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Manufacturing Renaissance: Return of manufacturing to western countries

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Abstract

This paper argues that the location of manufacturing is gradually shifting to the west again, i.e. Manufacturing Renaissance. Such claim is based on the recent observed trend and the discussion is contextualized within the established theory that has been able to explain the location of manufacturing, i.e. Product Life Cycle Model (PLC). Then the paper identifies and discusses the four main drivers of this new phenomenon. Finally, it is noted that the return of manufacturing should be kept in portion and not all industries are coming back to the west in the same pace.

Key words: re-shoring, locational shift, manufacturing, Product Life Cycle model

JEL classification: O14, E02, E22, F21,

1. Introduction

Twenty-one percent of North American manufacturers reported bringing production back into or closer to North America in the past three months (surveyed by manufacturing sourcing Web site MFG.com in June 2011). More than a third of U.S.-based manufacturing executives at companies with sales greater than $1 billion are planning to bring back production to the United States from China or are considering it (BCG, 2012). For example, General Electric (GE) recently announced a $1 billion investment to "re-shore" the manufacturing of its appliances from Chinese's plants back into a plant in Kentucky, United States (Crooks, 2012; The Economist, 2013)[2]. This is obviously a new trend (The Atlantic, 2012), while in late 60s and early 70s up to recent years the trend was the other way around, i.e. western manufacturing has vastly moved to less developed countries (LDCs). As Norton and Rees (1979, p.147) argued, the main reasons were "the low labor cost and favorable business climates of such LDC's as South Korea and Taiwan". Vernon (1979, p.266) noted similar statement: "Although income, market size, and factor cost patterns have converged among the more industrialized countries, a wide gap still separates such countries from many developing [LDCs] areas". However, things have changed recently and those two reasons seems not to be in place anymore (at least not to the extent that were the case in late 60s and early 70s). Concerning labor cost, in a recent report Boston Consultancy Group anticipates that the net manufacturing cost in China and US will converge in already 2015 (Sirkin et al, 2011)[3]. Concerning business milieu, there has been recent and recurrent complains about IPR problems in China and other Asian emerging economies. Indeed a new trend has been observed which indicates the 'return' of manufacturing to western countries, especially to US (Sirkin et al, 2011; The Economist, 2012; The Atlantic, 2012).

[2] For further evidences of recent reshoring, see Appendix 1.

[3] One should be cautious when it comes to citing the consultancy reports. Nevertheless, the consultancy reports are currently more or less the only available figures in the topic of manufacturing renaissance.

The aim of this paper is to shed some lights on the new pattern on locational shift of western manufacturing, i.e. so-called in this paper 'manufacturing renaissance'. This will be performed by developing arguments within the context of PLC model, while borrowing arguments from transaction cost theory and new economic geography.

The rest of the paper is organized as follows. Section 2 presents the established PLC model briefly. Section 3 demonstrates the newly observed trend in location of manufacturing. This is done by adding the additional phase to the established PLC model. Section 4 discusses the factors driving such new pattern. Section 5 summarizes and concludes.

2. Product Life Cycle model (PLC)

The product life cycle approach to international trade and investment provides a systematic explanation of how the location of manufacturing, exporting, and importing of a product changes over time. Such locational shift has been studies initially in international level (Vernon, 1966, 1979; Hirsch, 1967; Wells, 1969). This was followed by studies of PLC model in interregional level (Rees, 1979; Norton and Rees, 1979). Vernon (1966)'s original model is presented in Figure 1.

[Figure 1 about here]

The model proposes that location of the production (and subsequently the export and import patterns) is varying based on the maturity level of the product. More specifically, Vernon (1966) argued that the production of a product in its first phase of development (i.e. new product phase) would be located in US. First, this is because there is more demand for a new product in US market, among other things, because of high average income in US in compare with other countries (Vernon, 1979). Second, because there are more supplies of high skilled labor Hirsch (1967) as well as externalities (i.e. in terms of swift and effective communication between the producer, customers, suppliers, and even competitors) available in US (Vernon,

1966). The two supply factors are essential for overcoming the uncertainty in product specification and market, which are inherently existed during the early phase of product development (Utterback & Abernathy, 1975). This early phase of product development is accompanied with higher US export.

The production of the second phase of product development (i.e. maturing product) would be located in other advanced countries. Vernon (1966) argue that as the demand for a product expands, a certain degree of standardization usually takes place, however, there are still efforts for product differentiations. Since there are some degrees of standardization, there would be relatively less need for externalities. Instead, there would be more orientation toward economies of scale and more concerns about production cost (rather than product characteristics). This is why the manufacturing location of a product would presumably move to other developed countries. Hence, the US-made production would stagnate and the import from other developed country would start. However, US export would still be dominant on US import.

Finally, the production of third phase of product development (i.e. standardized product) would probably move to less developed countries (LDCs), since they can provide competitive advantageous for production location in this phase. Vernon (1996) provides several reasons for such claim. First, the standardized products tend to have lower uncertainty in terms of their specification (unlike new products). Hence the need for skilled labor and externalities (such as local knowledge) is remarkably reduced, which reduce the dependency of their location on US or other advanced countries. Second, standardized products tend to have lower uncertainty in terms of market, i.e. they have a well-articulated and easily accessible international market, so the marketing cost (from distance) is low. Third, these products are assumed to have high price elasticity of demand (unlike new products) and they are assumed to be mostly sold based on price. This would act as a motivation to take the risk of moving the production to a new location. Fourth, these products need

significant labor inputs for their production, which is (again) an incentive for moving the production to low-cost labor countries, i.e. LDCs. As a consequence, it may be wise for the international firm to shift the location of their standardized products into the LDCs, conditional on the fact that labor costs differences are large enough to offset transportation costs. This would be accompanied with higher import and lower export for US.

3. Manufacturing renaissance: A new pattern

This part adds an additional phase to the established model of PLC developed by Vernon (1966, 1979) and Hirsch (1967). This is not the first time a study tries to modify the original PLC model based on the observed trend (see Vernon, 1979; Giddy, 1978). The main motives for introducing the 4th phase here is the recent changes in LDCs (emerging economies). Moreover, the impact of such changes on the behavior of US and other advanced economies are difficult to distinguish, since they have become homogeneous in terms of various externalities over time (Vernon R. , 1979). The new pattern of production location, import and export for three classic categories of countries is depicted in Figure 2.

[Figure 2 about here]

Assuming the PLC model can be at work, the first three phases of Figure 2 is identical to the original PLC model (Figure 1), while the 4th phase is an add-on. The main argument for adding the 4th phase is that some part of manufacturing production is coming back to western world, especially to US. Considering the assertion that "a firm cannot pursue reshoring unless it had previously pursued offshoring" (Gray et al, 2013), reshoring should *bring back* jobs to western countries. The reason for proposing such new pattern is based on newly observed pattern,

briefly reviewed in introduction section. Such new pattern can be explained by several driving factors, which are discussed in section 4.

4. Factors explaining the 'manufacturing renaissance'

There might be several factors driving the new pattern in location of manufacturing, i.e. manufacturing renaissance. These factors are: raising wage-levels in emerging economies, lower quality of business milieu in emerging economies (LDCs), new sources for economies of scale back in western countries, and motives for meeting the demand of local customers in western countries. The first three factors are supply-side factors and the last factor is a demand-side one. The discussion of each factor is presented in the following subsections.

4.1. Rising wage-levels in emerging economies

Wage-level has been always an important motive for offshoring the manufacturing to LDCs (Norton and Rees, 1979; Vernon, 1979), especially if economies of scale are already being fully exploited (Vernon, 1966). Recent evidences also suggest that the wage differential is still one of the most important drivers of offshoring to LDCs. In examining the motives for offshoring, a recent survey finds that more than 50 percent of firms in Denmark, Sweden and the Netherlands state that labor cost savings is the primary reason for offshoring their business functions abroad (Statistic Denmark, 2008). Moving to LDCs has been principally faster for labor intensive industries, because they are most affected by increases in industrialized countries' wages relative to the rest of the manufacturing sectors (Puga and Venables, 1996)[4]. In addition, weakly linked industries are also the ones who moved faster to LDCs, because they benefit less from being close to other industries in western world (they neither sell a large fraction of their output to other industries nor spend a large share of their costs on intermediates produced by them). They are therefore the first to re-

[4] It should be note that the location of production goes to LDCs, if labor cost differences are large enough to offset transport (Vernon , 1966).

shore in response to *labor cost differentials*, being gradually followed by more capital-intensive and strongly linked industries (Puga and Venables, 1996).

However, new reports points that the labor differential is not in place to that extent that enabled the companies to move to LDCs since 70s up to now. For instance, Boston Consultancy Group argues that wage-level in China is increasing by average 20 percentages annually and productivity improvement is not enough to offset the labor cost. On the other hand, it is known that the average US-wage level has been stagnated for the past couple of years. Even some new reports show the decline in U.S wages in manufacturing by 2.2% after 2005 (The Economist, 2013). Such decline in U.S wages is mostly in southern States and it is mainly due to financial crisis, which increased the unemployment rate, and eventually increased the willingness of labor force for working with lower payment. Hence, it is indeed anticipated that the net manufacturing cost in US and China will converge in 2015 for many industries including computer & electronics, appliance, furniture, and machinery (Sirkin et al, 2011). Such new situation definitely violates the traditional main driver of moving the manufacturing to LDCs, i.e. wage-level differentials. Recent evidence indeed suggests that heightened wages in some LDCs has reduced the US offshoring to those countries (Swenson, 2005). However, it should be note that the rising wage-level in China may lead to lower offshoring of western manufacturing to China, but this may not necessary imply the increase in manufacturing in west. Instead, higher wage in China may lead to offshoring of western manufacturing to *other* less developed countries, like Cambodia or Mexico. This could be especially the case for capital intensive and low-skilled products that have longer life cycles.

One can ask a question that 'why' the wage-level in emerging economies (especially China) is actually increasing dramatically in recent years. There can be at least two reasons for this. First, as Puga and Venables (1996) argued, offshoring of manufacturing to a country will eventually lead to growth of that industry in that country. This implies the growth for demand in manufacturing within that country.

Finally, this leads to bidding up wages in that industry and country and there will be eventually a critical mass. In this point, it is not profitable anymore to stay in the previous country, hence the manufacturing will move to another country. This is actually what happened in LDCs, particularly in China. Second, there has been a new trend of "brain circulation", i.e. returning the highly educated Chinese (and some other LDCs) from US back to their home country (Saxenian, 2006). These people usually have higher salary than ordinary employees in LDCs. Therefore, by returning to china, they have raised the average wages.

Furthermore, even if (part of) manufacturing returns to the west, this may not be an equilibrium state in the long-run and the manufacturing can come back again to emerging economies in the future. This can be explained by two reasons. First, as Puga and Venables (1996) argued: the return of manufacturing to west will eventually lead to further growth of that industry in the western countries, implying further growth for demand in manufacturing in those western countries. Finally, this leads to further bidding up wages in that industry and country and there will be eventually another critical mass. Second, and from demand perspective, if emerging economies grow fast enough and thus demand increases in these locations, then there will be again incentive to move back the manufacturing to emerging economies in order to be in the center of demand (Gray et al, 2013).

4.2. Lower quality of 'business milieu' in emerging economies

It is shown that entry to new market inherently involves transaction cost and such transaction cost is reduced via proper institutional setting of the host country (Meyer, 2001). Proper institutional setting (business milieu) was indeed one of the reason that manufacturing has vastly moved to less developed countries (LDCs) in late 60s and early 70s (Norton and Rees, 1979; Vernon, 1979). Recent studies also emphasize on the importance of government trade policies (a form of business milieu) as an

important factor to attract the manufacturing into a particular region (Ellram et al, 2013).

However, it seems the business milieu in emerging economies is not as favorable as before. First, recently there have been recurrent complains about IPR issues in China and other Asian emerging economies. It is argued that China's enforcement of its IP laws has been inadequate (e.g. lack of action against counterfeiting and piracy), although the framework of IP protection has been well established (Wang, 2004). Second, strikes are becoming more frequent in plants in LDCs, which makes companies to loose profits. This made, for example, Honda (a Japanese car maker) to give its Chinese workers a 47% wage rise after their strike in 2010. Similarly Foxconn (a Taiwanese firm who does many of Apple's manufacturing in China) doubled its wages in Shenzen in China after a series of suicides that happened there (Economist, 2013). Third, because of one-child policy in China, the latest generation of workers seems to be not as abundant as before. Moreover, this new generation seems to be less willing to spend long hours in boring factories, especially in foreign MNEs which requires higher quality standards (and eventually more work for the worker) than the domestic firms (Economist, 2013). Fourth, a new labor law introduced in 2008 in China provides more protection for workers there, including the right for permanent employment after only a year of temporarily employment. On the other hand, United Auto Workers union (UAW), as one of the biggest unions in U.S, accepted a two-tier wage structure under which new blue-collar workers are paid only half as much as the longer-employed ones (Economist, 2013). This obviously provides incentives for large American car MNEs to bring back at least some portion of their activities back to home. All in all, (once again the same as argument in 4.1) this means that China is now offering less advantageous when it comes to labor-intensive industries. All of these four issues can violate the previous image about proper business milieu in LDCs (Wang, 2004). Such lower quality of business milieu (specially the point about IPR problem) can be understood via the concept of

opportunism, which Williamson (1981) described it as dishonest behavior by competing firms. According to *Transaction Cost Theory*, opportunism represents a source of transaction costs. It is one of the determinants whether firms will choose offshoring or vertical integration. Williamson (1981) argued that vertical integration arises out of the need to safeguard against opportunism and contractual hazards.

Furthermore, from supply chain management studies, it has become evident recently that the original offshoring decision was usually based on a tempting per-unit price, with little consideration for total cost analysis, which includes hidden costs, such as midnight phone calls, delivery delays, IP leakage, communication challenges, travels (Moser, 2011; Gray et al, 2013). Such total cost consideration in one hand, and boosting innovation in China (partly because of IP leakage and imitation) in the other hand has been argued to be a threat to western innovation-based competitiveness (Wang, 2004). Therefore, not only lower quality of business milieu in China in recent years has blurred one of the traditional motivations to move the manufacturing to China, i.e. proper business milieu, but also their imitation skills argued to be a thread for innovation-based competitiveness of western companies.

4.3. New sources for economies of scale (through new process innovations)

Economies of scale can reduce the total production cost. It can be achieved, for example, through the presence of a large number of suppliers in a particular region (or country), hence reducing the average cost of production per unit (Teece, 1986). One of the traditional ways to reach to economies of scale for western companies has been moving their manufacturing to China and other LDCs, to enjoy the presence of large number of (cheap) suppliers in a particular region. This has been especially the case for those western companies who were followers (not first movers) in term of offshoring their manufacturing to China and other LDCs.

However, recent process innovations provide the new sources of scale economies, which degrade the reliance on traditional source of scale economies (that has been moving production to LDCs). As the magazine *The Economist* wrote recently:

"It [recent process innovations] will allow things to be made economically in much smaller numbers, more flexibly and with a much lower input of labor, thanks to new materials, completely new processes such as 3D printing, easy-to-use robots and new collaborative manufacturing services available online. …And that in turn could bring some of the jobs back to rich countries that long ago lost them to the emerging world." (The Economist, A third industrial revolution, 21st April 2012)

The main point here is that the cost of producing much smaller batches of a wider variety (with each product tailored precisely to each customer's need) is indeed falling. The factory of the future seems to have a focus on mass-customization, rather than traditional mass-production. This allows for lesser reliance on economies of scale (available through extensive availability of cheap suppliers in China), which could eventually lead to return of some manufacturing parts back to western countries. This is indeed what Grossman and Helpman (2005, p. 159) argued: "disproportionate improvements in the technology for customization in a region can shift the manufacturing toward that region (here referring to the western countries, in particular US)".

One example of such "improvements in technology" is Additive manufacturing (AM). It is a relatively new manufacturing method (process innovation) that first came into use in late 1980's[5]. The more the quality of the AM fabricated products improves, the less need for labor, and hence the less labor costs. This will create a scenario where manufacturers in regions with relatively higher labor costs will be

[5] In general, it forms 3D physical objects by solidifying the raw material layer upon layer. Originally, due to its limited capacity and low resolution, the method had been used for prototyping and model making, thus the term rapid prototyping. It has since been gradually developed towards providing end-use parts or direct part production, referred to as rapid manufacturing (Tuck et al. 2008).

able to compete with those that have lower wages in LDCs. In addition, combining this competitive pricing with the concept of quicker delivery will provide local suppliers with an advantage over their foreign competitors highly competitive in their markets (Wohlers, 2011).

Moreover, the rising cost of energy and its efficacy are the major barriers for the future of manufacturing and play a significant role in shaping the geography of production. One major cost of energy is associated with wastes. AM processes are argued to be capable of producing significant lower waste compared to conventional methods (Wohlers, 2011). Another major source of overall energy costs is the cost of transportation. Much more energy is needed to ship and deliver parts from a long distance than to ship them from a local or regional retailer and supplier. Studies indicates that due to problems such as communication and tool rework and transportation costs, the actual costs of offshore manufacturing can be higher than is anticipated and believed in many cases (Wohlers, 2011). To sum up, considering the trend toward mass-customization production and need to increase domestic manufacturing and employment, the overseas production may not be the best choice (Wohlers, 2011).

4.4. Demand for US-manufacturing is in place

Apart from the supply side, recent studies shows that demand for US-made products are already in the place. A recent survey of Boston Consulting Group (BCG) in September 2012 in 5000 consumers of several countries shows that more than 80 percent of U.S consumers and, perhaps more surprising, over 60 percent of Chinese consumers prefer to pay more for products labeled "Made in USA" than for those labeled "Made in China"[6]. This result can clearly create incentives for US companies

[6] There may be two different mechanisms behind the answers of US-consumers and Chinese-consumers. The US ones may be pro US-made not only for the sake of perceived better quality, but also for the sake of patriotism issue. On the other hand, Chinese consumers' positive answer for US-made may be only for the sake of quality.

to bring back some parts of their manufacturing home. In addition to such demand incentives, there are other incentives concerning the better interaction with home customers. The PLC model argued that manufacturing production would be offshored to LDCs in the 3rd phase, assuming the strict standardization of product and lack of the need for customer interaction. This is however a strong assumption, especially if one considers the faster life cycle of a technology in recent years. This would require close interactions with home customer, even though a product reaches some degree of standardization. By being close to home customer, there would be ease of communication with consumers (and specialized suppliers) (Wells, 1969). This eventually implies that "market-determined inducement" would ease the incremental innovation for even standardized product (Dosi, 1988). Apart from ease of incremental innovation, proximity to customer would ease the better service to customer leading to higher customer satisfaction (Dunning, 1980). As a matter of fact, the manufacturing has been offshored to LDCs basically because of saving-costs forces (Vernon, 1979). Now that those forces are not at play as strong as before, it is reasonable to believe that some part of manufacturing will come back to US, to meet the customer demand on US-made brands and also to have a better interact with home customer *inter alia.* This is indeed acknowledged in recent studies suggesting a shift from resource seeking (e.g. low-cost host countries) toward strategic asset seeking (e.g. better access to home market and customer satisfaction) (Cantwell, 2009; Ellram et al, 2013).

5. Extended PLC model

Following above reasoning (4.1 to 4.4) for occurrence of manufacturing renaissance, i.e. the 4th phase in PLC model, it is possible to illustrate the characteristics of each stages of PLC. This is illustrated in Table 1.

[Table 1 about here]

Table 1 is based on Hirsch (1967) and adds the 4th phase. In terms of technology, as discussed earlier in 4.3, short and rapidly changing technology in the New Product phase was substituted by the mass-production in the Mature and Standardized phases. Then in the renaissance phase, the focus is shifted to mass-customization. This has been demanded by the market for a past several years, but has been possible to implement just recently by means of new process innovations, such as Additive Manufacturing (e.g. 3D printing). Such mass-customization may best be performed back in western countries again, mostly because of the need to be close to pioneering customers.

In terms of physical capital, the low need for physical capital is gradually shifted to high need as the product is getting mature from the 1st phase up to the 3rd phase. In the renaissance phase, there is (once again) less need to physical capital. This is true especially in recent years where the new process innovations responsible for mass-customization (e.g. Additive Manufacturing) are not infancy anymore, hence cheaper cost of machinery (Wohlers, 2011). That again motives the shifting of manufacturing to western world, as the production cost is lowered and it is not critical to be in LDCs anymore (at least mot to the extent that it was 30 years ago for instance).

In terms of industry structure, there low barriers to entry in early phase of product development, basically because the dominant design is not achieve yet and it is easier for many firms to enter the industry performing try-and-error experiments to reach the dominant design (Utterback & Abernathy, 1975). This is indeed characterized as Schumpeter Mark I in technological regime literature, where there are higher technological opportunity conditions to innovate and lower barriers for innovative entry in early phases of development (Malerba & Orsenigo, 1997). Then as product is getting mature and dominant design is achieved, there would be less entry and industry would be characterized by few giant actors (Utterback & Abernathy, 1975). In renaissance phase, it is expected to see new entries, especially as the form of spin-

offs. This is because spin-offs can be created aiming to satisfy the tailored need of customers in the form of mass-customization.

In terms of human capital, it is necessary to have more Scientific and engineering skills in order to overcome the uncertainty of the product and market. There will be less need in the later phases as the products get standardized. In renaissance phase, there might be need for both types of human capital, as this phase is characterized by both incremental innovation as well as routine production.

Finally in terms of demand structure, there is low price elasticity of demand in early phase, because of innovative and exclusivity nature of the new product (sellers' market). This will be changed as the product gets standardized (buyers' market). In renaissance phase, it is somewhat medium elasticity and it is crucial to be closer to customer again, basically because of shorter technology cycles of products. Being close to pioneering customer implies to move manufacturing back to western countries, as argued by PLC model.

It is necessary to note that the return of manufacturing to west should be kept in proportion, as most of MNEs involved in recent re-shoring are bringing back only some of their production to the west, which are destined to the western markets (The Economist, 2013). Moreover, for most of MNEs, the amount of off-shoring is still outweighs the amount of re-shoring. For instance, Caterpillar recently announced the opening of new factory in Texas, while at the same time it is expanding its R&D activities in China (The Economist, 2013). Similarly, Airbus announced recently that it will open its first U.S-based production plant in Alabama (a southern State), while expanding its production facilities in China (Airbus, 2013). This is due to the fact that China still provides the world's best supply chains of components as well a proper infrastructure for various industries. In addition, even if labor-cost may not be an incentive to stay in China (as discussed in section 4.1), still the companies have reasons at least two reasons to stay there: (i) they have already invested heavily to be

there and coming home has obvious shifting-costs, (ii) US is not the only huge market anymore, China in its own become a huge market and all the benefits of being close to customer (discussed in 4.4) could apply for Chinese market, too. Nevertheless, and at the end of the day, the Asian chairman for McKinsey recently said: "the incremental decision to invest in new production capacity in China has become tricky" (The Economist, 2013).

6. Conclusion

Manufacturing Renaissance, i.e. return of manufacturing to west, has been recently observed as a new pattern emerging in western countries, especially in US. This paper identified main drivers of this new phenomenon: (i) rising wage-levels in emerging economies (ii) lowered quality of 'business milieu' in emerging economies (iii) lower importance of economies of scale, due to new process innovations (iv) better interaction with home customers. In doing so, the paper contextualized itself within a well-established theory that explains the locational shift of manufacturing, i.e. Product Life Cycle model (PLC). Nevertheless, the return of manufacturing to west should be kept in proportion, as most of MNEs involved in recent re-shoring are bringing back only some of their production to the west, which are destined to the western markets. From western policy-maker perspective, it is still essential to provide more incentives for MNEs to bring backs their production plants to west, which eventually leads to create more jobs.

It is expected that all industries are not coming back to western world in the same pace. The return of manufacturing to the west should be more pronounced for labor intensive industries and also those industries that are weekly linked with other industries though the supply chain in LDCs, especially if one considers the significant increase in wages of LDCs.

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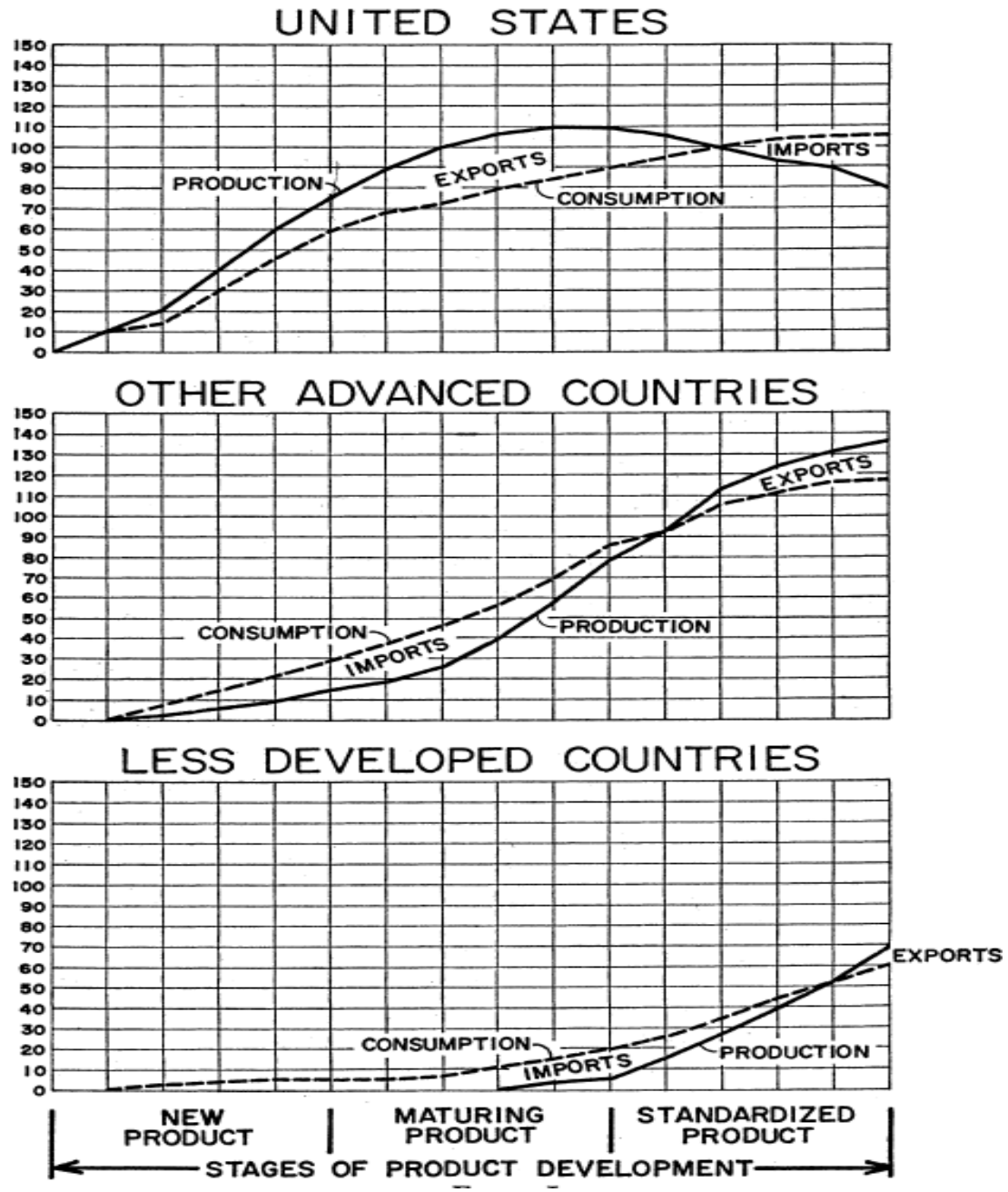
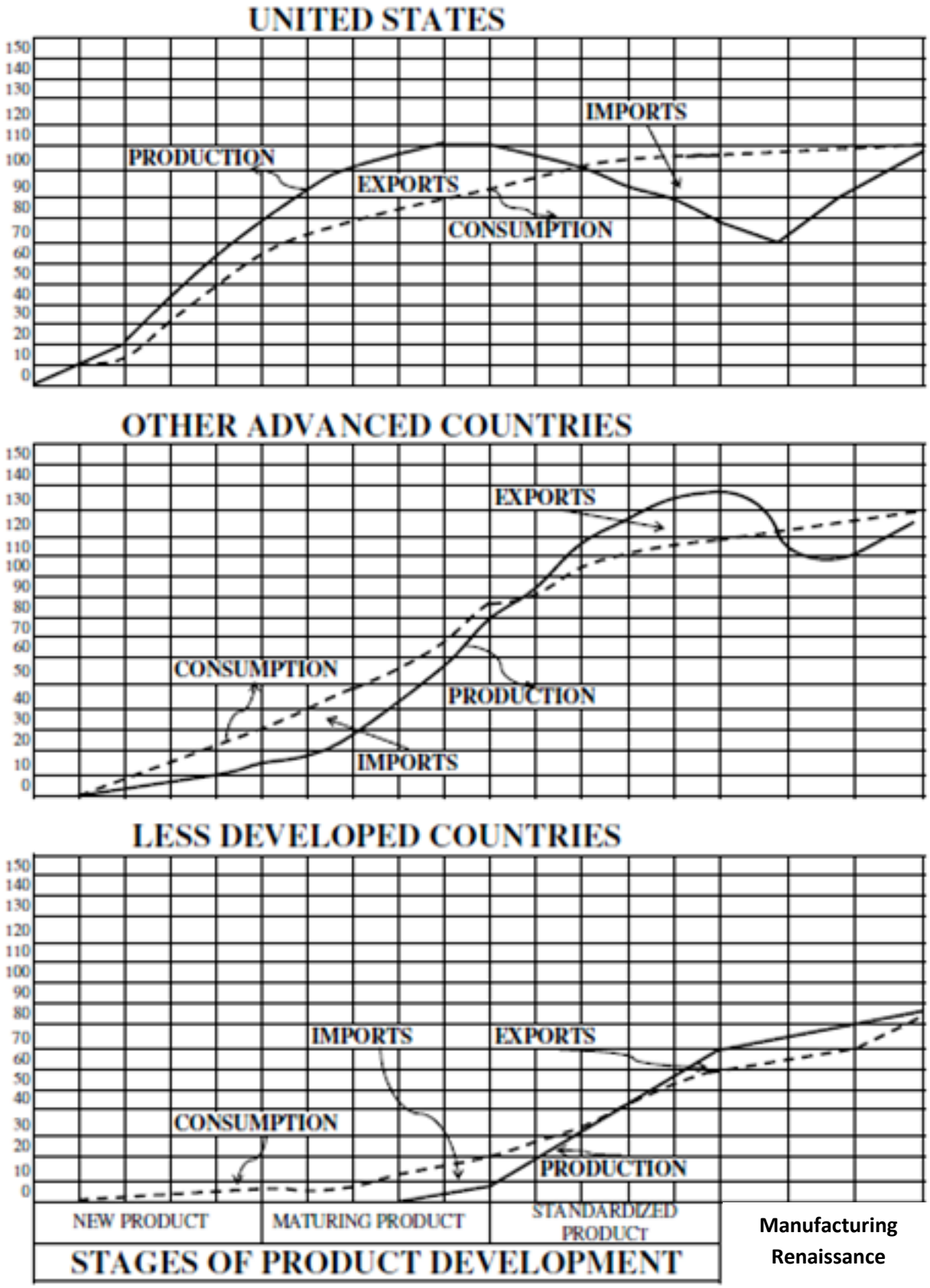
Figure 1-Original Product Life Cycle model (60s and 70s)



Source: Vernon (1966)

Figure 2- Extended Product Life Cycle model



Note: the first three phases are identical to original PLC model by Vernon (1966). The 4th phase (Manufacturing Renaissance) is the add-on.

Table 1- Characteristics of the product cycles

	Cycle phases			
Characteristics	**New product**	**Maturing product**	**Standardized product**	**Renaissance**
Technology	Short run and rapidly changing	Mass-production and importance of economies of scale	Long run and stable process	mass-customization
Physical Capital	Low	High, due to high obsolete rate	High, due to large quantity of specialized equipment	Low, due to new process innovations
Industry structure	Entry is know-how, many firms	Growing number of firms	Stagnation in number of firms	Growing number of spin-offs
Human capital	Scientific and engineering	management	unskilled	Scientific, engineering, and unskilled
Demand structure	Seller's market, Low price elasticity of demand	Growing price-elasticity of demand	Buyer's market, High price elasticity of demand	Closer to customer, shorter technology cycles, Medium price elasticity of demand

Source: New, Maturing, and Standardized product characteristics are based on Hirsch (1967). Renaissance is the own-elaboration of the author.

Appendix 1: Selected recent reshoring annoucements

SELECT RESHORING ANNOUNCEMENTS	
General Electric	The company announced in early 2012 that it was opening a water heater plant at Appliance Park in Louisville, the first new plant at the site in more than 50 years. Another plant has been retrofitted to make high-efficiency refrigerators. Eventually, GE plans to invest $800 million in Louisville, part of a $1 billion commitment to create 1,300 new jobs in the United States by 2014. Many of those jobs are being shifted from plants in China.
Caterpillar	The heavy equipment manufacturer has picked a site near Athens, Ga., for a plant that will build small tractors and excavators, investing $200 million to shift some production from Japan.
NCR	The venerable business machine company builds ATMs and self-service checkout systems at a Columbus, Ga., plant that opened in late 2009, and it plans to add another 370 jobs there by 2014, building products that were formerly made at plants in China, Hungary and Brazil.
Coleman	The iconic outdoor equipment maker announced in 2012 that it's moving production of its 16-quart plastic wheeled cooler from China to Wichita, Kan.
Methanex	The Canadian-based company will relocate a methanol production plant from Chile to a 225-acre site in Geismar, La. The $550 million project will give the company its first U.S.-based methanol production facility in more than a decade.
Horton Archery	The archery and crossbow manufacturer expanded its domestic manufacturing facility and moved all its production to Kent, Ohio from China. "Being on site to answer the phone and hear feedback from the field was one thing that we felt couldn't be done in China," says CEO Gregg Ritz.
Watts Water Technologies	The company and its Webster Valve subsidiary will make a multimillion dollar investment in a 30,000-square-foot plant complex in Franklin, N.H., that will bring an estimated 100 manufacturing jobs back from China.
Farouk Systems	The manufacturer of hair dryers moved 1,500 jobs from China back to the United States.
Chesapeake Bay Candle	The company, founded in 1994, opened a U.S. manufacturing operation in Maryland for its candles and home-fragrance products that had been made exclusively in China and Vietnam.

Source: McMeekin and McMackin (2012)