under the close supervision of Volkswagen employees. Apart from their publicity value, the PPCs provided a valuable source of information to process-control engineers at assembly plants in Mexico and Germany. In the words of one VW port operations manager; "this is checkpoint 9—1 to 8 are at the factory."

The global dimensions of this restructuring in the distribution system should not be underestimated. Apparently, the corporate head office in Wolfsburg, Germany, maintains strict control over standards and procedures at the various PPCs. The firm has also moved to limit its contractual commitments to the independent port processors to no more than three years at a time. However, the PPCs do fulfil many of the roles of the regional distributorships identified in the Toyota logistics operation. For example, port facilities continue to play a role in inventory storage. The commitments of Volkswagen staff at PPCs also appear to be mixed: in some instances they are engineers on short-term assignment from Germany and elsewhere; in others they are residents of the locality. One such local resident reported in an interview his frustration with the personal uncertainties generated by the regular three-year contract review.

The Mercedes and Volkswagen cases illustrate three points. First, they confirm that size alone does not account for the firm-specific way in which elements of localization and globalization are combined in the organization of logistics operations. Second, they illustrate that this combination of globalization and localization elements causes tensions within the firm and in its dealings with third parties. Third, they show that shifting from a strategy of localization towards a strategy of globalization (or vice versa) is not to be achieved in a single neat and complete step.

Conclusions

In this paper I have sought to establish a theoretical case for persistent variation in the logistics operations of firms operating at a global scale and have demonstrated this empirically through case studies of the logistics operations of several importers of new automobiles to the United States since 1980. Although each of the firms considered here experienced the same market conditions and the same changing levels and mix of imports associated with the rise of transplant production in North America, each reorganized its import and distribution operations in ways that maintained variation. Several factors account for this variation, including national home base, production strategy and technology, model offerings, and other firm-specific details.

What has been shown is that in addition to the recognized production-side factors the organization of intraregional and interregional information flows that sustain goods movements itself constitutes a basis for persistent variation. In the face of uncertainty, firms seek to establish organizational structures designed to provide flexibility both through the intraregional creation and collection of information and through its interregional transmission. However, these informational goals imply very different organizational structures that are in tension. Localized distribution structures that emphasize the creation and collection of information intraregionally establish very different internal constituencies and external commitments from the globalized distribution structures that emphasize the interregional transmission of information. Persistent variation is the most likely outcome of this tension as firms constantly seek to reorganize their logistics operations in historically contingent, experimental, and contested ways.

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