

The 24th GERPISA International Colloquium
The “new frontiers” of the world automotive industry. Technologies, applications, innovations, markets
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The Productive Models Theory

Developments and perspectives

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Introduction

**Is the analysis framework,
proposed in *The Productive Models*
still relevant ?**

**Lean production has not changed the world...
but the world has changed the car industry**

Synopsis of the presentation

- I. *The productive models* in two sentences...
- II. How was the schema elaborated? What can it be developed ?
- III. What are the changes that it allowed to better understand ?
- IV. How could it be useful for analyse China and the future of car industry ?

I. *Productive Models* in two sentences... and four main concepts

Firms develop different **profit strategies**, by privileging one or two profit sources

There are two main conditions for sustainable firms profitability:

- relevance of profit strategy in the **national growth mode**,
- consistency of the **productive model**, built to implement the profit strategy, thanks to a **company governance compromise**

The productive models. The conditions of profitability

Palgrave, 2002

II. At the origin of analytical framework : **four surprising facts**

- 1. A carmaker can be profitable with a low productivity, and vice versa**
- 2. The constantly profitable carmakers did not choose the same sources of profit**
- 3. A carmaker with a clear profit strategy can be profitable in a country, and not in another**
- 4. A carmaker with a relevant profit strategy in a country could be however unprofitable**

1. Which carmakers were profitable, and during how many years ?

1. Productivity is not linked to profitability.

Profitability is the basic stake for a firm managed in capitalist conditions

2. During 1975-1994 period, only three carmakers were constantly profitable : Toyota, Honda, VW

3. During 1995-2014 period, only four : VW, Honda, BMW, Hyundai-Kia

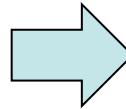
2. What is the origin of their profitability?

- 1. Carmakers did not give priority to the same sources of profit**
- 2. Revisiting all the history of automobile industry and calculations on 1965-1994 period allow to identify**
 - six profit sources, and**
 - six profit strategies, privileging one or two profit sources**

Different ways to make profits

The profit sources

- economies of scale
- diversity of products
- product quality
- commercially relevant innovation
- productive flexibility
- reduction in costs at constant volume



The profit strategies

- ‘quality’
- ‘diversity and flexibility’
- ‘volume’
- ‘volume and diversity’
- ‘permanent reduction in costs at constant volume’
- ‘innovation and flexibility’

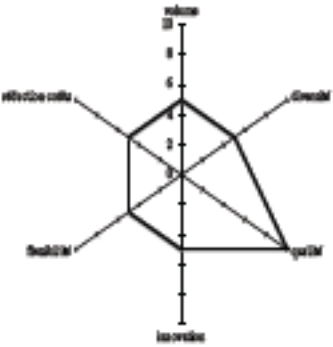
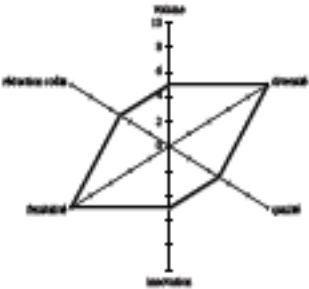
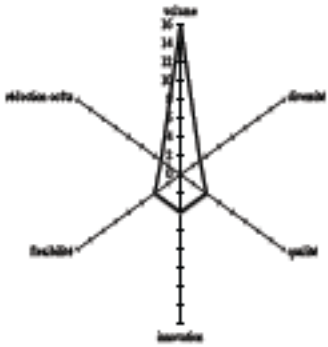
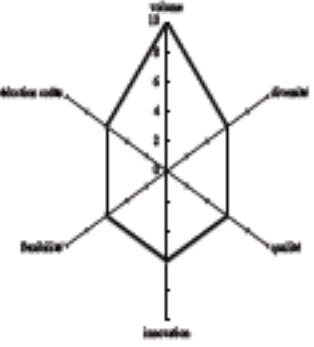
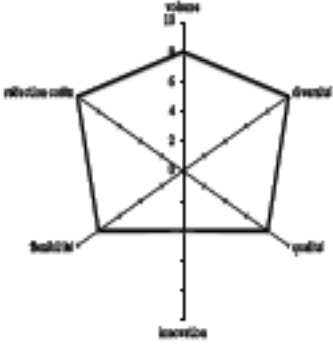
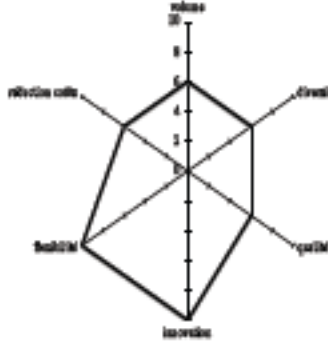
Nothing else?

1. The sources of profit are **different ways to obtain a surplus from labour**, that is to say to make profit in capitalist conditions
2. A source of profit cannot be considered as such, if it is not **totally independent from other sources**,

as for example financial profits and extra profits

Profiles of profit strategies

(the proportions in which the profit sources are exploited)

Quality	Diversity and flexibility	Volume
<p data-bbox="278 462 394 482">Stratégie "qualité"</p> 	<p data-bbox="838 462 1031 482">Stratégie "diversité et flexibilité"</p> 	<p data-bbox="1514 462 1630 482">Stratégie "volume"</p> 
Volume and diversity	Permanent costs reduction at cst volume	Innovation and flexibility
<p data-bbox="220 948 413 968">Stratégie "volume et diversité"</p> 	<p data-bbox="761 948 1147 968">Stratégie "réduction permanente des coûts à volume constant"</p> 	<p data-bbox="1476 948 1688 968">Stratégie "innovation et flexibilité"</p> 

Strategies	Automobile producers	Period
Volume	Ford	1909-1957
	Volkswagen	1949-1974
	Renault	1949-1955
	Fiat	
Volume and diversity	General-Motors	1926-20...
	Ford	1967-20...
	Renault	1954-1996
	Fiat	1950-20...
	Volkswagen	1975-20...
	Hyundai-Kia	1994-20...
Quality	Mercedes	1949-20...
	BMW	1953-20...
	Porsche	1950-20...
	Volvo	1960-20...
Diversity and flexibility	Austin	Inter-war period 1945-55
	Morris	
	Renault	
	Peugeot	
	Toyota	
	Nissan	
Permanent costs reduction at constant volume	PSA	1945-1976
	Toyota	1950-20...
Innovation and flexibility	Chrysler	1924-1945
	Chrysler	1984-95
	Citroën	1949-1960
	Honda	1968-20...

The ranking of carmakers
by profit strategy ...
and by hesitating strategy

Hesitating strategy	Automobile producers	Period
Volume or volume-diversity	Ford	1957-1967
Volume-diversity or innovation-flexibility	PSA	1976-1990
	Renault Mitsubishi	1997-20... 1960-20...
Diversity-flexibility or volume-diversity	Nissan BLMC-Rover	1956-1998 1968-1994
Diversity-flexibility or volume	Renault	1949-1955
	Fiat	1949-1955

3. What is necessary and sufficient for a profit strategy could be relevant ?

1. The conditions of possibility of each profit strategy:
necessary volume and structure of **automobile demand**
and of **labour to mobilize**
2. The types of national demand and of labour are different, because they are engendered by also different national growth modes
3. The national growth modes are different by
 - their **growth engine**: investments, consumption or exports
 - their **income distribution mode**: competitive, moderately hierarchized, unequal or restrictive

Profit strategy	Characteristics	Conditions of relevancy		Implementation requirements			Company governance compromise
		Market	Labour	Product policy	Productive org.	Employment relation.	
Diversity and flexibility	Profit margins based on - products that specifically respond to distinct types of demand - rapid adjustment of costs to variations in demand	- heterogeneous, even balkanised - from variable to unstable	- autonomous, flexible and mobile workforce	- models with few parts in common - targeting different customer categories - price that is most lucrative	- design new models rapidly and for lowest cost - production changed whenever necessary	- remuneration of competency and flexibility - incentives so work is carried out within competitive timeframe	- to be developed by shareholders seeking remuneration, employees and suppliers who ought to be flexible and efficient
Quality	Profit margins based on - products socially considered to be « top-of-the-range » or luxury goods - commercial distribution is international from the beginning	- well-to-do and affluent clientele - international	- skilled, working under constraint of having to maintain specialisation on international markets of national production	- offering models that express the social and economic position of a well-to-do and affluent clientele	- guaranteeing quality of supplies, maintaining quality throughout production process - ability to sell prestige factor	- maintaining the rare competencies that guarantee quality and prestige - emphasis on professionalism and on good work	- developed by owners concerned with the brand, by wage-earning professionals and by suppliers responsible for quality
Volume	- Economies of scale through production of increasing quantities of standard model	- homogeneous - rising - national, then international	- abundant, unskilled and unionised workforce	- offering a product that satisfies basic individual transport needs	- standardisation and fluidification of production	- get people to accept undifferentiated work and repetition of identical acts	- to be developed primarily by executives together with most employees
Volume and diversity	- Combination of economies of scale for non-visible elements and economies of scope for visible elements	- moderately hierarchised, with transition from one segment to another over product life - national then international	- polyvalent and unionised workforce	- offering superficially different models with shared platforms - excluding niche vehicles, at the very bottom and top-of-range	- control the complexification variety creates in all domains - avoid simultaneous overcapacities or undercapacities	- achieve polyvalency - offering of moderately hierarchised wages - guarantee career development opportunities	- mainly developed by managers together with growing number of engineers and technicians, and with labour unions
Innovation and flexibility	- Profit margins based on innovative models that are a response to new expectations - Innovation rent exploited through saturation of potential demand before it is copied - Losses limited through rapid reconversion in case of failure	- partially rejuvenated by the periodically emerging practical and symbolic expectations of new sections within the general population	- entrepreneurial and opportunistic employees	- offering when needed conceptually innovative models that correspond to expectations of those the durable new sections of the population	- generate ability to innovate in a commercially relevant manner - develop highly responsive organisation in all areas	- emphasis on innovation, expertise and responsiveness	- become financially autonomous so as to be able to assume the necessary risks - pact between executives, innovators and responsive employees
Permanent reduction in costs	- Constant volumes, costs cut in all circumstances - Other profit sources are exploited as long as they do not undermine the cost-cutting	- moderately hierarchised - emphasis on price, reliability and raising level of basic	- semi-skilled and unionised employees - operating under external competitiveness	- strict volume, diversity and quality of product offer - avoid having to innovate	- avoid major variations in production - design a productive organisation that can	- get employees to accept cost-cutting as well as its effects on jobs and on work	- mainly developed by executives, employees and suppliers - ensure that this is politically acceptable in light of the

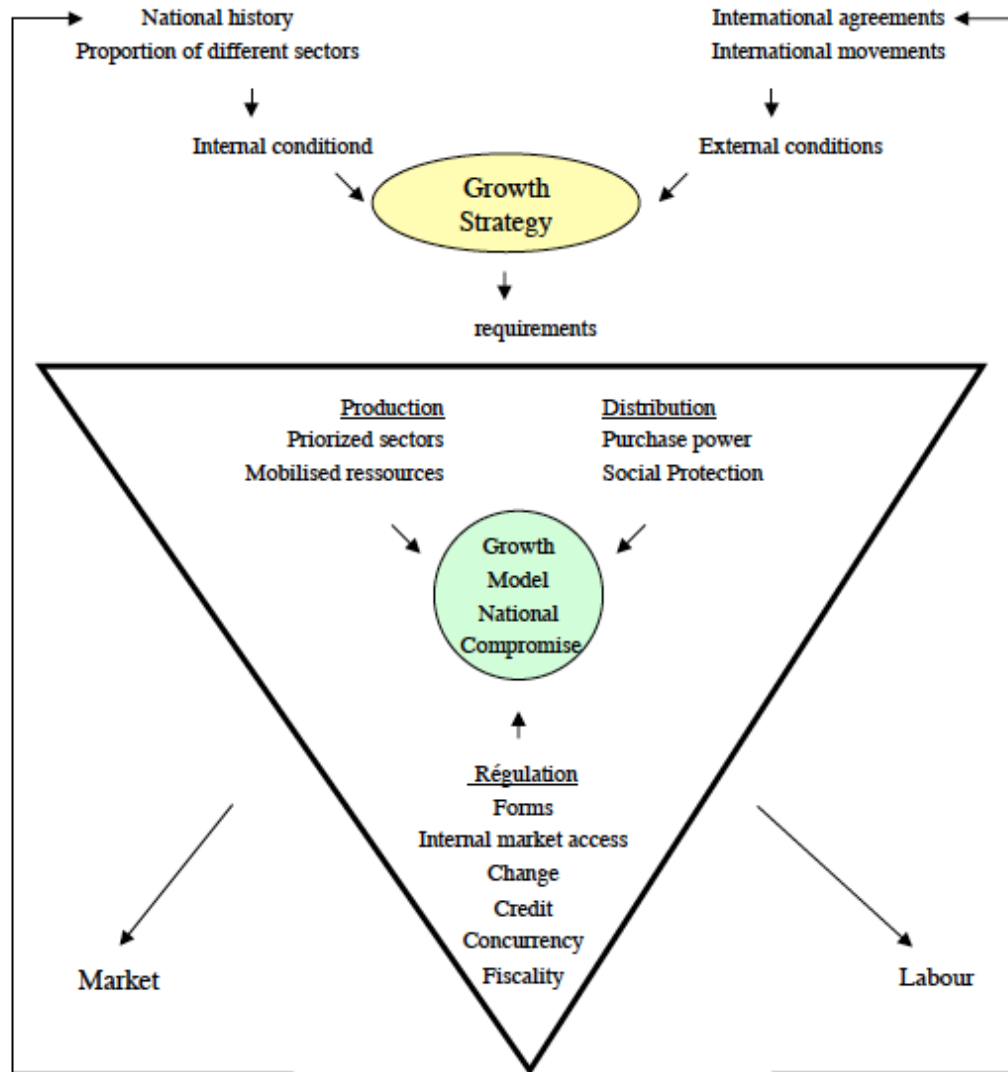
Favoured profit strategies according to national growth modes

Modes	National income		market	labour	Countries	Favoured profit strategies, in descending order
	distribution	growth				
« competitive and competed »	- depends on local and category-specific balance of power and on financial opportunism	- variable depending on firms' domestic and external competitiveness	- balkanised - unstable - some categories are excluded	- flexible - organises itself on a professional basis	United Kingdom	1. Diversity-flexibility 2. quality
« competitive and consumer-oriented »		- Consumption-driven	- heterogeneous - variable	- flexible - organises itself into branch-wide labour unions	USA 1910-35, 1990-20...	1. Innovation-flexibility 2. Volume-diversity
« competitive and price export-oriented »		- driven by export of competitive standard products	- heterogeneous - unstable - some categories are excluded	- abundant - poorly organised	Republic of Korea, 1980-20... Spain, 2005-20... Central Europe, 1995-20...	1. volume-diversity 2. permanent cost reduction at constant volume
« co-ordinated and consumer-oriented »	- nationally co-ordinated, moderately hierarchized, geared to productivity	- consumption-driven	- mass-oriented - moderately hierarchized - foreseeable	- organised into unions - makes demands	USA 1935-80 France, 1954-20... Italy 1955-20... Spain 1985-2005	1. Volume-diversity 2. Innovation-flexibility
« co-ordinated and specialised export-oriented »	- nationally co-ordinated, moderately hierarchized, geared to export competitiveness	- driven by export of specialised goods or services	- mass-oriented - moderately hierarchized - significant top-of-the-range	- organised into unions - cooperative - stable	Germany 1950-20... Sweden 1955-20...	1. Volume-diversity 2. Quality
« co-ordinated and price export-oriented »		- driven by export of competitive mundane products	- mass-oriented - moderately hierarchized - foreseeable	- organised into unions - cooperative - stable	Japan 1955-20...	1. permanent costs reduction at constant volume 2. Volume and diversity
« Inegalitarian and rent-oriented »	- structurally inegalitarian - vote-catching	- erratic, depends on world prices for raw goods and agricultural products	- categories of owners, executives and dependents - sudden contraction or expansion	- flexible - poorly organised - dependent	Brazil Mexique	1. quality 2. Volume-diversity
« shortage and investments-oriented »	- relatively egalitarian for most of the population	- depends on savings rate	- very limited - administered - foreseeable	- mobilised	SSRU 1930-1990 Europe	1. volume 2. quality

Are determinants of demand and of labour limited to national growth mode ?

1. Many others determinants to take in account:
households but also enterprises, used cars, alternatives to cars, urbanisation, demographics, numerous public policies and stakeholders confrontation...
2. They modulate the demand and the labour generated by national growth mode
3. They correspond to compromises at national and sectorial levels
4. It is possible taking into account them, by distinguishing national **growth strategy** and national **growth model**, based on national and sectorial compromises to regulate production and distribution of national income

STRATEGY AND MODEL OF GROWTH



Dynamics- contradictions

4. What is necessary to implement a profit strategy?

1. Build a company government compromise to find out **product policy, productive organisation and employment relation**, that respond coherently to the requirements of the profit strategy
2. Six identified productive models, that implement the six profit strategies :
 - Taylorian model and Woollardian model for diversity-flexibility strategy
 - Fordian model for volume strategy
 - Sloanian model for volume-diversity strategy
 - Toyotian model for permanent cost reduction at constant volume strategy
 - Hondian model for innovation-flexibility strategy

Models	Profit strategy being implemented	Company governance compromise	Components of the model			Dynamics Risks Contradictions
			Product policy	Productive organisation	Employment relationship	
Taylorian	Diversity and flexibility	"High wages, inexpensive workforce" « scientific » methods	Specific products, varied product offer, medium-sized series	Standard procedures and allocated times, flexibility of equipment and stationary individual workstations	Task-based wages, augmented by 30 to 100% if procedures followed and deadlines met	Conditional increases in productivity
Woollardian	Diversity and flexibility	Autonomy and collective skills, flexibility, capital is well remunerated	Specific products, varied product offer, small & medium-sized series, lucrative price	Workshops for each product or subsystem, mechanisation and synchronisation of supplies	Autonomous teams, Incentivising piecework wages negotiated on a team-by-team basis	Establishment of a « dual » management structure in the firm
Fordian	Volume	Access to mass consumption vs. acceptance of productive organisation	Standard single produit, drop in real prices	Production is integrated, continuous, mechanised, timed and broken down into elementary operations	Rising fixed wages, egalitarian, vs. parcellised and repetitive work	Rapid saturation of market, emergence of labour unions making demands
Sloanian	Volume and diversity	Rising purchasing power vs. rising productivity	Hierarchised product range, shared platforms, superficial diversity, many options	Strategic centralisation and operational decentralisation, tools are polyvalent and subcontracting	Wages depend on job being done, polyvalency vs. acceptance of the organisation	Management structure is weighed down, excessive diversity, cannibalisation of products
Toyotian	Permanent reduction of costs at constant volumes	Longevity for firm and for employees' and suppliers' jobs	Well-equipped basic models, good quality that is perceptible to the client	Polyvalent work team, « Just-in-Time » inside and outside of firm	Employment and career guarantee vs. collective participation in reduction of standard times	Limits of social and political acceptability, severe competition in certain situations
Hondian	Innovation and flexibility	Self-funded, individual promotion vs. responsiveness and initiative	Conceptually innovative and specific models, anticipation of customer expectations	Lines, machines and personnel can be quickly converted	Hiring, wages and promotions depend on initiative, expertise and responsiveness	Loss of innovation rent because product is copied rapidly, loss of autonomy

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methodological remarks...

Investigating the requirements of the chosen profit strategy, presents two advantages :

- 1. We can know, among the numerous features of a firm, which are essentials. We can avoid low rigorous approaches, as “tinkered modelling” and “statistical constellations calculating”**
- 2. we can classify the socio-productive configurations of firms depending on they meet or not the requirements of the strategies pursued**

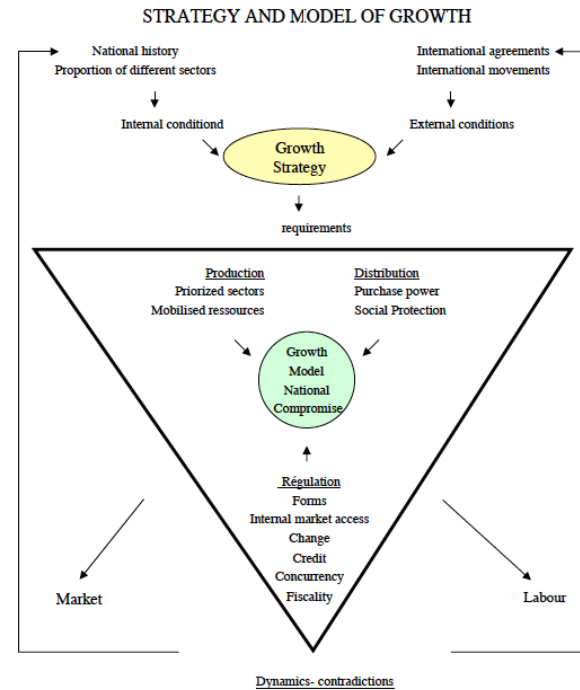
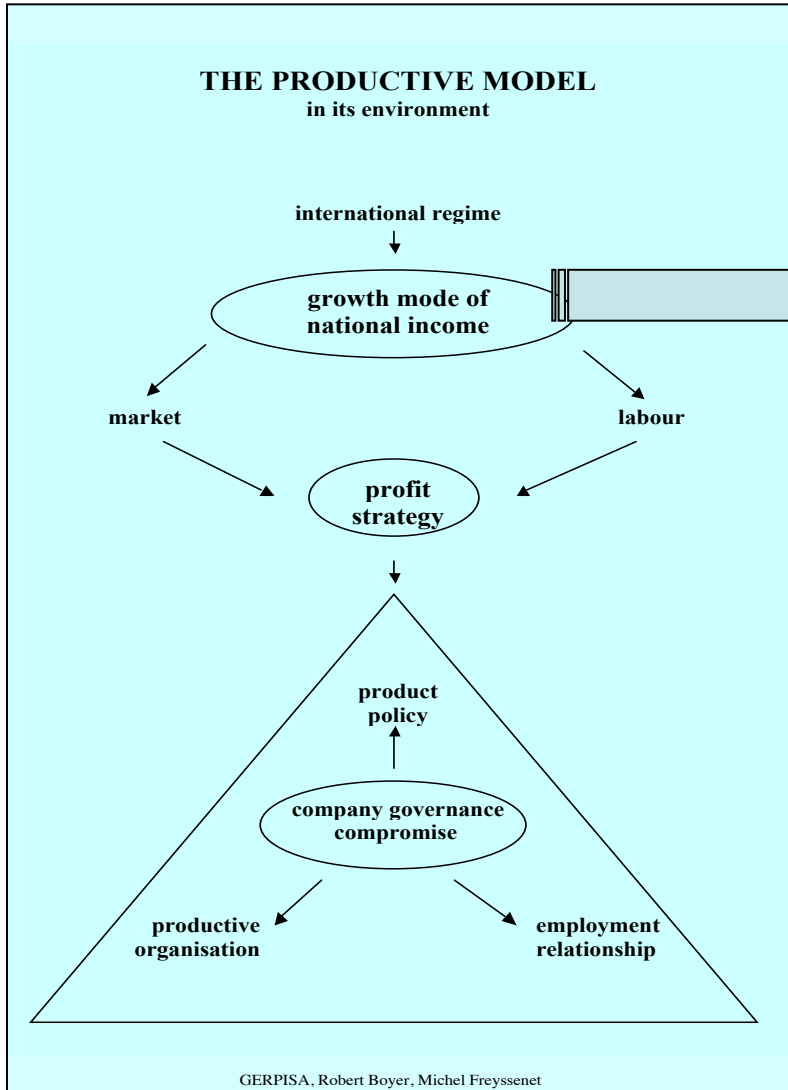
Two developments for productive model concept

1. Establish the means used for product policy, productive organisation and employment relationship by each productive model, and say they are the result of a compromise at company level is not enough.

We have to reconstitute their genesis, specially since the national and sectorial levels. **A good way to do that is to distinguish the national growth strategy and model**

2. For this reason, an internationalized carmaker must build other compromises in each country where it is industrially and commercially present, to implement its profit strategy.

So we must probably abandon the **appellations too general** that we used to name the productive model of some carmakers: as taylorian, fordian, ...



**A new
representation of
engendering of
productive models**

Five tools to analyse firm trajectories and countries

What are the profit strategies of carmakers ?

1. **Profit strategies**: characteristics, conditions of relevancy to market and to labour, requirements of implementing
2. **Ranking of carmakers** by profit strategy and period

Where and when their profit strategies are relevant ?

3. **National growth strategy and model**: growth engine, income distribution mode, type of demand, type of labour, ranking of countries, favoured strategies

What productive models have implemented efficiently their profit strategy ?

4. **Productive models**: implemented profit strategy, company governance compromise, product policy, productive organisation, employment relationship, dynamics and contradictions

A synthetic representation of engendering of productive models

5. **The new extended representation**

How to use these tools?

- 1. The tables indicate the characteristics to fulfil,**
 - by a carmaker to know its profit strategy and its productive model**
 - by a country to know its growth strategy and model, and the type of car demand and of labour it offers**

- 2. From these tables, compare the reality of each carmaker , and evaluate the degree of relevancy of its profit strategy, and of coherence of its socio-productive configuration. Ditto for each country.**
 - to better understand the variable results of carmakers and countries, and more generally their trajectories**
 - to identify eventually new strategies and productive models**
 - to improve the tools**

III. What are the changes that the analytical schema allowed to better understand ?

1. **A sixth tool** : Compatibility of some “tendencies” with profit strategies
2. **Changes and « tendencies » analysed since 15 years with the tool** : mega-mergers, modularization, product architecture, « new economy », bankruptcy of Big Three and of PSA, globalization, regionalization, outsourcing, externalization, country attractiveness, relocation, suppliers parks, automation, work conditions, foreign subsidiaries, evolution of car demand, divergent trajectories of « emergent countries », work crisis at Toyota, transition to clean car, etc.
3. Only two changes will be analysed here : **mega mergers** and **transition to clean car**

A tool to assess the relevancy of a “trend” for profit strategies

Profit strategies	Offering all types of vehicles	Shared platforms	Externalisation	Modularisation	Clean engine	Internationalisation	Merger-acquisition-alliance	Development of customer services	Reliance on financial markets
Quality	No, only in the upper segments of the traditional product range	No, there is an absolute need for 'distinction', including in the non-visible aspects	Maintain the know-how that gives the project its image of 'social quality'	No, commercial need for a highly integrated product	Yes, but not before finding a reliable and lasting solution	Indispensable, but only at a commercial level, production in the country of origin	Incompatibility with firms pursuing very different profit strategies	Yes, part of indispensable and highly customised service	Possible, if investors are seeking safety
Diversity and flexibility	Yes, possible, but not indispensable	No, the demand is too 'balkanised'	Yes, to have the necessary flexibility	Yes, possible for certain customer bases	Yes, for certain customer bases	Not necessary, possible in countries with a competitive income distribution	Possible with a firm pursuing the same strategy but not indispensable	Yes, this is a condition for capturing certain customer bases	Yes, possibility of high albeit variable returns
Volume	No, only models in the main market segments	No, standard and 'integrated' model	No, need for continuous flows	No, insufficient diversity	Yes, when there is a possibility to synthesize innovations and rapid price reductions	Indispensable, if national market is saturated, move towards countries with coordinated and egalitarian distribution	Very profitable if there is a possibility of adopting the same models	Standard service, minimum indispensable	No, resistance to lower prices in case of strong demand
Volume and diversity	No, only models whose platforms can be shared	Indispensable, diversity on 'surface' level	Yes, but by maintaining control over volumes and prices	Yes, in the form of sub-assemblies for the moment, and if externalisation conditions are fulfilled	No, but very rapid copying, if there is sufficient demand and economies of scale are possible	Indispensable, if the national market is saturated in countries with a moderately hierarchised distribution	Vital where a second stage renewal market is involved; absolute need for shared platforms	Yes, when economies of scale can no longer be achieved with material products	Yes, if stable returns are expected over the long run
Permanent reduction in costs	No, only models for which demand can be forecast relatively easily	Yes, if the demand is moderately hierarchised	Yes, but by maintaining technical control and if there is the same profit strategy and productive model	Yes, carefully, in the form of sub-assemblies, and if externalisation conditions are fulfilled	No, but quick copies becomes the new norm	Very profitable if possible, move towards countries with predictable demand and stable exchange rate, but not indispensable	Not advisable, since it is hard to find a firm with the same strategy and company government compromise	Yes, to ensure customer loyalty	No, too costly, need for self-funding
Innovation and flexibility	No, only conceptually innovative models	Difficult, when the aim is to respond to new expectations	Indispensable for rapid mass production if successful, or for the model's withdrawal in case of failure	Yes, but only for research and innovative models	Yes, at each stage of innovation	Not necessary if located in a region marked by competitive distribution, indispensable elsewhere	Not necessary, possible with firm pursuing the same strategy	No, unless it constitutes an innovative concept	No, risk of losing financial independence, indispensable for innovation

Boyer R., Freyssenet M., The Productive Models Theory. Developments and perspectives, Slides presentation. The 24th GERPISA International Colloquium "The "new frontiers" of the world automotive industry" Puebla, Mexico, 1, 2, 3 June 2016, 28 slides. Electronic Publishing: freyssenet.com, 2016., ISSN 1776-0941.

Compatibility or incompatibility of profit strategies, when carmakers merge, and the results

1. **Incompatibility : failure**

BMW-Rover, Daimler-Chrysler-Mitsubishi, Ford-Mazda-Volvo,
and may be, in the next future, Fiat-Chrysler ?

2. **Compatibility, but divergence to implement the strategy: failure**

GM-Fiat, GM-PSA

3. **Compatibility by imposition of one strategy: success**

VW-Audi-Skoda-Seat, Hyundai-Kia

4. **Necessity to clarify the profit strategies**

Condition for deepening of Renault-Nissan Alliance

5. **No necessity and risks to merge:**

Honda, Toyota

Has a second automobile revolution begun?

1. How to make an useful analysis ?

2. Four conditions for a « technological revolution »

- crisis of the previous system

- convergence of innovations, mainly coming from other sectors, for different solutions

- formation and confrontation of coalitions of actors supporting different solutions and different scenarios of transition

- prevalence of one scenario and generalisation, thanks to societal decisions

3. The current scenarios: diversity, progressiveness, rupture, and the preferences of carmakers according to their profit strategy

4. A geo-political prognosis

Conclusive remarks of first three parts of communication

1. A **reconstitution ex-post** of the developed approach
2. **Some compasses** :
 - Start the questioning from the basic stake of actors : in our case, profitability
 - Reasoning by difference and not by tendency
 - Researching always the condition of possibility and viability to any phenomenon
 - Refusing any disciplinary limitation or pre-supposition to investigate
3. **A theory is only a tool**, and as all tool, it is necessary to learn to use it. It is the reason, we have insisted on the approach
4. **The China case analysis** is now presented to illustrate this approach at the beginning of a research