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A New Approach of Productive Models. The World that Changed the Machine**

Once again, and over a ten-year span, the worldwide automobile industrial environment has changed. At the start of 1990's, American and European carmakers seemed to be forced rapidly to adopt the Japanese system of lean production that included the active participation by workers and suppliers in achieving performance improvement objectives. And yet, a short decade later, this quasi-unanimous conviction of the superiority of the new production model seems to have lost its zest. How can one account for the economic crisis in Japan, where firms such as Nissan, Mazda, and Mitsubishi were required at the end of the 1990s to seek out capitalistic alliances or become totally absorbed in order to avoid bankruptcy? How can one account for Toyota and Honda's diminished expansion while simultaneously American and European firms are recovering to the point of leading the acquisitions-mergers-alliance dance throughout the world? These questions have been tackled by GERPISA, an international research network of sociologists and economists, pinpointing profound dependencies between production models and national institutions or „regulations".

Neue Produktionsmodelle. Von der Welt, welche die Maschine veränderte

Im letzten Jahrzehnt hat sich die Welt der Automobilindustrie wieder einmal stark verändert. Zu Beginn der 1990er Jahre schienen amerikanische und europäische Automobilproduzenten keine Wahl zu haben, das japanische System der schlanken Produktion zu übernehmen, in dem auch die Arbeitnehmer und Zulieferer zu kontinuierlichen Verbesserungen angehalten waren. Doch heute scheint die Begeisterung für das japanische Produktionsmodell verschwunden. Wie ist die ökonomische Krise Japans zu erklären, in der es für Unternehmen wie Nissan, Mazda und Mitsubishi Ende der neunziger Jahre nötig wurde, strategische Allianzen einzugehen, oder aufgekauft zu werden, wenn nicht bankrott zu gehen? Wie ist zu verstehen, dass Toyota und Honda so viel schwächer expandieren, während gleichzeitig gut erholte europäische und amerikanische Automobilproduzenten den weltweiten Reigen von Aufkäufen, Fusionen und Allianzen anführen? Die hier entwickelten Antworten beruhen auf den Analysen des internationalen Forschungsverbundes GERPISA, in dem Ökonomen und Soziologen der Abhängigkeit erfolgreicher Produktionspolitiken von nationalen Institutionen oder „Regulationen" nachspüren.

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A System that Failed to Prevent the Japanese Crisis

And yet, a short decade later, this quasi-unanimous conviction seems to have lost its zest. How come the system that was going to change the world was not able to prevent the country that gave birth to it from plunging into a long period of economic crisis, a period not yet over? How come firms such as Nissan, Mazda, and Mitsubishi, considered up to now as representative of the Japanese production model as well as other firms, were required at the end of the 1990s to seek out coroporate alliances or become totally absorbed in order to avoid bankruptcy? How can one account for Toyota and Honda's diminished expansion while simultaneously American and European firms are recovering to the point of leading the acquisitions-mergers-alliance dance throughout the world?

Drunk with their success, did Japanese firms neglect the principles of the model they had invented? In adopting the Japanese model, did American and European firms perform better than their „master"? Is *lean production* none other than a step towards a new model combining a certain number of its elements with the principles of modular production that carmakers, especially European ones, were the first to implement?

Turned more pragmatic, the firms' managers admit today that they are seeking to adopt and apply the best practices of their competitors no matter what they are. Will this less dogmatic approach, correctly recognizing that nothing is definitive, allow firms to achieve long lasting competitiveness? Does it suffice to simply add up the best practices in order to achieve high performance levels?

GERPISA believes that it can respond to all of these questions with new insight, one based on a more rigorous scientific and practical foundation thanks to research projects carried out by its members during the 1990s. In 1992, social science researchers who established the international GERIPSA group (*Groupe d'Etudes et de Recherche Permanent sur l'Industrie et les Salariés de l'Automobile*/*The Permanent Research Group on the Automobile Industry and Workers*) expressed their ambivalence with MIT's hypothesis. Some of them questioned the characterization of *lean production* and its possible adoption without important local adaptation measures, all the while recognising its general relevance. The others simply rejected the idea that a universal *one best way* could even exist. These doubts were fed by a number of observations.

Some Japanese GERPISA members underlined that important differences existed between firms in Japan as in any country, and thus it was dangerous to generalize. They also impressed upon other GERPISA members, unaware of certain facts, that a firm as emblematic as Toyota had experienced an important labor crisis in 1990 and had been obliged to implement substantial transformations in its production system.

Economist members of GERPISA outlined the particularly restrictive conditions required for a global homogenization of markets, and consequently insisted on the

probability that at least a minimum of several variants on the model would emerge. Historians recalled the failed attempts to transplant the Ford system outside the United States during the interwar period, and the superior profitability of local carmakers, thus suggesting that a model has conditions for feasibility that limit its diffusion. Sociologists questioned whether *lean production* could inaugurate a long-lasting inversion of the division of labor between conception and execution, and/or radically change the content of work. All noted that essential methodological rules had not been respected in comparisons made between firms. Hence, a formally identical component of organization, such as teamwork, can in fact fulfill different functions and target a variety of objectives in the firm. Consequently, this prevented one from concluding that *lean production*, meant to be represented by teamwork, could be easily diffused. In short, GERPISA members considered that the plurality of models was as much a plausible hypothesis deserving testing as that of the diffusion of a unique model as being solely capable of guaranteeing a firm's profitability.

This is why the international research program entitled „Emergence of New Industrial Models" was launched. It was rapidly followed by a second international research program, „The Automobile Industry: Between Globalization and Regionalization", which served as the complement to and expansion of the first program. What ensued was a long process of identifying successive problems that principal automobile firms, and a certain number of their foreign subsidiaries, had encountered since the end of the 1960s, both in the market and labor fields, as well as solutions they had attempted to implement to solve these problems. This became the means by which analyses of shared or different conditions leading towards profitability could be carried out, as well as improved understanding of the meaning attributed to changes underway, be it in the field of product policy, productive organization, and/or employment relationships (Boyer, Freyssenet, Lung, 1999).

The main and commonly shared conclusion of this international research project underlines the renewed and long lasting diversity of macro-economic and societal conditions in which firms evolve, and the variety in their strategic choices and production systems despite a certain number of apparent or transitory convergences.

This contextual, strategic, and socio-productive diversity does not necessarily render each firm unique unto itself, thus rejecting the idea of a general model. On the contrary, it is characterized by processes that enabled certain firms to adopt or invent a coherent and pertinent production system, but also by developments that prevented other carmakers from achieving lasting profitability, due to both internal and external reasons leading to one crisis after another.

At the end of the first research program, scientific coordinators Robert Boyer and Michel Freyssenet pursued this analysis and extended the research to cover earlier periods of the automobile industry, other carmakers, and numerous host countries for transplants. The objective was to provide a clear characterization of previously existing productive models, to conceptualize conditions for their emergence, crisis, and disappearance, and from a more extensive standpoint, to be capable of enumerating conditions for their profitability. The analyical framework

thus obtained was tested and developed during the second international research program, under the scientific direction of Michel Freyssenet and Yannick Lung, the goal being to improve understanding of the new internationalization processes implemented by firms in the automobile industry during the second half of the 1990s. What follows are the results both from of the first and the second international GERPISA reserch programs.

A Single Productive Model Has Never Existed

The „received wisdom“ of the history of the automobile industry divided up into three phases has become common to those who study it and those who work in it. Following a primarily „craft“- based phase that corresponded to elitist demand, carmakers are said to have adopted the mass production system, which – thanks to obtained economies of scale – allowed the market to be extended to the population at large. Because of this system’s inherent rigidity, it is said to have been thrown into crisis by the transition to a more variable, renewed, and diversified demand as well as to a far too competitive and global market. *Lean production* was meant to be the model adapted to this new configuration. However, the three supposedly successive systems are actually the result of historic amalgams and conceptual ambiguities.

From the start of the 20th century, automobile firms were industrial enterprises using tool-machines and interchangeable parts even if they assembled their vehicles on a fixed station or on non-mechanized short assembly lines (Laux, J. 1977). These did not disappear in the United States because of a lack of competitiveness with „mass producers“, but rather due to a lack of liquid assets following the Great Depression (Dan Raff, 1998). Elsewhere, not only were they maintained and even developed, but they also competed efficiently with Ford’s subsidiaries that, in the absence of mass consumption, could not be profitable in the long run. Contrary to Ford, and through supply diversity and production flexibility, they were able to answer in a profitable manner to limited and diversified markets. Several productive models were elaborated to achieve this. At least two have been identified and characterized: the „Woollardian model“ and the „Taylorian model“. The latter was not in fact itself conceived for „mass production“, contrary to many beliefs (Tolliday, 1998).

Thus the „mass production“ model – erroneously called „Taylorian-Fordian“ – in fact mixes two models, the „Fordian“ and the „Sloanian“ models, whose conditions for viability as well as specific characteristics are different despite the fact that they share the principle of the mechanized assembly line amongst themselves and with others. The „Fordian model“ implemented a volume strategy by mass producing a standard vehicle whereas the „Sloanian“ model implemented both a volume and diversity strategy by diversifying its models „on the surface“ through body, saddlery, and equipment, and by commonalizing the invisible parts and platforms. While the first model experienced a transitory and geographically limited existence, the second appeared from the 1950s on to have become the universal model, given the

development of a finely hierarchized demand ranging from bottom-of-the-line to top-of-the-line products. Indeed, a decidedly visible convergence was observed.

However, the diffusion of the „Sloanian model“ was slowed down, first by the labor crisis at the end of the 1960s, and then by the monetary and oil crises spanning 1971 to 1974. These crises even seemed to strip away any viability whatsoever of the „Sloanian model“. In fact, it met some difficulties in the United States during the 1960s, paradoxically due to its success at the very moment when it was being celebrated as the *one best way* for the second half of the 20th century. In addition, it had not been as widely adopted as managerial discourse, and hasty conclusions, had reported at the time. Indeed, it had been adopted only by a certain number of firms in only a few industrialized countries where national income distribution was carried out in a coordinated and moderately inegalitarian manner (Freyssenet, Mair, Smimzu, Volpato, 1998).

Two new industrial models were simultaneously being developed in the Japanese automobile industry: the „Toyotan model“ privileging „permanent reduction of costs at constant volume“, and the „Hondian model“ implementing a totally different profit strategy of „innovation and flexibility“. These two models were erroneously placed under the same heading of *lean production* despite the fact that they differ significantly on essential points. The remarkable performances of the firms which embodied these models (Toyotan and Hondian) did not chase however the „Sloanian model“ away. Volkswagen adopted it as of 1974, and was able to exploit it profitably in the context of a renewed market. These three firms Toyota, Honda, and Volkswagen were in fact the only ones to have a „break-even point“ that was constantly and significantly above their value added, whereas all other carmakers had experienced periods of non-profitability (Boyer, Freyssenet, forthcoming).

It is not the intrinsic and non-temporal qualities of their productive models that achieved the performance levels of these three firms. The first reason for their profitability was the adaptation of their profit strategies to their country’s „national income distribution and growth system“ that the international context favored after 1974. Floating exchange rates and oil crises, by cutting back on worldwide growth, provoked in fact confrontation between industrial economies. In that context, countries which had a growth that relied on exports, and whose national income distribution was already a function of external competitiviness, such as was the case for Japan and Western Germany were in a favorable position. Firms that were particularly favored were those that had a profit strategy based either on „permanent reduction of costs at constant volume“ such as Toyota or on „innovation and flexibility“ notably destined for export markets, such as Honda, or yet again a profit strategy based on „volume and diversity“ thanks to internationalization, the buying out of other carmakers and the commonalization of car models platforms such as Volkswagen.

Apart from fulfilling this first criterion for profitability, the aforementioned three firms had also fulfilled the second one, it is an adequate „enterprise governance compromise“ between the main protagonists of the firm concerning „product policy“,

„productive organization“, and „employment relationships“, allowing for implementation of the chosen strategy in a coherent manner. The other Japanese and German carmakers that did not fulfill one or the other of the two criteria began to experience difficulties (that no one wanted to recognize at the time due to widespread shared perception of the superiority of the „Japanese model“, and to a lesser degree, the „German model“), thus well before the turning point of the 1990s that fully revealed these difficulties.

On the contrary, countries whose growth before 1974 had relied on domestic consumption and whose national income distribution was regulated by domestic productivity gains were destabilized. These include the United States, France, and Italy, as well as free market countries having little regulation such as Great Britain. It is interesting to note that all carmakers in these countries, without exception, underwent at least one serious crisis between 1974 and 1990 and were not able to reconstruct or invent a new productive model

The international context changed once again in the 1990s. The „speculative bubble“ had already carried the three aforementioned models to their limits among those carmakers embodying them, at the very moment when at least two of them, mixed together under the same *lean production* definition, were being presented as the future of the world, a scenario identical to the „Sloanian model“ *mise en scène* in the 1960s. In 1990, Toyota underwent a severe labor crisis that forced it to change its „enterprise governance compromise“ and substantially transform its productive model. Honda at the same time made an error evaluating emerging demands, and Volkswagen, swept up by growth levels, had problems controlling its costs. Simultaneously, carmakers previously in difficulty had proceeded to drastically reorganize and implement some major strategic reorientations. The bursting of the „speculative bubble“, restrictive budgetary policies, the „emergence“ of a certain number of countries, and above all the transformation of „national income distribution and growth system“ were to change relationships between countries, automobile demand, mobilizable labor, and automobile geography.

Most industrialized countries abandoned national income distribution based on internal productivity. Some of them had adopted a „competitive“ national income distribution, that is to say, one based on local and categorial agreements. Directly or indirectly they destabilized the countries that have been privileged by the previous international context (notably Germany and Japan) and that maintained a largely coordinated and moderately unequal distribution. The nature and meaning of confrontation between countries thus changed. It is within this context that differents tendancies to recomposition of the world were to occur: general liberalization of exchange, constitution of regional spaces, reaffirmation of somes nations. In addition, „competitive“ income distribution system, through the economic and social differences thus created, gave birth to a second automobile market, that of pick-ups, minivans, recreational vehicles, and other conceptually innovative vehicles. This second market, which now has become as important as that of sedans in the United States, has attributed a new and expanded degree of pertinence to the „innovation and

flexibility“ strategy that Honda and other firms such as Chrysler and Renault subsequently adopted. Today, automobile firms must bet on the world’s recomposition type as well as the national income distribution and growth system that will prevail in the next ten years, to choose a pertinent profit strategy and to construct strong „enterprise governance compromises“.

This new representation of the history of the automobile industry derived from research at GERPISA does not offer the same simplicity as the three successive models of IMVP, that were easy to remember and apparently even easier to apply! Should this be regretted? Though it continues to prevail to this day, it presents the unfortunate inconvenience of simply being a fairy tale.

Are actors of the firms (stockholders, banks, directors, workers, unions, suppliers, etc.) now deprived of a convenient compass due to the relative complexity inherent to the new proposed representation of automobile industry history? If a number of possibilities exist, how can one choose an productive model which is economically pertinent and socially acceptable? Why have some firms not succeeded in embodying or inventing a model, and have experienced long periods of oscillationbetween loss and profit, some even disappearing altogether?

Contrary to appearances, a more complex and long term vision of the history of the automobile sector allows one to highlight general and valid rules for all periods and areas. These consist in more operational rules from a practical and scientific standpoint than those affirming the existence of a single performant model for each important period accompanied by naïve encouragement of its general adoption. The analysis of firms and subsidiaries trajectories, as carried out by GERPISA, allows us to bring two essential conditions for profitability to light and to define the possibilities of action for firm’s actors to invent or adopt production forms that can become the object of acceptable compromise by all.

Two essential conditions for profitability

These two conditions can be summed up in two sentences:

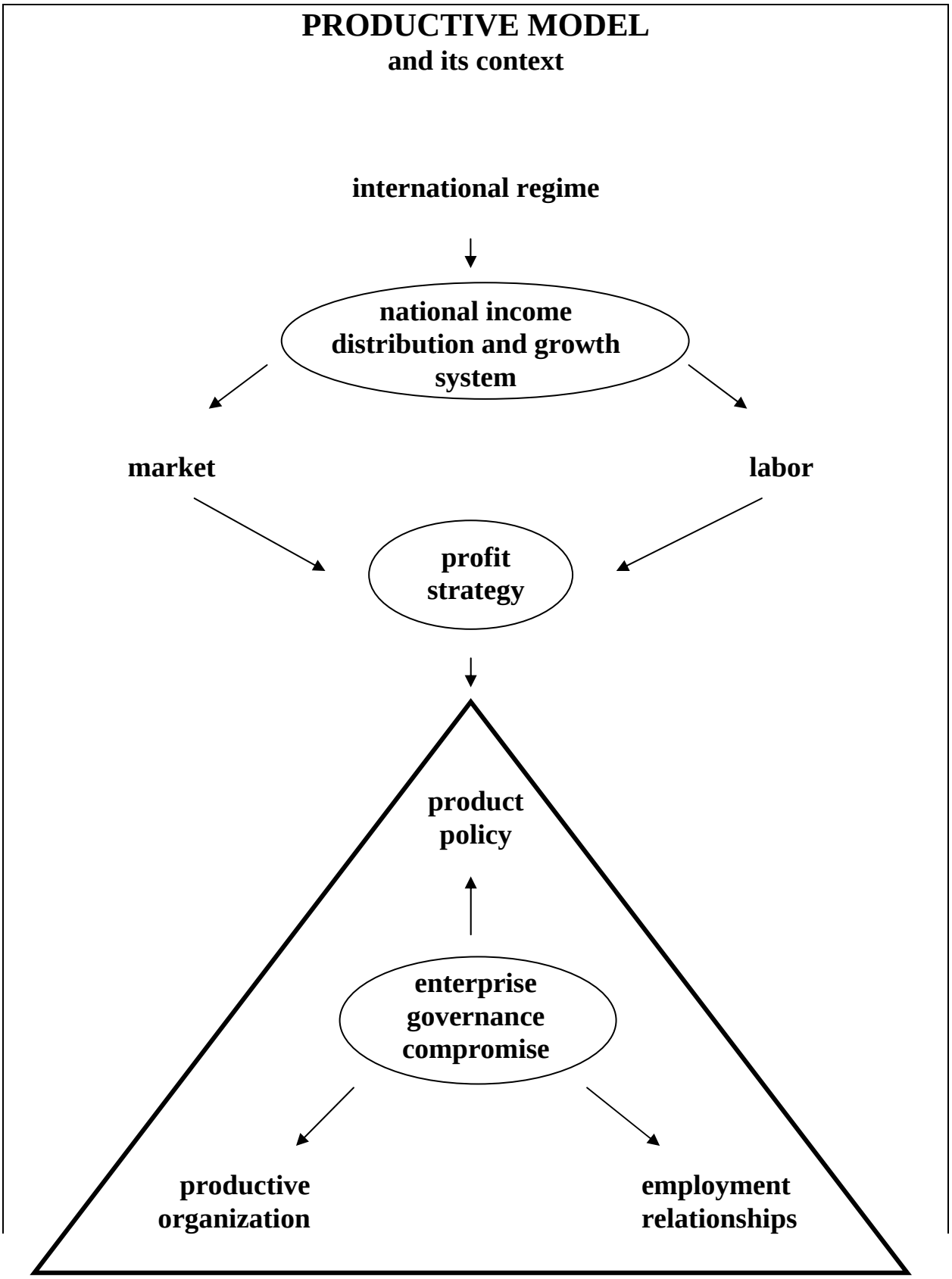
1. The pertinence of „profit strategy“ in relationship to „national income distribution and growth modes“ in those countries where the firm evolves;
2. The solidity of the „enterprise governance compromise“ that allows the firm’s actors to find and implement the means („product policy“, „productive organization“, and „employment relationships“) that are both coherent in light of the adopted profit strategy and acceptable by all these actors, in other words, the invention or adoption of a productive model.

Hence, productive models can be defined as „enterprise governance compromises“ that allow „profit strategies“ to be implemented, and that are viable within the „ national income distribution and growth system“ of the countries wherein firms are active, through coherent means accepted by all the actors.

Inversely, firms that have not succeeded in inventing or adopting a productive model, are firms that have not fulfilled at least one of the two conditions required for

profitability. Either their profit strategy was not pertinent relative to the national income distribution and growth system or else became non-viable following changes in growth systems, or a „enterprise governance compromise“ was never elaborated among the firm’s actors or else was rejected by one or several protagonists (see figure 1).

Figure 1: GERPISA, Robert Boyer, Michel Freyssenet



What is the meaning of „profit strategy“, „income distribution and growth system“, „enterprise governance compromise“, „product policy“, „productive organization“, and „employment relationships“? Historical studies have shown that carmakers have not relied on the same profit sources. Two reasons can explain this phenomenon. First, profit sources can not all be exploitable at any time and anywhere. Second, they are not all compatible among themselves due to their contradictory requirements. This is why above all firms distinguish themselves by their different combinations of profit sources, in other words, by what we have defined as their „profit strategies“. Profit source combinations do not necessarily nor always result from a conscious and/or deliberate choice, but from a progressive adjustment process (Boyer, Freyssenet, 2000).

The number of profit sources directly linked to automobile production comes to six: economies of scale, supply diversity, product quality, pertinent commercial innovation, productive flexibility, and permanent reduction of costs at a constant volume. During the first century of automobile production, carmakers implemented at least six different profit strategies that we have mentioned by name of special profit sources: the „diversity and flexibility“ strategy, the „volume“ strategy, the „volume and diversity“ strategy, the „quality“ strategy, the „permanent reduction of costs at constant volume“ strategy, and the „innovation and flexibility“ strategy.

These „profit strategies“ were not all equally appropriate at all times and in all places. In order to be so, they each require specific types of markets and labor that only certain National income distribution and growth systems provide. To illustrate this briefly, one can say for example that the „volume“ strategy – consisting in massively producing a unique product – requires (in order to be viable in the long term) continued and socially undifferentiated progressive buying power of the population as well as a labor force that accepts work conditions associated with homogenous production. In contrast, the „quality“ strategy – consisting in offering executive range models that symbolize the prestigious economic and social status of the buyer – prospers in countries where a substantially proportion of stabilized high revenues exist, and where one may also find a relatively more skilled work force.

„National income distribution and growth systems“ are not numerous and several countries can implement the same system simultaneously or at different times. This is why certain profit strategies can simultaneously be found in several areas or during several historical periods. Inversely, the same „national income distribution and growth system“ can guarantee for the viability of several „profit strategies“. This is why there is neither universal productive model, nor national productive models.

„National income distribution and growth systems“ are differentiated by the major source of growth (investment, consumption, or exportation) and by the form of income distribution („competitive“, „regulated“ in function of internal productivity or

external competitiveness, etc.). For example, the system called „competitive and competed“, because growth depends on competitiviness of each firm in national and international market and because the national income distribution system depends on local and professional agreements was that of most of the European countries before World War I and of some of them during the inter war period. The system called „consumer-oriented and coordinated“, because the growth is based on the internal consumption, the national market is protected and the income distribution is coordinated at national level in function of internal productivity gains, was that of the United States, France, and Italy from 1950’s to1970’s (Boyer, 1990). The system called „specialized exporter and coordinated“, because the growth is pushed by exporation of specialized products, the market is protected by the quality of products, and the income distribution is coordinated in function of external exchange gains, still present in Germany to day, and was employed by Sweden. The system called „price-exporter and coordinated“, because the growth is based on price competitiveness of exported goods, the internal market is protected, and the income distribution is coordinated in function of external exchange gains“ is that of Japan, South Korea, etc (Boyer, Saillard, 1995).

„Profit strategies“ can not be implemented using any means. The „product policy“, „productive organization“, and „employment relationships“ must correspond to precise requirements that are specific to each profit strategy. However, in reality, they are often the fruit of successive contradictory choices, tensions between actors and the firm, or external constraints. Rendering means coherent with the adopted „profit strategy“ can only be accomplished and maintained if the firm’s main actors first agree on the strategy itself, and then on the means. This agreement can not be concluded unless it allows each protagonist the perspective of attaining his/her own goals in the mid or long term. No coherence is possible, no profit can be a long lasting one without the construction of a solid „enterprise governance compromise“.

Fortunatelly, „profit strategy“ requirements can be fulfilled in many ways. Nothing obliges a firm to submit to the means supposedly imposed by the „profit strategy“ selected. In fact, we have been able to observe, for example, that the „diversity and flexibility“ strategy was implemented not by a single productive model, but by two different models at the same period and in the same country, that is to say the „Taylorian model“ and the Woollardian model“. Likewise, Toyota was obliged to change its „enterprise governance compromise“ during the 1990s in order to continue implementing its „permanent reduction of costs at constant volume“ profit strategy following the labor crisis that it had undergone.

The emergence or adoption of a productive model that is not based on an intellectual conversion and/or application of firmly established dispositions. These are in part unintentional processes. They imply the synchronization of conditions that render the profit strategy feasible as well as means to implement it (Boyer, Charron, Jurgens, Tolliday, 1998). This synchronization often escapes control by enterprise players, from both a cognitive and practical standpoint. It is often only after the fact that they realize that conditions and means joined together in a system, and thus they

proceed to theorize this. Conversely, when they want to adopt a model that has born fruit elsewhere, they are never guaranteed that their decisions will indeed allow for the synchronization of conditions and means, due to the fact that intervening social processes are numerous and the effects of their intersection difficult to predict. Here lies precisely the practical utility of social science research, that of identifying social processes, dissecting them, and subsequently highlighting the possibility to act so as to facilitate actions undertaken by different enterprise players in conformity with their specific perspectives.

Profit Strategies and Productive Models

The „diversity and flexibility“ strategy and the „Taylorian“ and „Woollardian“ models

The „diversity and flexibility“ strategy consists in offering specific automobile models corresponding to demands by economically and socially distinct customers who express markedly distinguished identity criteria. It also involves rapidly adapting to quantitative and qualitative variations in these demands in function of the irregular revenue evolutions of this category of customers.

This type of simultaneously „balkanized“ and unstable market is essentially found in a „national income distribution and growth system“ wherein revenue and salary formation, instead of being regulated in function of productivity or exterior competitiveness, is submitted to „competition“ in function of local and categorial power relations. The harshness of social relations leads each social and professional group to defend their acquired positions and consolidate them. In such a social and economic context, mass demand has difficulty in forming due to highly irregular revenue evolutions. This system, which we have called „competitive-competed“, was found in a number of countries before World War II, and continued to be the case in Great Britain. The „diversity and flexibility“ strategy was logically adopted by most European carmakers in the interwar period as well as British firms before the British Leyland was created at the end of the 1960s. Is this strategy now part of the past? Things are not so sure. The return to systems of „competitive“ salary and revenue formation seems to be attributing new pertinence to it.

To be implemented, the „diversity and flexibility“ strategy requires a product policy made up of coherent models, sharing a limiting number of common parts with other car-models, responsive to each demand category, and profitable unto themselves. The productive organization must allow the firm to rapidly conceive of new models at the lowest cost, and change product as often as necessary in function of demand variations. Employment relationships must offer compensation for the required level of flexibility and competence. At least two productive models have implemented the „diversity and flexibility“ strategy: the „Taylorian“ and the „Woollardian“ models. However, they differ in their „enterprise governance compromises“ as well as by the means employed.

What is called „Taylorism“ today has little to do with its historical specificity. Indeed, the „Taylor method“ can not be reduced to one or the other of its techniques – for example, timekeeping – nor expanded to the separation between conception and execution. of which it was but one historical form and certainly not the most important. In fact, Taylor had called for a complete production system in order to solve one of the most typical problems of diversified production, in small and average-sized series, fixed stations, or non-mechanical short assembly lines, that is to say what he called „worker idleness“. It is typical of this kind of production, since it no longer is a problem once the assembly line is adopted. Everyone recalls that Taylor mainly defined „worker idleness“ as a function of management practice consisting in decreasing the wage paid per piece and reducing the work force whenever an increase in hourly wages was obtained one way or the other. Hence, he proposed to reconcile high salaries and inexpensive labor by increasing the value added instead of negotiating its distribution. He confirmed that daily production could thus be doubled or even quadrupled. He guaranteed that workers would be ready and willing to work more efficiently in accordance with a sequence of operations and in „scientifically“ – thus impartial – established time frames designed by a special team in charge of analyzing and timing both skilled and unskilled tasks. The condition was that employers pay those workers accepting the new rules from 30 to 100% more than the average. The establishment of a standard sequence of operations for each task did not question its intellectual logic; as the assembly line soon would in its dispersal of operations among different work stations solely for the purpose of „saturating“ the cycle time at each work station. Taylor often repeated that the „optimal“ sequence and the time required for its execution could only be correctly determined with more experienced and efficient workers, and not by a single service isolated from fabrication, as has been endlessly reiterated over the past thirty years (Nelson, 1980).

The „Taylor method“ became the „Taylorian model“ when firms pursuing a „diversity and flexibility“ strategy adopted it, and when it was adapted to become socially acceptable. The „Taylorian model“ was characterized by an „enterprise governance compromise“ mainly established between managers, organizational engineers, and workers. It is built around the following: 1° a competitive, varied, and average-size series product policy; 2° skilled and unskilled task organization simultaneously applied in conception, fabrication, and administration, on the one hand founded on procedures and required operational modes, and on the other hand, allotted time defined by those involved and in accordance with a specialized service; 3° employment relationships wherein the wage is significantly increased if procedures and allotted time are respected or improved. This „compromise“ gave firm managers increased productivity and flexibility. Meanwhile, organizational engineers were attributed a larger scope of power, and those workers who accepted the new work rules received higher salaries. Thus, the „Taylorian“ model was profitably adopted where series were sufficiently long enough to obtain a benefit

from preparing and normalizing tasks. This was to be the case for several American and French carmakers in the interwar period.

British carmakers in the interwar period generally chose another „enterprise governance compromise“ so as to produce a variety of distinct cars destined for a „balkanized“ and limited market, and to avoid confronting a skilled and categorically organized labor force. This method consisted first in relying on individual and collective know-how as well as the autonomy of this workforce in order to obtain required levels of flexibility; second in mechanizing and synchronizing supply to fixed workstations or short, non-mechanized assembly lines to reduce intermediate stocks and handling. Demands in volume and delays were obtained by a salary system qualified as „incentive“ or „inductive“ characterized by a piece rate, which could be highly increased by individual or group bonuses attributed in function of produced volume and the time used to accomplish this. This original productive model, which we have called the „Woollardian model“ (named after Frank Woollard, production engineer at Morris, main theorist and craftsman of the method), guaranteed to firm owners and managers a regular return on invested capital, offered required quantitative and qualitative flexibility to production engineers, and attributed the requested level of autonomy and work qualification corresponding to workers' demands (Woollard, 1924, Tolliday, 1998, Zeitlin, 2000).

As one may easily observe, the „Taylorian“ and „Woollardian“ models were completely different yet implemented the same profit strategy. These models encountered a crisis when the profit strategy they implemented lost its pertinence, for example when the distribution of national income becames more coordinated, predictable, and moderately inegalitarian. The firms that progressively made up British Leyland in the 1960s and 1970s failed to become again profitable trying to make the transition from the „Woollardian“ model to the „Taylorian“ model that they hoped would bring about a greater degree of discipline among workers. The reason was the Taylorian model was also ill-adapted to the new British national income distribution and growth system.

The „volume“ strategy and the Fordian model

The „volume“ strategy consists of distributing costs among the largest number possible of vehicles, costs that are not immediately adjustable to demand. The best implementation of this strategy is the massive production of a unique model for as long as possible. It demands a growing and homogeneous market that is satisfied with one or a few standardized models, and also requires a sufficient quantity of workforce that accepts an undifferentiated production and work.

This explains why the „volume“ strategy“ was only temporarily viable during very short phases of mass automobile market take-offs, such as Henry Ford's Model T and Volkswagen's Beetle. Only egalitarian regimes based on a centralized and/or administrated economic system could, in theory, guarantee „volume“ strategy conditions over the long term. However, the latter generally do not provide the means

to efficiently implement this. An example is the Avtovaz experience in the case of the Soviet economy. Irregularity of supply and the impossibility of making investment, salary, and workforce volume decisions did not allow Avtovaz to obtain the same results as Fiat's Mirafiori plant for its Togliattigrad plant, even though the former was its direct transposition. Indeed, a technical tool only is efficient when the employment relations are coherent with it.

Hence, the „volume" strategy requires the following in order to be implemented: conceiving a product that responds to basic demands for individual transportation of the population at large, a stabilized productive organization allowing for standardized production in regularly increased and continuous flow, and sufficiently attractive employment relationships so the firm may benefit from an increasing volume of workers, but sufficiently constraining so that they accept repeating similar tasks.

The „Fordian" model has responded to these demands with a product policy consisting in offering a unique, „integrated", reliable, and inexpensive car model to the population at large or to an average clientele within each large segment of the market; a standardized, continuous, and strongly integrated productive organization based on mechanized displacement of the product, task breakdown into elementary operations redistributed among work stations with the sole purpose of saturating cycle time periods; and employment relationships guaranteeing workers lacking required skills a fixed salary that is not dependent on profits, and whose buying power regularly progresses (Hounshell, 1984 ; Freyssenet, 1998). Volkswagen was able to develop the most robust Fordian „enterprise governance compromise" and proved to be profitable for almost twenty-five years (Jurgens, 1998).

The „Fordian" model experienced a crisis long before the market become a renewed market in countries where it had been applied. Indeed, national differentiation in revenues and automobile demand rapidly reduced the viability of a „volume" strategy and „enterprise governance compromise" based on rigid organization and uniform and high wages.

The „volume and diversity" strategy and the „Sloanian" model

This strategy combines two profit sources, volume and diversity, have long been considered as incompatible. In the 1920s and 1930s, General Motors found the solution to overcoming this contradiction by having different models share a maximum number of invisible parts among them, thus reducing diversity to one only perceptible by the customer, in other words, body, sadlery and equipment.

This strategy is only possible if „surface" diversity is commercially acceptable. For this, demand must be moderately differentiated from an economic, social, and geographic standpoint. This can only be found in countries where national income distribution is nationally coordinated and moderatly inegalitarian. The „volume and diversity" strategy also implies having an abundant workforce at one's disposal that accepts polyvalence in order to face variations and variety in production. These conditions were fully satisfied in a certain number of industrialized countries

beginning in the 1940s in the United States and Sweden, the 1950s in West Germany, France, and Italy, the 1960s in Japan and Spain, and the secont part of 1980s in South Korea. Since the 1980s, generally speaking, these conditions have become less satisfied. The introduction of more „competitive“ income distribution, notably in the private sector whereas public sector wages remain coordinated and moderately inegalitarian, contributed to the emergence of a more dispersed second automobile market (four-wheel drive, pick-ups, recreational vehicles, monospaces, etc.) for which the „volume and diversity“ strategy is less pertinent.

The product policy of a „volume and diversity“ strategy must therefore consist in a finely hierarchized range covering the principle segments of the market, and generally excluding both very low and high quality models as well as „niches“ vehicles corresponding to only a small number of customers. Productive organization must allow for diversity and variations in demand among vehicles, versions, and options, so that both over and under capacities will be avoided, and so that complexity in supply, conception, fabrication, and distribution be fully controlled. Insofar as employment relationships are concerned, they must fulfill two requirements: attract an abundant number of workers while valorizing polyvalence, and remain coherent within a moderately inegalitarian national income distribution system.

The „Sloanian“ model (named after Alfred Sloan, under whose presidency this model was theorized and constructed at General Motors) is the model that implemented the „volume and diversity“ strategy. It relies on an „enterprise governance compromise“ essentially established between managers and one or several powerful and professionalized unions. It thus takes on the form of a „social compromise“ wherein accepting work organization and promoting social peace is compensated by programmed growth in worker’s buying power, promotions in the workplace, and the expansion of both social protection and union rights. The „Sloanian“ product policy is multi-brand, offering parallel ranges whose models of same market segment share the same platform while offering a number of versions and options. Productive organization is characterized by the centralization of strategic choices and the decentralization of their implementation within divisions; relying on subsidiaries or sub-contractors for numerous components so as to displace a part of diversity to them and to benefit lower prices due to their economies of scale obtained thanks the orders from other clients; machine polyvalence (multi-specialized) and mechanical assembly lines with buffers to saturate the production tool despite vehicle variety. Employment relationships consist of applying the „enterprise governance compromise“ under the union’s control, and in the name of polyvalent workers paid in function of job evaluation of work stations they successively have (Volpato, 1984, Kuhn, 1986).

Product policy and productive organization were clearly defined as of the 1930s by General Motors. But the „Sloanian“ model was only genuinely formed in the 1940s. To obtain the synchronization of the „volume and diversity“ strategy and sloanian employment relationships with the American „national income distribution and growth system“, one had to await that income distribution becomes coordinated and moderatly inegalitarian. This synchronization strarted spectacularly by the

agreement concluded at General Motors after a 113-day strike in 1946, and then served as a matrix for wage policy nationwide. It was at the origin of the „abundant years“ period, later called the „Fordist“ period, an erroneous labeling and quite unjust for Sloan. Ford and Chrysler also adhered to the Sloanian model. The progressive adoption by most industrialized countries in the 1950s and 1960s of the same income distribution as that of the United States, even if the origin of gains was different, led several carmakers to try to adopt „Sloanian“ model: Peugeot, Renault and Simca in France, Fiat in Italy, Nissan in Japan. A „one best way“ seemed to have been found, and during the 1960s many experts announced the necessary convergence of all productive systems towards this productive model (Sloan, 1963 ; Freyssenet, 1998, Volpato, 1983, Raff, 1999).

The „Sloanian“ model began to encounter some difficulties at the end of the 1960s. As we all know, it can only last if its profit strategy can be continued and all concluding parties respect the „enterprise governance compromise“. While being presented as the „machine“ generating the society of abundance and leisure, productivity gains it had generated began to decline in the United States following stagnation in economies of scale. The American market began a renewal market and exports and commonalization were unsuffisant for growth in volume. In France and Italy, the difficulties of „Sloanian“ model came from the rejection by younger generations of „enterprise governance compromise“ (Freyssenet, 1996, 1997 ; Camuffo, Volpato 1998) These difficulties could have been surmounted if monetary policy enacted by the United States to readjust their progressively deteriorating trade balance had not, through a series of domino effects, led to the oil crisis and interruption of world growth rates. Countries whose „National income distribution and growth systems“ were „consumer oriented and coordinated“ were destabilized by countries whose systems were „exporting oriented and coordinated“. From this moment, the „Sloanian“ model encountered in these latter countries better conditions for long life due to economies of scale brought on by exports and to income distribution based on external competitiveness. From 1974 on, Volkswagen successfully applied the „Sloanian“ model through a policy of growth outside of the European arena, the systematic commonalization of platforms for purchased brand car models, and export (Jurgens, 1989).

The „quality“ strategy, seeking a model for long-lasting profitability

The term „quality“ signifies not only reliability and the vehicle’s performance level, but also – and perhaps even moreso – the social distinction of a particular style, the use of certain materials, refined finishing touches, a high price and the prestige of a brand that reflects the aspirations of wealthy and distinguished customers ready to pay the price. This strategy leads firms adopting it to specialize in luxury range products, or more recently, to respond to the superior portion of each market’s segment. This is why firms are often called „specialists“ as opposed to „generalist“ firms that produce for the large mass of consumers. Profits are essentially generated from price margins authorized by the product and executive range oriented customers.

The „quality“ strategy has the largest degree of relevance in both space and time. Only a few societies lack a wealthy population category ready to pay a high price so as to possess products that represent their high-ranking economic and social position. This is why the luxury and executive range market was first and foremost an international one, and still remains so today. But the „specialized exporter and coordinated system“ is in favour to „quality“ strategy.

For the period more particularly studied by GERPISA, that is to say, particularly since the 1960s, no firm having adopted the „quality“ strategy (BMW, Mercedes, Saab, and Volvo) experienced a break-even point constantly above added value. Though their profit strategy was appropriate, their „enterprise governance compromise“ was not sufficiently robust – despite a socially favorable environment – to overcome the labor crisis all these firms encountered, not only in the 1960s like so many other carmakers, but also in the 1970s and 1980s. Nor did it allow them to control supplier costs. All these firms attempted to apply „socio-technical“ solutions to the labor crisis, for example, by considerably enlarging cycle times, introducing modular work, and/or systematically improving work station ergonomics. In addition, the image of quality itself, essential to maintain for obvious commercial reasons, could be reinforced by publicity concerning new production methods (Gerst, Hardwig, Kulmann, Schuman, 1999). They were presented more dignified than „mass production“ methods for the demanding customer who wanted „his/her car“ to be the object of special attention. Volvo went the furthest along the path of „work reform“ by radically splitting from the assembly line, replacing it with assembling in fixed parallel stations, notably in its new Uddevalla plant (Ellegard, Engström, Nilsson, 1991 ; 1995, 1999). But both at Volvo and other firms, employment relationships and product policy were not coherently conceived of in relation to the new productive organization so as to generate as much benefit as possible in terms of personalization of response to demand (be it in the realm of delays, costs, product improvement and adaptation, and service).

Rising costs, unfavorable exchange rates, unemployment growth, and price wars brought about a limitation and finally the abandon of this chosen path. However, a new „enterprise governance compromise“ concerning new product policy, productive organization, and employment relationships was not established. General Motor’s and Ford’s take over of Saab and Volvo, respectively, most probably hails a radical trajectory change for both Swedish carmakers (Berggren, 2000).

The „permanent cost reductions at a constant volume“ strategy and the „Toyotan“ model

With this strategy, cost reductions at a constant volume occurs continuously and in all circumstances. Other profit sources are additionally exploited only if they do not inhibit the main priority, that of reducing costs at a constant volume. The goal is to be prepared for any eventuality so as to remain profitable since nothing is really ever sure. This consists in reducing cost prices both internally and vis-a-vis suppliers through continuous savings.

This has been Toyota's strategy since the 1950s. It is particularly adapted to a „national income distribution and growth system" based on the export of competitive products through pricing and to an income distribution system determined by exterior competitiveness (the „price-exporter and coordinated system").

To be implemented, it requires a product policy that chooses to ignore innovative models because of their high financial risk. It also requires a constantly evolving productive organization that is not based on technological take-offs so as to eliminate „waste" of all sorts, as well as employment relationships that tolerate continued reduction in the number of workers at constant volume.

The Toyotan model answers to these demands with a product policy that aims at satisfying average demand in each large segment of the market. This is accomplished by offering models whose commercial characteristics are well grounded, have little excess in diversity (such as options), and are planified quantitatively so as to grow regularly (Lung, Chanaron, Fujimoto, Raff 2000). The method consists in applying a „just-in-time" productive organization both internally and with suppliers, the goal being to reveal problems inhibiting a continuous and regular flow at the origin of waste in time, workmanship, materials, energy, tools, and space. In addition, employment relationships motivate workers to reduce standard time spent within each workstation by making wages and promotion dependent on the accomplishment of cost reduction management goals (Cusumano, 1985, Shimizu, 1999).

Managers, workers, and suppliers essentially agree upon the „enterprise governance compromise". It is based on large-scale workers and suppliers implication. In exchange workers obtain job security, wages increase, and promotions, and suppliers guarantees for a volume of production and profits.

Up to the 1990s, the Toyotan model conferred an exceptional degree of expansion and profitability upon the firm. It thus appeared to be the „optimal" model since it guaranteed for a firm's competitiveness, worker participation and job security, as well as general satisfaction on the part of all buyers (Durand, Stewart, Castillo, 1999). However, competitiveness is not guaranteed in all circumstances. When a demand for innovative models develops, the firm incarnating the Toyotan model cannot respond. It has no other choice but to copy and improve upon innovative models already on the market as quickly as possible. That is why a firm like Honda was able to develop and become profitable alongside Toyota. The Toyotan model is shaken by brutal changes, be they in exchange rates or currency parity levels, that can strike down with one blow all the patient and continual efforts demanded of both workers and suppliers. Pushed to its limits in a tense labor market coupled with explosive demand, it is then criticized by workers, as was the case in Toyota. At the beginning of the 1990s, Toyota had to substantially change its model to the point where, in all exactness, it will soon have to be called by another name once a new „enterprise governance compromise" has been elaborated (Shimizu 1999 ; Fujimoto, 1999).

The „innovation and flexibility" strategy and the Hondian model

This strategy consists of designing conceptually innovative models that respond to emerging expectations and demands, produce them massively and immediately if commands confirm this anticipation, so as to make a profit from the risk taken before competitors then choose to invest in the newly created market segment; or, on the other hand, to abandon the innovative model(s) rapidly and at the least cost in the event of commercial failure. This was Honda's strategy from the moment it entered the automobile industry. It also has become Chrysler's strategy that, since the end of the 1980s, has reunited with its former conceptually innovative model policy. Last but not least, it has been Renault's strategy since the beginning of the 1990s.

This strategy presupposes „National income distribution and growth systems" where by the needs and lifestyles of social categories evolve periodically or where economically and socially distinctive population categories emerge. This is particularly the case for „National income distribution and growth modes" wherein income distribution is more „competitive". Different social or professional categories of the population are periodically privileged by this form of distribution and seek to translate their new and favorable economic position through an automobile demand that distinguishes them from others and/or responds to their very specific demands.

However, the history of the automobile industry is made up of firms pursuing the „innovation and flexibility" strategy that have failed whereas demand for innovative cars still remained present due to adequate income distribution system. Indeed the risks of this strategy are apparent. Among them: an innovation that does not (or poorly) find its public, over or underestimation of the demand's latent volume, loss of capacity to successfully innovate over the long term, refusal by investors, the temptation to follow in the footsteps of the „big generalist firms" following an initial success. To be implemented, the „innovation and flexibility" strategy requires that the firm takes necessary financial risks and be capable of regularly offering commercially pertinent innovative vehicles. It requires a very reactive productive organization, be it in the realm of conception, fabrication, and/or distribution, so as to respond to and saturate demand before competition copies the model. The productive organization must likewise be capable of withdrawing the model rapidly and at the lowest cost if it does not find a public. It must establish employment relationships that encourage useful innovation and the capacity to completely change production projects at all levels of the firm.

Today, of the three carmakers pursuing this strategy, only Honda has genuinely constructed a productive model that responds to all these demands. It did so even though it was still producing motorcycles, then consolidated and completed it when it became a carmaker. The model that one may now call „Hondian" answers to the „innovation and flexibility" strategy demands through a conceptually innovative product policy, each model having their own platform, yet forming an entirely coherent technical and stylistic structure. It is also based on productive organization characterized by a low integration rate to limit negative financial impact in the event of failure, and inversely, to respond more easily to success. In addition, the production structure is easily convertible without having to rely on large-scale

engineering efforts. This means low automation level, and innovators allowed to express themselves in conception, to create their teams and accomplish their chosen projects. Employment relationships favor the emergence within the firm of technically and commercially competent innovators found at all levels thanks to recruitment, salary, and promotion policies that value expertise and individual initiative more than a diploma, age, or seniority, and in same way more than hierarchical responsibilities. Last but not least, the firm boasts good working conditions, offering the lowest annual, weekly, and daily work periods of the sector (Mair, 1994, Freyssenet, Mair, 2000).

The „enterprise governance compromise“ that founded the Hondian model was agreed upon by managers (legitimized by their own personal innovative qualities and/or their capacity to value those of others for the benefit of the firm and its employees) and employees themselves who where called upon to express their personal ideas and experiences regarding the product and its process. It therefore excludes banks, shareholders, and suppliers who generally refuse the indispensable necessity of taking risks. The firm is self-financed and has not established a single association with suppliers.

However, Honda has also experienced difficulties with the „speculative bubble“. It believed that demands within the context of long lasting growth were for increasingly luxurious and executive range vehicles and sports cars, and thus completely neglected the emerging demand for monospaces and recreational vehicles. Only recently has it (successfully) rectified this approach in product policy by launching the much appreciated leisure vehicles.

Again the world changes the machine: new income growth and distribution systems, new confrontations between countries, and the recomposition of the world

How can the preceeding analysis approach allow phenomena observed during the 1990s to be interpreted, such as the decrease in competitiveness gaps between carmakers, turnaround of European and American firms, difficulties encountered by certain Japanese firms, the new globalization wave, the emergence of newly industrialized countries accompanied by implantations of new carmakers, regional or worldwide organization of firms, mergers-acquisitions-alliances, the explosion in demand for recreational, semi-utilitarian and „niches“ vehicles, the new importance of shareholders, etc..

The two world confrontations and their outcomes

Indeed, the beginning of the 1990s represents a major turning point, notably concerning the consequences emanating from a double confrontation: one between capitalist and communist countries, and the other between on the one hand countries that are consumer-oriented, protected and having a nationally coordinated and moderately inegalitarian income distribution based on internal productivity gains, and on the other, those that are export-oriented, protected, also having a nationally

coordinated and moderately inegalitarian income distribution, but based on exterior competitiveness.

As a surprise to many, the first confrontation led to the implosion of the vast majority of communist countries as well as the access to new areas for capitalist firms, particularly in the automobile industry. The confrontation with the „Socialist camp“ had largely contributed to the emergence of newly industrialized countries, particularly in Asia, with the design of protecting them from coming under Communist regime. Notably thanks to access to the United States market, these countries were able to adopt an industrialization path based on the export of manufactured products, first at low value added cost, and after with higher value added, all the while protecting their domestic market.

The second confrontation did not culminate in the convergence of all countries towards the „winner“ income growth and distribution system, that is „export oriented, protected and coordinated distribution in function of external competitiveness gains“ system. During the eighties, the countries applying it were considered as a model (the Japanese model, the German model, the Swedish model). Though France and Italy moved closer to this model, the United States chose another path. They conserved their „consumer-oriented“ growth, but adopted a new national income distribution based on „competition“. Revenue structure and demand were modified as well as employment conditions and mobilizable labor. Massive injection of public financing during the 1980s, the oil „counter-shock“, changes in the equivalence of monetary exchange , new facilities to create a firm, adjusting employment and wages and mobilizing capital, all these factors contributed to a growth cycle that, since the 1990s, has made the United States the country upon which the rest of the world’s growth depends. In addition, the liberalization of capital circulation and investment has significantly enhanced the position of one actor in the firm, the shareholder. Beginning in the United States then spreading to other countries, shareholders have been demanding increasing amounts of return on their invested capital (Boyer, Freyssenet, 1999).

From that point on, countries with a nationally coordinated and moderately unequal income distribution were destabilized. This first occurred in Japan, Germany and Sweden, but also in France and Italy, the latters having extroverted themselves somewhat, all the while limiting deregulation of wages. European countries and Japan had difficulty reacting, the former due to their restrictive budgetary policy, the latter due to financial uncertainty increasingly slumping domestic demand. European countries always had – and still have – one alternative; the regionalization of growth and exchange, in other words, the European Union, whose growth can still be self-centered and whose income distribution can be regionally coordinated while not being too dissimilar. Japan’s historical and political isolation within its own region deprives it of this perspective, unless the crisis of emerging Asian countries, and pressure from the United States to further open up their borders (the Communist threat – or supposed – having disappeared) succeed in convincing Japan’s neighbors to regionally group together with Japan.

Effects of the worldwide double confrontation on the automobile industry

The change in „National income distribution and growth systems“ in certain countries belonging to the Triad, the introduction of some limited „competitive“ modalities in wage and revenue formation in others, the liberalization of capital circulation, the emergence of new industrialized countries and their ensuing crisis, the transition towards a capitalist economy by former Communist-regime countries in Eastern Europe and Asia, contradictory trends in the world’s recomposition between globalization and regionalization, and the reaffirmation of a certain number of very important nations, all these factors have had several effects on the worldwide automobile industry (Boyer 1988, 1990, 1996):

- a change in power relations between carmakers as well as between actors within the firm;
- strong growth followed by a drop in automobile demand in emerging or former Communist countries;
- the creation of a second automobile market, that of semi-utilitarian, recreational, and „niches“ vehicles corresponding to new categories of the population engendered by their more or less fortunate income in the competition for share of internal productivity gains or external competitiveness.

Changes in power relations between carmakers as well as between actors within the firm

This initial effect was observed in the difficulties experienced by Japanese, Korean and East-european carmakers during the 1990s, while simultaneously witnessing the recovery of American and European carmakers. Tensions provoked by the speculative bubble, a slump in the Japanese domestic market, the yen’s valuation, effects brought about by American and European restructuring on Japanese competitiveness, all these factors revealed the limits of Japanese carmakers and even the high degree of fragility among some of them. Notably, Nissan, Mazda, and Mitsubishi, firms that had not constructed a solid „enterprise governance compromise“ and had gone into considerable debt, could not resist. Only Toyota and Honda, which had been self-financing their development for quite some time in conformity with their own „profit strategy“, could not only preserve their independence but also pursue their growth. Nevertheless they did not entirely preserve its dominant position, in relation to American and European carmakers. Once again, it was the „world“ that changed the „machine“ by modifying conditions and possibilities for the implementation of profit strategies and productive models .

This reversal of the world conditions was seized upon by a certain number of European and American firms that perceived themselves as being too regionalized. They considered their globalization as a necessity for their profitability in the future. They took control of Japanese, Korean or East-european firms: Ford of Mazda, Renault of Nissan, Dacia and Samsung, Daimler-Chrysler of Mitsubishi. Many

American and European automobile firms competed to take control of Daewoo and to form an alliance with Hyundaï, and may be Avtovaz (Freyssenet, Lung, 2000).

Among the various measures employed by certain American, European firms, and now Japanese firms, to lower their break-even point, to improve control variety, and to adjust more easely their production capacity to circumstantial variations in demand, there is one that stands out due both to its long term and worldwide ramifications: the outsourcing of a number of activities in conception and fabrication to (already or recent) independent first-rank suppliers. These suppliers have in fact been put in a position to structure and manage automobile activity in their area of competence. They have acquired great importance, and only the future will tell if carmakers will be able to control them (Eckardt, A., Köhler, H-D., Pries, L. (1999).

The liberalization of capital circulation, designed to facilitate new investment, has also modified power relations between the firm's actors. It has allowed shareholders to have mobile capital to demand improved returns. They push managers to reorientate the firm towards potentially more profitable activity, notably services linked to the automobile. A new player in the construction of „enterprise governance compromise" obligates a change in the productive model. However, it is important to recall that many carmakers have strived to maintain their financial independence, notably the three most profitable firms: Toyota, Honda, and Volkswagen.

Just what is emerging?

The development of automobile markets in emerging countries and in former Communist countries has encouraged the quasi-totality of carmakers to go there, searching a volume growth that they can no longer obtain from the Triad countries. They thought that eventual upsets in the development of some of these countries or in transition for the others would not affect the irreversible trend towards growth. Long before the Asian crisis and ensuing shock waves, GERPISA's analytical approach had led it to express some doubts about these predictions for several reasons. The so-called „emerging countries" owed their growth to the export of manufactured products at a growing added value to those industrialized countries who did not oppose this type of growth, for geo-political, economic, or social reasons. However, since the disappearance of the „Socialist camp" and success in exporting at higher value added by these countries, one could observe increasing pressure placed on them, to open their markets. Hence, their growth rate was not guaranteed to evolve at the same rhythm. The 1997 financial crisis also revealed that development in these countries had relied on debt, and that local deficient and blind international institutions had allowed this to reach an intolerable level, at least from a long-term perspective. Did this Asian crisis provoke the painful but beneficial rectification allowing emerging countries to start again on a more healthy and solid basis? This is possible but not entirely certain (Humphrey, Lecler, Salerno, 2000).

These countries will now have less control of their development since American and European firms have taken over certain important local firms that have gone bankrupt, notably in South Korea. They will also have to rely more on domestic consumption. Yet (with the exception of South Korea), national income distribution remains highly unequal in this area since the 1980s, inequalities even increasing considerably since the crisis. The constitution or consolidation of a middle class susceptible to generating mass automobile demand is constantly put off by periodical financial or political crises. In addition, there is little chance that these countries will adopt a nationally coordinated and moderately inegalitarian distribution system in the near future. Automobile demand will certainly develop, however it will revolve more around demand for luxurious and executive-range cars and light trucks, and extremely low priced vehicles that remain to be designed, rather than demand for wisely hierarchized sedans.

Insofar as former Communist countries are concerned – beginning with the foremost among them, i.e. Russia – it was obvious that in the absence of institutions allowing for a market to function, these countries were not able to make a rapid transition to capitalism, one that is profitable to firms offering equipment products to the population at large, such as the automobile.

Anticipation made by firms for the future of these countries were probably both quantitatively and qualitatively erroneous. As of now, capacities installed seem too extensive in relation to mid-term demand previsions within this new context. Fiat is certainly the carmaker that has the most harshly experienced the turn around of markets in emerging countries, due to its massive financial and human resource investment there, to the detriment of the European market. Recorded losses most probably explain its alliance with General Motors.

The two automobile markets

Since the mid 1980s in the United States and the 1990s in Japan and Europe, a demand for conceptually innovative vehicles from a practical and symbolic standpoint has emerged, especially in industrialized countries: light trucks, sports utilitarian vehicles, monospaces, recreational vehicles, urban four-wheel drives, „niche“ cars, mini-cars, etc. Today this demand represents between a quarter to a half of the automobile market, according to the country. Its concomitance with the deregulation of revenue formation is striking. Thus, it appears that the second market emanates from new categories of the population that express through automobile demand their own economic and social trajectory. This radical change in the market structure has had several consequences.

It has rendered the „innovation and flexibility“ strategy (adopted by Chrysler and Renault, following Honda) much more profitable than before. It has allowed Ford and General Motors, imitating Chrysler, to encounter less competition from Japanese carmakers and their transplants, and to generate substantial profits. On the other hand, it has created harsh mid-term dilemmas that need solving.

If the second automobile market is consolidated and even extends from a volume standpoint, it will destabilize carmakers pursuing a „volume and diversity“ and „reduction of costs at a constant volume“ strategies. Indeed, it requires that firms regularly offer innovative vehicles to new and renewed population categories. However, as we have seen, the risk involved with conceptually innovative vehicles is that it conflicts with these strategies. The firms that implement them will be obliged to imitate the innovative car models. But will they obtain the required level of volume to make profit? Indeed the „innovative and flexible“ firms will always know how to saturate new demand quickly once the market has validated proposed innovative models. Likewise, the „innovative“ vehicle supposes that it differs from classical models, and not only on the surface. If the market becomes more and more balkanized, and due to a national income distribution more „competitive“, the commonalization of classic and innovative car platforms will be less acceptable to the customers.

The sedan classical range is not fixed. A top-line demand of small and medium cars and recreational vehicles emerged, along with new buyers for luxury cars. These tendencies explain the attempts of Mercedes (through Classe A and Smart) and BMW (through the purchasing of Rover), as their decision to relaunch the brands, Maybach by the first, Rolls Royce by the second. One of these attempts was a rapid failure: BMW has been forced to sell Rover.

These are some of the dilemmas facing firms today. They explain the need to have a new range of models and certain mergers and acquisitions. Some carmakers, unable to clearly evaluate the evolution in market structure, have decided to be present everywhere and to be prepared for any eventuality. However this type of policy seems more a reflection of despair than a reasoned strategy.

The Daimler-Chrysler merger, increasingly seen as the former acquiring the latter, and Mitsubishi compromise“ obligates again the productive the desire to become a worldwide firm and to have models for all segments of the market: top-of-the-line in each segment, the first market (mass oriented and hierarchized), the second market (innovative varied and variable models). Yet as one can easily observe, this involves cumulating all sorts of risks and challenges simultaneously. One must remember that up until now, no single firm has successfully and profitably implemented the cohabitation of two different profit strategies, particularly that of „innovation and flexibility“ with any other.

Renault and Nissan will probably encounter similar problems. If the takeover of Dacia to produce a 5.000 euro model for an emerging market is coherent with Renault’s „innovation and flexibility“ strategy, this is not the case for its alliance with Nissan. Their respective profit strategies are for the moment incompatible. There are two solutions: they both adopt the same profit strategy, or, they invent an innovative path to render them compatible.

The objective to respond to all kinds of demands also explains the succesive takeovers of Jaguar, Aston Martin, Volvo and Land Rover by Ford. Volkswagen

itself implemented a strict „volume and diversity“ strategy which commonalized the platforms of its four brands of classic sedans, and now want to make them all: luxury cars with Bentley, Lamborghini et Bugatti, recreational vehicles, heavy trucks with Scania.

Among recent mergers and alliances, the alliance between General Motors and Fiat, potentially presents less difficulties. The two carmakers pursued the same profit strategy on different markets. They can commonalize with profit, the platforms of their models which share the same market segment. However they must do this quickly ; and with a coherent product policy at european level, applying it on a global scale.

Will it become necessary to invent a new „profit strategy“? Are there new opportunities for „reflexive production“?

This hypothesis must be considered. If the coexistence of two markets should persist, differentiating themselves according to the world’s regions or even by country, it is possible that certain firms will attempt and succeed in rendering volume, diversity, innovation, and flexibility compatible, as General Motors rendered volume and diversity compatible in the 1920s and 1930s. However to achieve this, General Motors was required to invent a new automobile architecture, with commonalized platforms and car models differing on the „surface“, and the construction of new socio-productive principles: polyvalency and supplying. Are modular vehicles more than just a way of outsourcing a maximum quantity of work? Does this also signify a way to design innovative models thanks to different combinations of shared elements? Is there a new opportunity to relaunch the „reflexive production“ with, this time, the search of appropriate employment relationships?

The will to survive is often at an incentive to explore new paths. However, we wish to stress the high level of intelligence and efforts needed to achieving this.

References

Berggren, C. (2000): Volvo: Quel avenir pour l’humanisation du travail? In: Freyssenet, M./Mair, A./Shimizu, K./Volpato, G (dir.): Quel modèle productif? Trajectoires et modèles industriels des constructeurs automobiles mondiaux, paris, La Découverte.

Boyer, R. (ed.) (1988): The Search for labour Market Flexibility, Oxford, Clarendon.

Boyer, R. (1990): The Regulation School: A Critical Introduction, New York, Columbia University Press.

Boyer, R./Saillard, Y. (dir.) (1995): Théorie de la régulation. Etats des savoirs, Paris, La Découverte.

Boyer, R. (1996): The Convergence Hypothesis Revisited: Globalization but Still the Century of Nations? in Berger, S./Dore, R. (eds.): National Diversity and Global Capitalism, Ithaca, Cornell University Press.

Boyer, R./Charron E./Jurgens U./Tolliday S. (eds.) (1998): Between Imitation and Innovation. The Transfer and Hybridization of Productive Models in the International Automobile Industry, Oxford, Oxford University Press.

Boyer, R./Freyssenet, M./Lung, Y. (1999): GERPISA: Erfahrungen aus einem internationalen Automobil-Forschungsnetzwerk. In: Kilper, H./Pries, L. (Hrsg.): Die Globalisierung der deutschen Automobilindustrie. Herausforderungen für Wirtschaft und Politik. Rainer Hampp Verlag, München/Mering.

Boyer, R./Freyssenet, M. (1999) „Rewriting the Future. Profit Strategies, Forms of Internationalisation and New Spaces in the Automobile Industry. In: Eckardt, A./Köhler, H-D./Pries, L. (Hg.): Global Players in Lokalen Bindungen. Unternehmensglobalisierung in soziologischer Perspektive. Edition Sigma, Berlin.

Boyer, R./Freyssenet, M. (2000) Les modèles productifs, La Découverte, Paris.

Boyer, R./Freyssenet, M. (forthcoming): The World that Changed the Machine.

Camuffo, A./Volpato, G., 'Making Manufacturing Lean in The Italian Automobile Industry: the Trajectory of Fiat. In: Freyssenet, M./Mair, A./Shimizu, K./Volpato, G (eds.): One Best Way? Trajectories and Industrial Models of the World's Automobile Producers. Oxford University Press, Oxford.

Cusumano, M. (1985) , The Japanese Automobile Industry. Technology & Management at Nissan & Toyota. Harvard University Press, Cambridge.

Durand, J.P./Stewart, P./Castillo, J.J. (eds.) (1999): Teamwork in the Automobile Industry. Radical Change or Passing Fashion. Macmillan, Basingstoke.

Eckardt, A./Köhler, H-D./Pries, L. (Hg.) (1999): Global Players in Lokalen Bindungen. Unternehmensglobalisierung in soziologischer Perspektive. Edition Sigma, Berlin.

Ellegard, K./Engström, T. et Nilsson, L. (1991): Reforming Industrial Work. Principles and Realities, Stockholm, Arbetsmiljöfonden.

Ellegard, K , (1995): The Creation of a New Production System at the Volvo Automobile Assembly Plant in Uddevalla, Swedan. In: Ake Sandberg (ed.): Enriching Production. Avebury, Aldershot.

Engström, T./Jonsson, D./Medbo, L. (1999): Developments in Assembly System Design: The Volvo Experience' in Lung, Y., Chanaron, J.J./Fujimoto, T./Raff, D. (eds.): Coping with Variety: Product Variety and Production Organization in the World Automobile Industry. Ashgate, Aldershot.

Freyssenet M. (1996): Gruppenarbeit in Frankreich. Der Fall Renault. In: Leo Kissler (Hg.): Toyotismus in Europa. Schlanke Produktion und Gruppenarbeit in der deutschen und französischen Automobilindustrie. Campus Verlag, Frankfurt-New York.

Freyssenet M. (1997): The Current Social Form of Automation and a Conceivable Alternative: French Experience. In: Shimokawa, K./Jurgens, U./Fujimoto, T. (eds): Transforming Automobile Assembly. Experience in Automation and Work Organization, Springer, Berlin.

Freyssenet M. (1998): Reflective production: an alternative to mass-production and to lean production? In: Economic and Industrial Democracy, 19, n°1, february.

Freyssenet, M (1998)., 'Intersecting Trajectories and Model Changes. In: Freyssenet, M./Mair, A./Shimizu, K./Volpato, G (eds.): One Best Way? Trajectories and Industrial Models of the World's Automobile Producers. Oxford University Press, Oxford.

Freyssenet, M. (1999): Competitive Strategies, Industrial Models and Assembly Automation Templates. In: Comacchio, A./Volpato, G./Camuffo, A. (eds): Automation in Automotive Industries. Recents Developments. Springer, Berlin.

Freyssenet, M./Lung, Y. (2000): Between Globalisation and Regionalisation: What is the Future of the Motor Industry. In: Humphrey, J./Lecler, Y./Salerno, M. (eds): Global Strategies and Local Realities: The Auto Industry in Emerging Markets. Macmillan, Basingstoke, and St Martin's Press, New York.

Freyssenet, M./Mair A.(2000): Le modèle industriel inventé par Honda. In: Freyssenet, M./Mair, A./Shimizu, K./Volpato, G. (dir.): Quel modèle productif? Trajectoires et modèles industriels des constructeurs automobiles mondiaux. La Découverte, Paris.

Fujimoto, T., (1999): The Evolution of a Manufacturing System at Toyota. Oxford University Press, Oxford.

Gerst, D./Hardwig, T./Kulmann M./Schuman, M. (1999): Group Work in the Geramn Automobile Industry: The Case of Marcedes-Benz. In: Durand, J.P./Stewart, P./Castillo, J.J. (eds.): Teamwork in the Automobile Industry. Radical Change or Passing Fashion. Macmillan, Basingstoke.

Humphrey, J./Lecler, Y./Salerno, M. (eds) (2000): Global Strategies and Local Realities: The Auto industry in Emerging Markets. Macmillan, Basingstoke, and St Martin's Press,New York.

Hounshell D.A. (1984): From the American system to mass production, The Developement of Manufacturing Technology in the United States, 1800-1932. Johns Hopkins University Press, Baltimore.

Jürgens, U. (1989): Modern Zeiten in der Automobilfabrik. Berlin, Springer.

Jürgens, U. (1998): The development of Volkswagen's Industrial Model, 1967-1995). In: Freyssenet, M./Mair, A./Shimizu, K./Volpato, G (eds.): One Best Way? Trajectories and Industrial Models of the World's Automobile Producers. Oxford University Press, Oxford.

Jürgens, U, (ed.) (2000): Nex Product Developement and Production Networks. Springer, Berlin.

Kuhn, A.J. (1986): GM Passes Ford: 1918-1938. The Pennsylvania State University Press.

Laux, J.(1977): Genèse d'une révolution. In: Bardou, J. P. et al: La révolution automobile. Albin Michel, Paris.

Lewchuk, W. (1989): Fordism and the Moving Assembly Line. The British and American Experience. In: Lichtenstein, N./Meyer, S.: On the Line. Essays in the History of Auto Work. University of Illinois Press, Chicago,.

Lung, Y./Chanaron, J.J./Fujimoto, T./Raff, D. (eds.): Coping with Variety: Product Variety and Production Organization in the World Automobile Industry. Ashgate, Aldershot, 2000.

Mair, A., (1994): Honda's Global Local Corporation. Macmillan, Houndmills.

Nelson, D., (1980): Frederick W. Taylor, The Rise of Scientific Management. The University of Wisconsin Press, Madison.

Nilsson, L. (1995): The Uddevalla Plant: Why did it Succeed Withe a Holistic Approach and Why did it Come to an End? In: Ake Sandberg (ed.): Enriching Production. Avebury, Aldershot.

Raff, D., (1998): Models, Trajectories, and the Evolution of Production Systems: Lessons fron the American Automobile Industry in the Years between the Wars' in Freyssenet, M./Mair, A./Shimizu, K./Volpato, G (eds.): One Best Way? Trajectories and Industrial Models of the World's Automobile Producers. Oxford University Press, Oxford.

Raff, D. (1999): G.M. and the Evolving Industrial Organisation of American Automobile Manufacturing in the Interwar Years. In: Lung, Y./Chanaron, J.J./Fujimoto, T./Raff, D. (eds.): Coping With Variety. Flexible Productive Systems for Product Variety in the Auto Industry. Londres, Ashgate.

Sloan, A. P., (1963): My Years with General Motors. New York, Doubleday and Currency.

Shimizu, K., (1999): Le Toyotisme, Paris, Repères, La Découverte.

Shimokawa, K. (1994): The Japanese Automobile Industry, A Business Historyustry, Londres, The Athlone Press.

Shimokawa, S./Jurgens, U./Fujimoto, T./(1997): Transforming Automobile Industry. Experience in Automation and Work Organisation. Berlin, Springer

Tolliday, S. (1998): The Diffusion and Transformation of Fordism: Britain and Japan Compared. In: Boyer R./Charron E./Jurgens U. et Tolliday S (eds). Between Imitation and Innovation.

The Transfer and Hybridization of Productive Models in the International Automobile Industry. Oxford, Oxford University Press.

Volpato G.(1983): L'industria automobilistica internazionale. Padova, Cedam.

Womack, J./Jones D./Roos, D. (1990): The Machine that changed the World, New York, Macmillan.

Woollard, F. (1924): Some Notes on British Methods of Continuous Production: In: Proceedings of the Institution of Automobile Ingineers, 19.

Zeitlin, J./Herrigel, G. (eds.) (2000): Americanization and its Limits. Reworking US Technology and Management in Post-War Europe and Japan, Oxford, Oxford University Press.