FEAUSP

EAD 5977 – New trends in products, processes, technologies and transitions in automotive Industry

PRO

Global value chain in the automotive industry: challenges and new trends

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Consiglio Nazionale delle Ricerche
IRCrES
ISTITUTO di RICERCA sulla CRESCITA ECONOMICA SOSTENIBILE
RESEARCH INSTITUTE on SUSTAINABLE ECONOMIC GROWTH

AGENDA

- **Clarifying global value chain (GVC) concepts**
- Some peculiarities of the automotive global value chain
- The dimensions of the global value chains
  - Global context
    - Input-output structure
    - Geographic Scope
    - Governance Structure
  - Local context
    - Local Institutional Context
    - Industry Stakeholders
    - Upgrading Trajectories
- The future of global value chains
- The future of the automotive global value chain

WHAT GLOBAL VALUE CHAINS (GVC) ARE

➔ CHAIN

- The full range of activities that firms and workers do to bring a product from its conception to its end use" (Gereffi and Fernandez-Stark, 2011).

➔ VALUE CHAIN

- The value categorizes the generic value-adding activities of an organization. Value added describes the enhancement a company gives its product or service before offering the product to customers (Porter, 1985).

➔ GLOBAL VALUE CHAIN ?

- The fact that value chains are increasingly spread over several countries explains why they are regarded as "global" due to the rise of intermediate goods trade (import content of exports): 20 in 1990; 40 in 2010; 60 in 2030 (P. Lamy, WTO)

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➔ VALUE

- The va… n organi… pany gives its pro… rs (Porter, 1985).

GVC= Value divided among different firms and spread over the globe.

The value can be contained within a single firm or divided among different firms. Can be contained within a single geographical location or divided among different firms spread over the globe.

➔ GLOBA

- The fa… l countries explai… intermediate goods trade (import content of exports): 20 in 1990; 40 in 2010; 60 in 2030 (P. Lamy, WTO)

THE ECONOMIC FORCES THAT GOVERN GVC

- The ICT revolution made it possible to coordinate complexity at distance
- ICT impacts on the **functional unbundling** of production processes by the trade-off between specialization and coordination costs
  - Better coordination technology reduces the cost of specialization and thus fosters functional unbundling
  - Better information technology reduces the benefits of specialization and thus disfavours functional unbundling

THE ECONOMIC FORCES THAT GOVERN GVC

- Direct costs differences (e.g. wages) and the reduction of separation costs (e. g. trade barriers, transportation) made separation profitable
- The **geographical unbundling** of stages of production is governed by a balance between dispersion forces and agglomeration forces.
  - Agglomeration forces create attraction to clusters that discourages offshoring
    - Knowledge spillovers favours co-location with customers and intermediate good supplies
  - The dispersion forces that encourage geographic unbundling include
    - Wage gaps (fostering North-South offshoring)
    - Firm-level excellence (fostering North-North and South-South offshoring).

EVOLUTION OF GLOBAL VALUE CHAIN

1977	1985	1994	2000	2007
Commodity chains	**Porter's value chain**	**Global commodity chain**	**Global value chain**	**Global value network**
The basic idea was to trace all the sets of inputs and transformations that lead to an "ultimate consumable".	A value chain is a set of activities that a firm operating in a specific industry performs in order to deliver a valuable or for the market.	The concept of "global commodity chain" was later introduced for describing the apparel commodity chain spread across the globe. In the 2000s.	The shift is combining the analysis of trade and industrial organization as a value-added chain.	A more recent strand of research prefers to put the emphasis on the concept of "network" rather than "chain" because businesses are more interconnected.

YOU CAN CONFUSE GVC WITH

- **Global Supply Chains**
  - The distribution of goods and services to reduce time and costs by trade facilitation (Manufacturing and distribution steps are emphasized)
- **Filiere** (Commodity chains)
  - It is a process used by firms to gather resources, transform them into goods or commodities, and finally, distribute them to consumers
- **Industrial districts**
  - They are characterized by groups of co-located small- and medium-sized companies operating in light manufacturing sectors of the economy. There are not a few large companies within the region. Instead, the dense network gives the regional economy its character.
- **Industrial clusters**
  - They encompassing many possible configurations of companies and institutions so that industrial districts are one type of a cluster.

WHY FOCUSING ON GVC?

- Able to capturing several new characteristics of the world economy
  - The increasing fragmentation of production across countries
  - The specialization of countries in tasks and business functions rather than specific products
  - The creation, capture and sustain domestic value added (e.g., Chinese i-Phone example; build capabilities of domestic suppliers)
  - The role of networks, global buyers and global suppliers
    - **Regional Value Chains**
      Growing in importance, esp. since 2008-09 and in emerging economies; beyond fragmentation and EOI (Export Oriented Industrialization) development model.
    - **Global value network**
      Value networks differ from value chains in that there are more actors carrying out a broader variety of functions in a value network than in a value chain, where producer consumer distributor relationships predominate.

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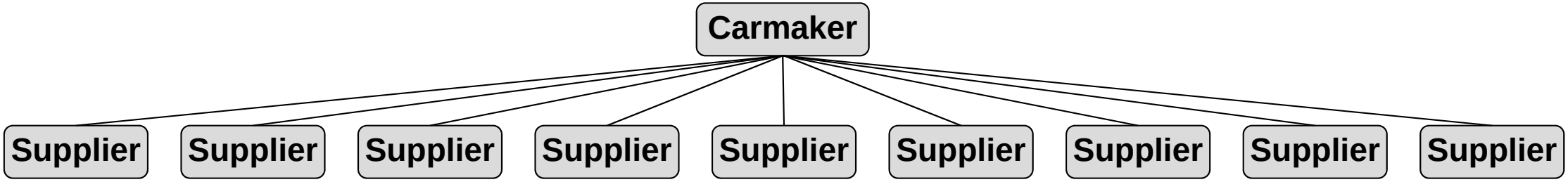
SOME PECULIARITIES OF THE AUTOMOTIVE GLOBAL VALUE CHAIN

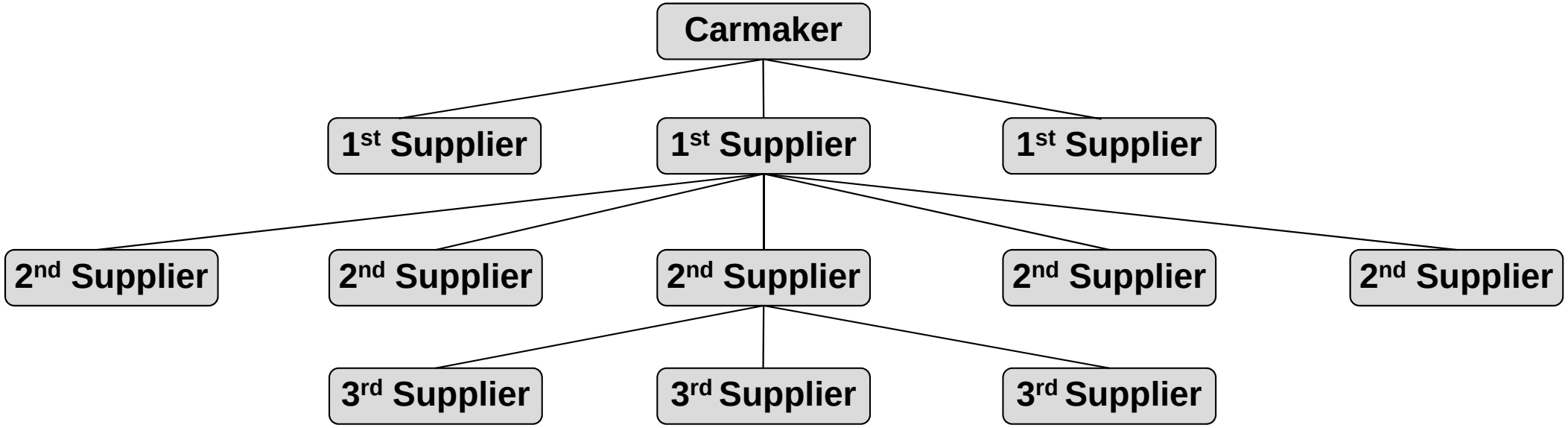
1) An extremely concentrated firm structure: a small number of giant companies (carmakers and global suppliers) exert an extraordinary amount of power over a pyramid structure of smaller firms.

FROM FLAT HIERARCHY TO PYRAMID HIERARCHY

FLAT HIERARCHY



PYRAMID HIERARCHY



FROM FLAT HIERARCHY TO PYRAMID HIERARCHY

	FLAT HIERARCHY	PYRAMID HIERARCHY
Period	2nd Industrial revolution	'80 Japan '90 USA - EU
Number of direct suppliers	Many	Few
Role of suppliers	Low	High
Co-design	Low	High
Contract length	Short	Long
Cross holdings	Rare	Prevailing
Relationship	Divide and rule	Lean manufacturing Partnership

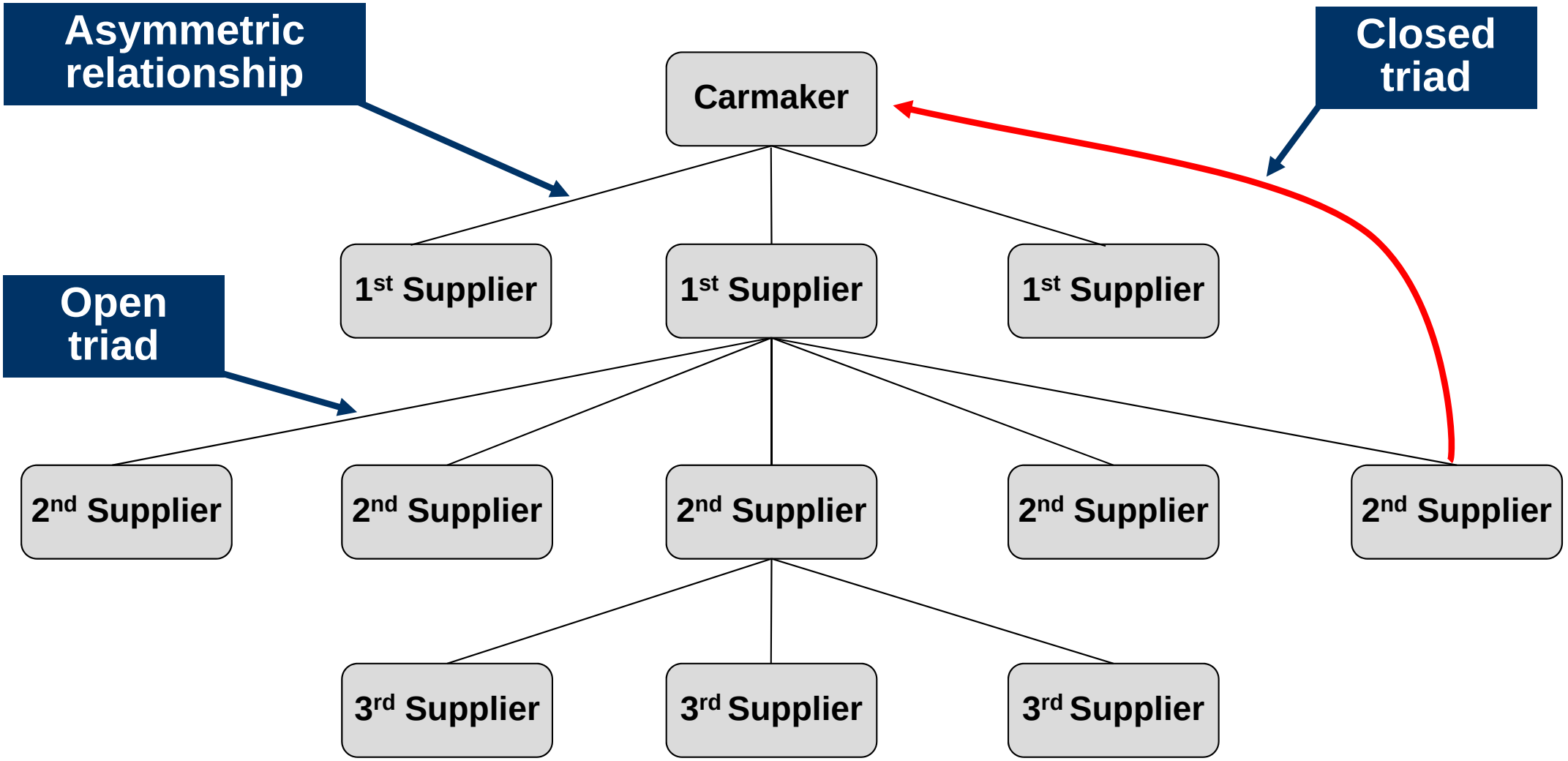
Number of direct suppliers		
GOLF 5 2003	**GOLF 6 2008**	**GOLF 7 2012**
306	206	163

Vertical production disintegration in FIAT*			
UNO 1983	**PUNTO 1993**	**STILO 2001**	**500X 2014**
50%	65%	70%	75%

Vertical engineering disintegration in FIAT*			
UNO 1983	**PUNTO 1993**	**STILO 2001**	**500X 2014**
30%	45%	70%	60%

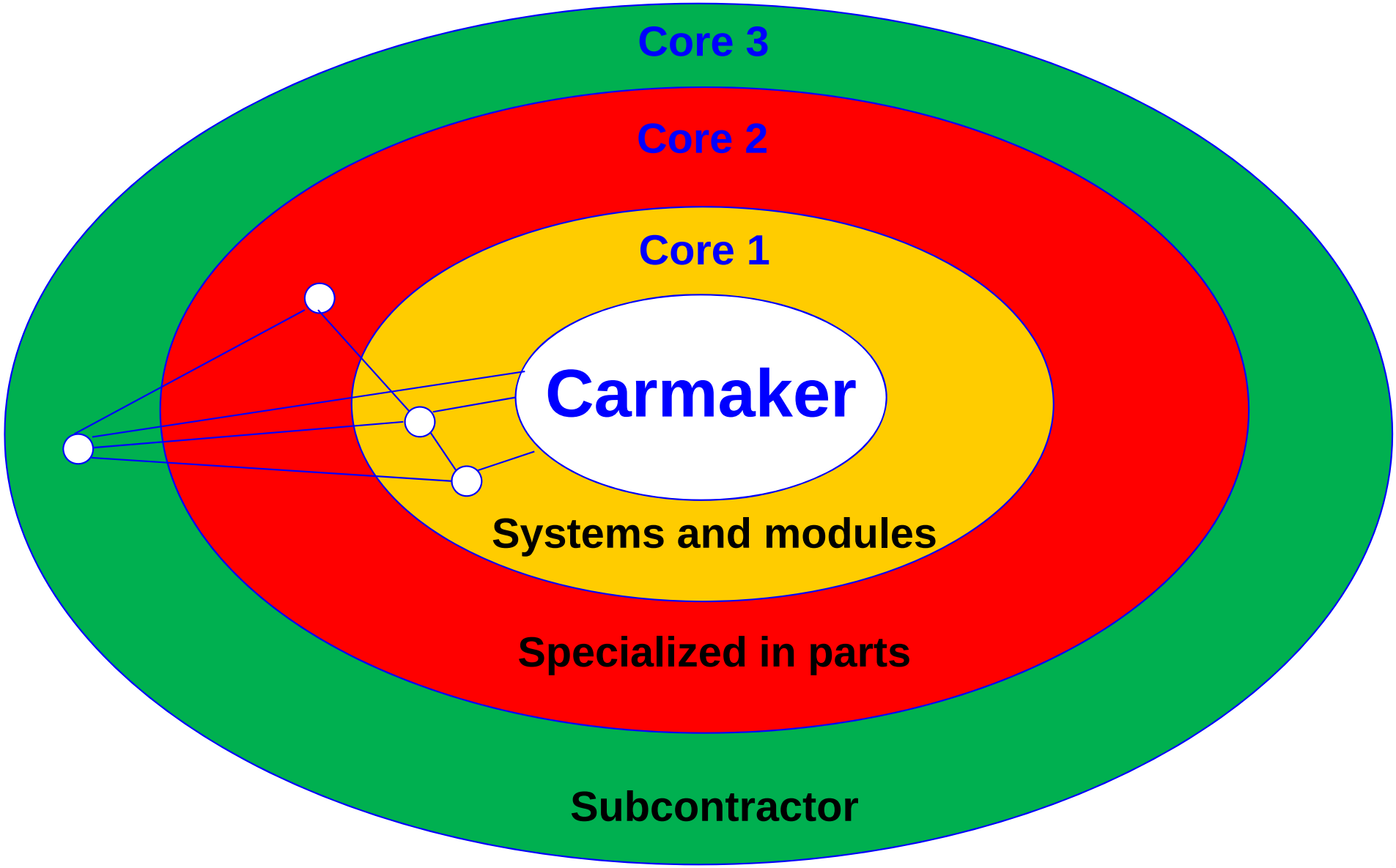
*Non-official data, please do not quote

FROM FLAT HIERARCHY TO PYRAMID HIERARCHY
The relationhip in the pyramid hierarchy



Europe: 1,094 direct suppliers but only 403 can be considered 1st tier supplier

FROM FLAT HIERARCHY TO NETWORK



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2) Although the automotive industry has become more integrated globally since the mid-1980s, it has also developed strong regional-scale patterns of integration.

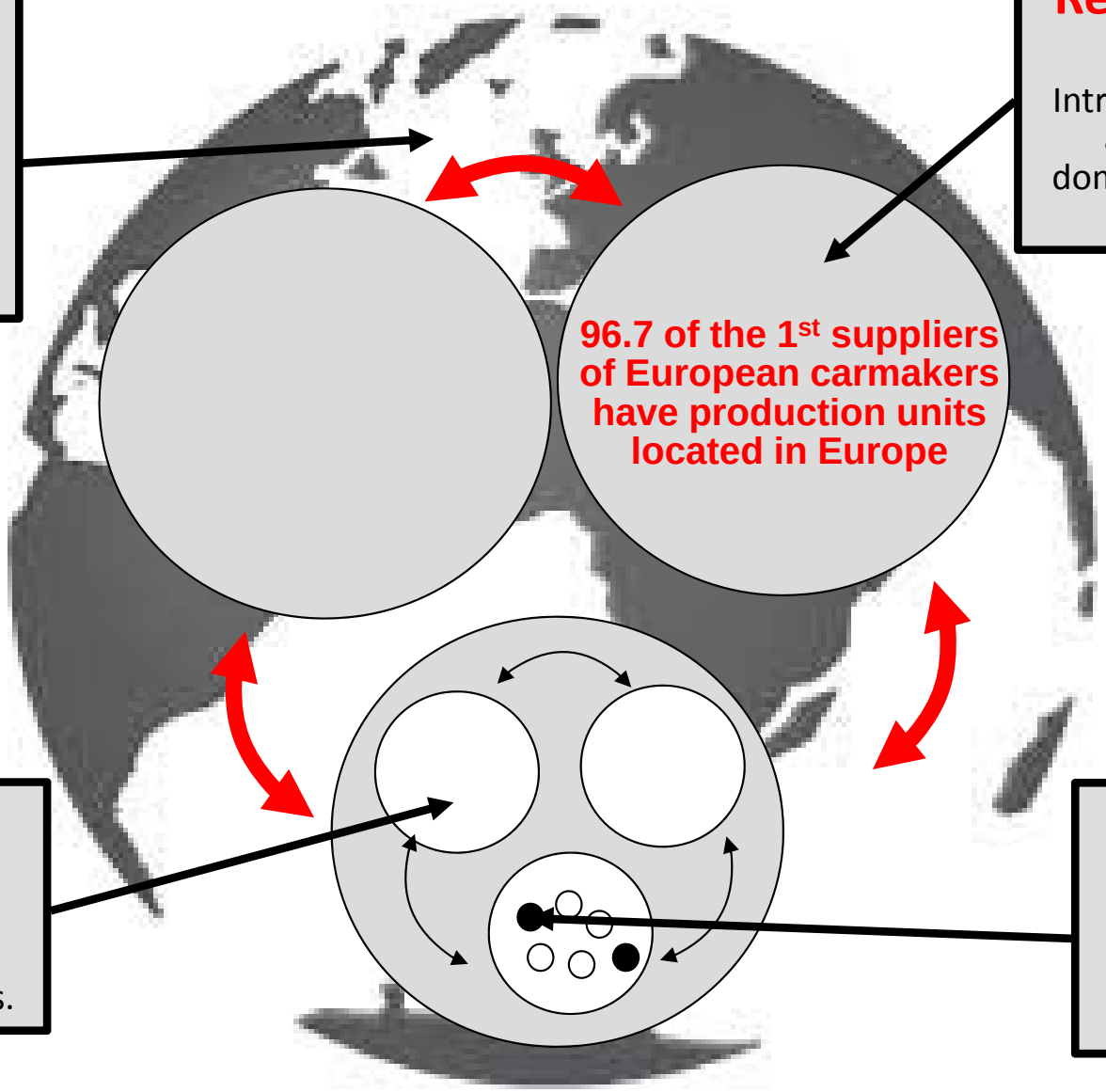
THE NESTED GEOGRAPHIC AND ORGANIZATIONAL STRUCTURE OF THE AUTOMOTIVE INDUSTRY

A global industry

Automakers and global suppliers form buyer-supplier relationships on a global scale. Inter-regional vehicle and parts trade is substantial, but capped by political and operational considerations

Regional production systems

Intra-regional finished vehicle and parts flows are the dominant operational pattern in this industry.



National production systems

Domestic production is still very strong in this industry, and still dominates many national markets.

Local clusters:

Activities tend to be concentrated within clusters of specialized activity, such as
● design and ○ assembly

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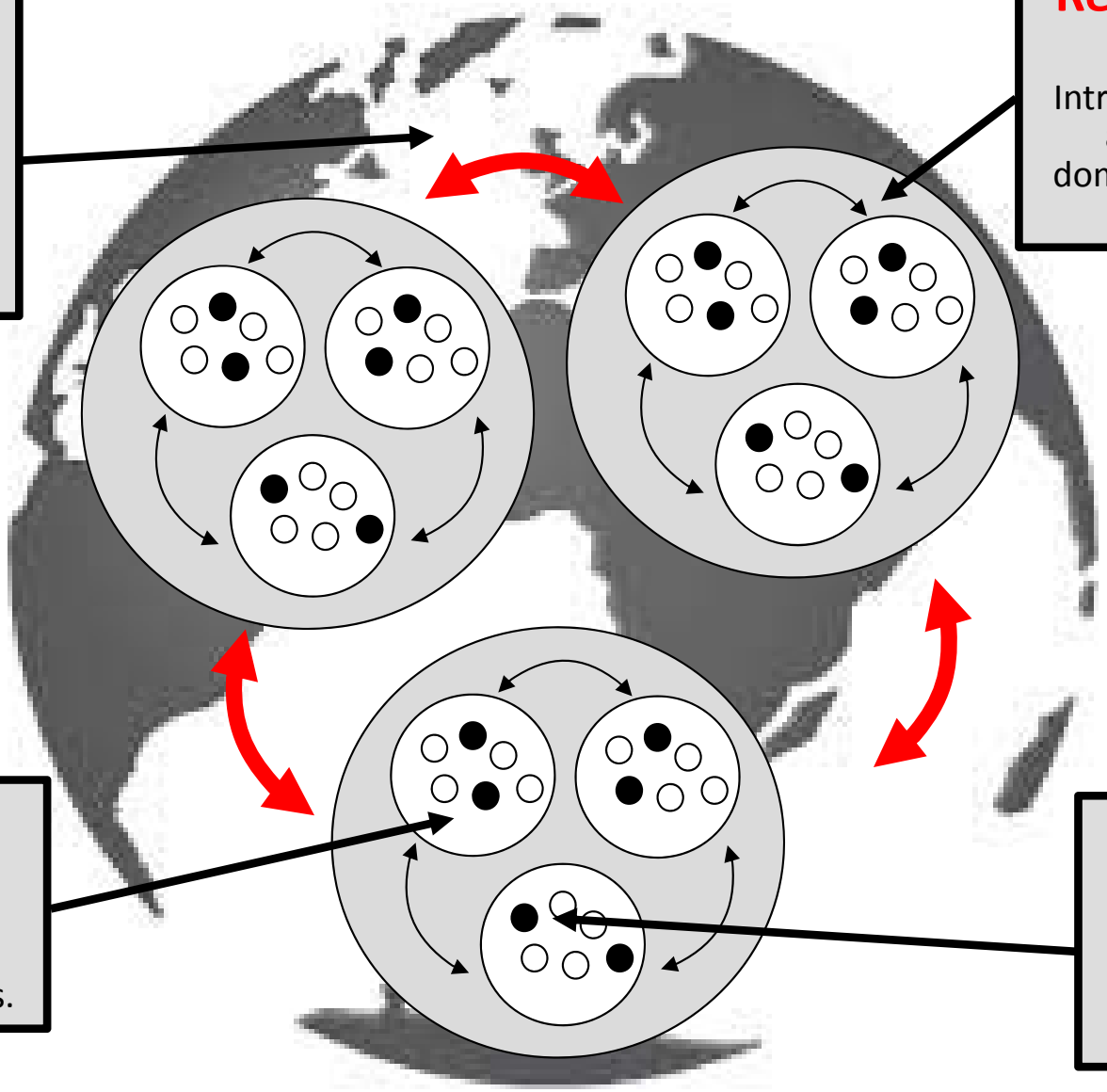

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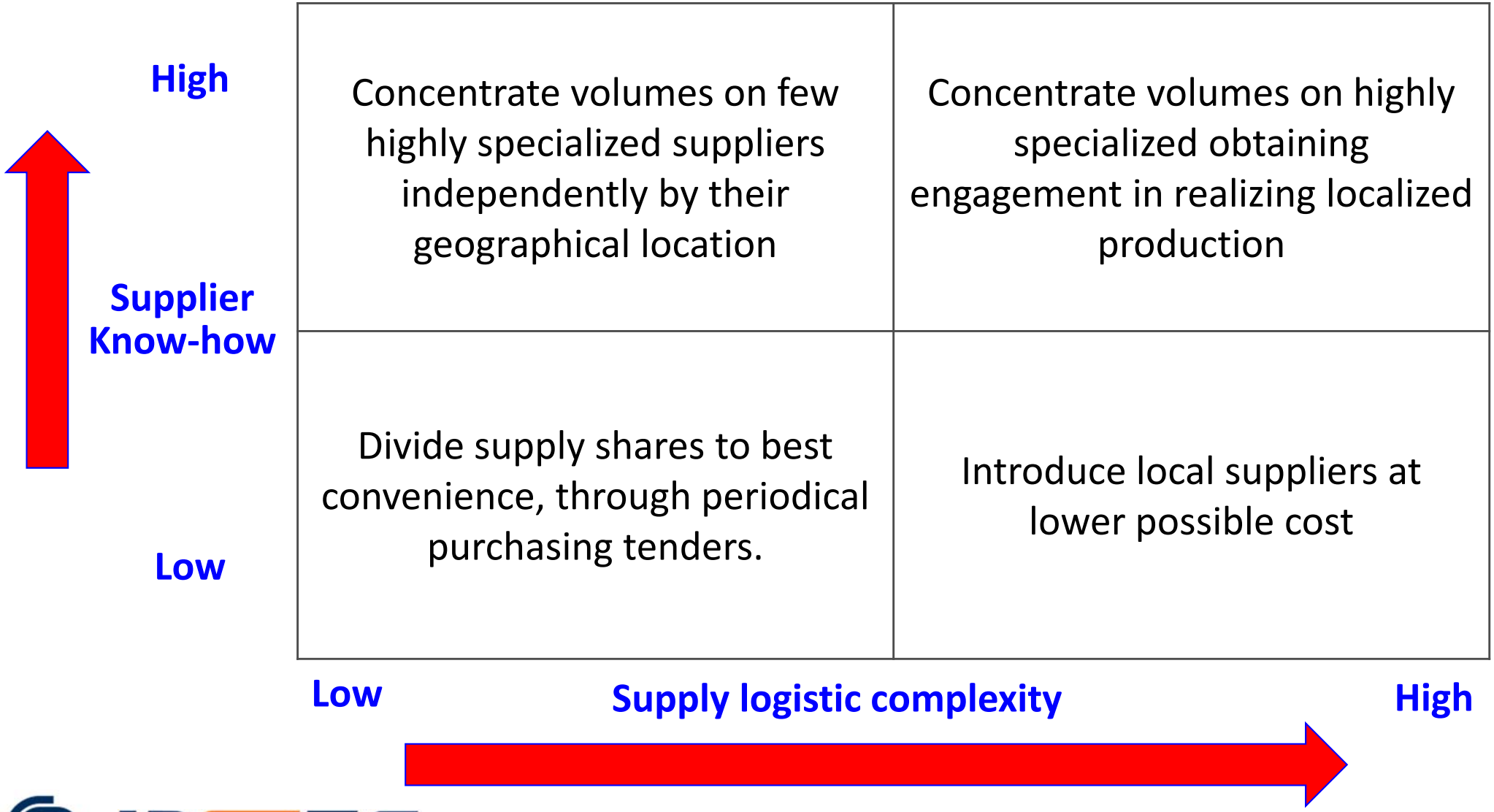
CARMAKERS GLOBAL SOURCING POLICIES



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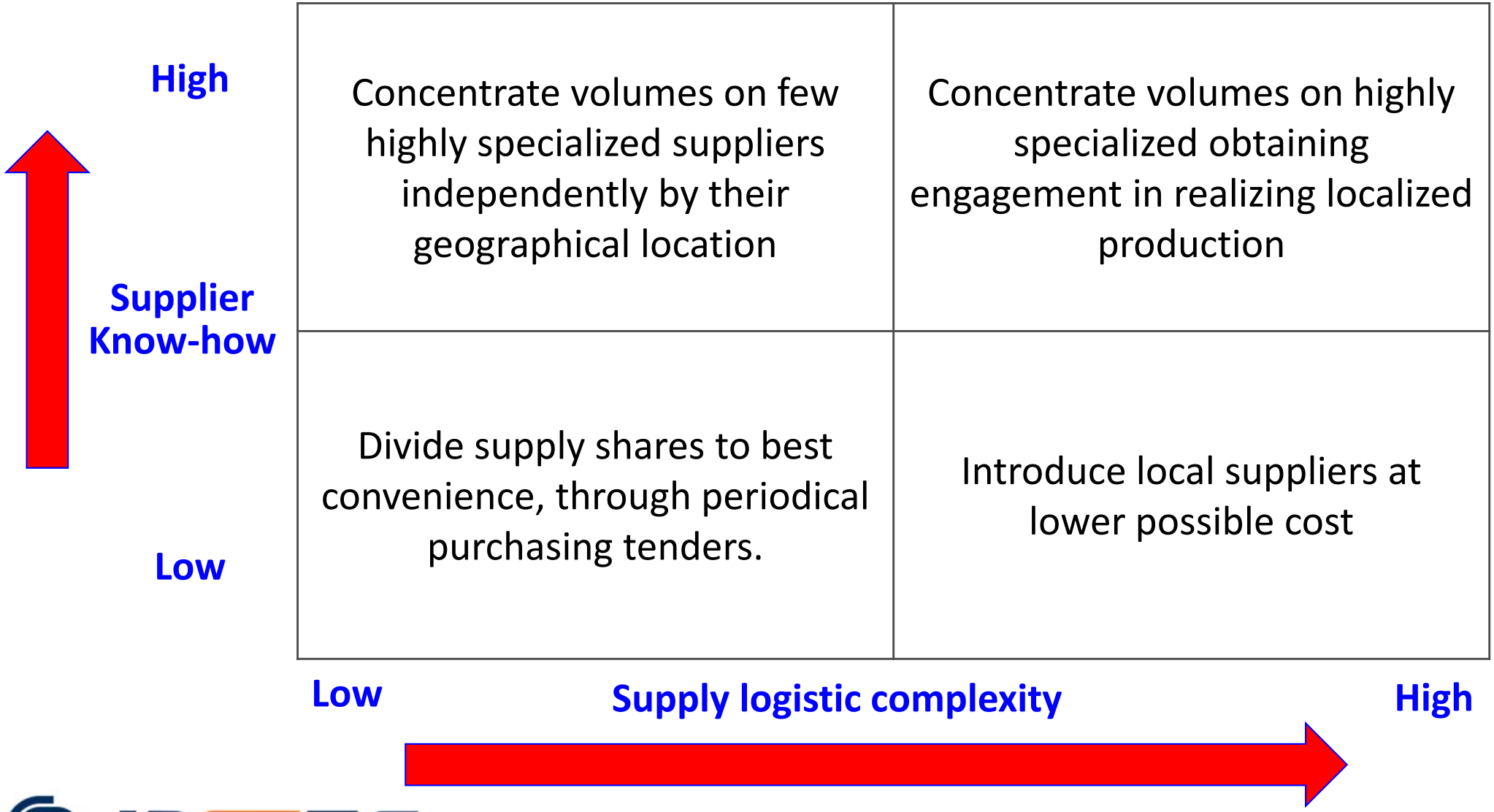

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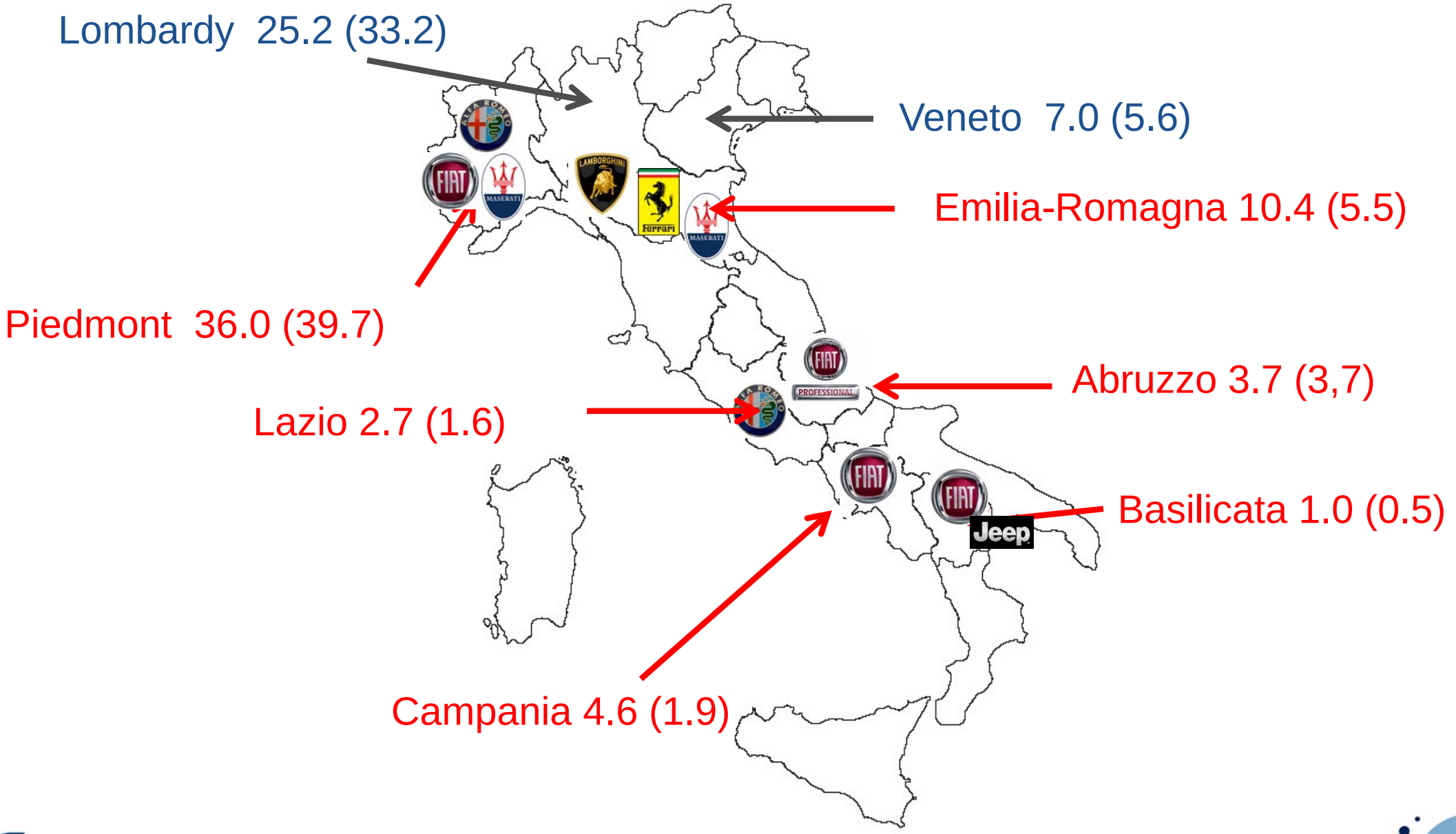
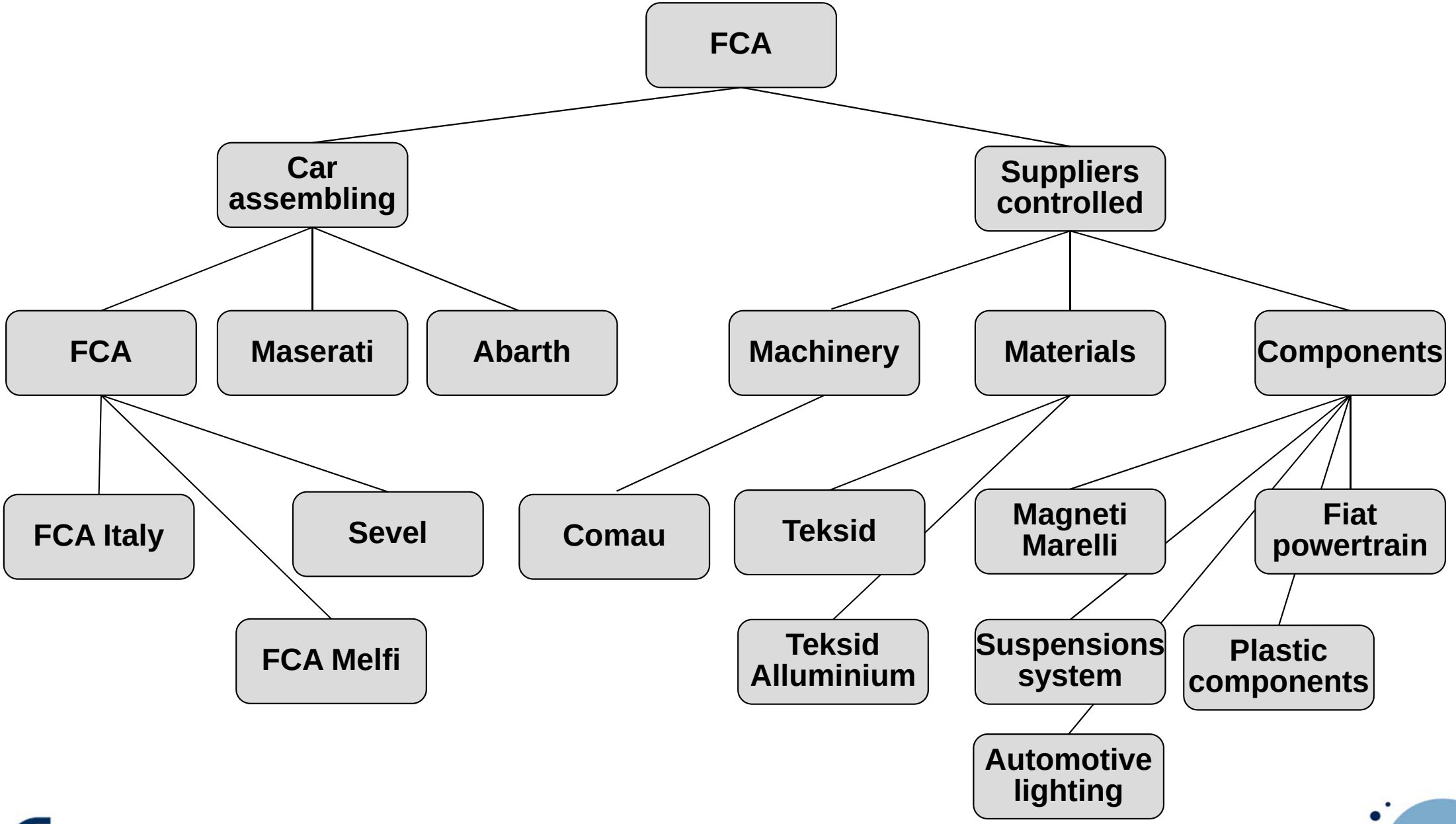
3) Final vehicle assembly, and by extension, parts production, has largely been kept close to end markets because of political sensitivities.

DISTRIBUTION OF AUTOMOTIVE SUPPLIERS BY REGION IN ITALY (%)



THE AUTOMOTIVE GLOBAL VALUE CHAIN AND THE FCA GROUP IN ITALY



THE AUTOMOTIVE GLOBAL VALUE CHAIN AND THE FCA GROUP IN ITALY

IMPORT INTENSITY:
Import on purchasing of materials and components (%)*

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Car assembling	23,5	22,7	22,7	23,7	21,4	23,7	22,8	24,3	26,7
Suppliers controlled	21,9	37,9	37,0	40,3	39,8	35,7	36,9	41,2	36,8
TOTAL FCA GROUP	**23,4**	**23,7**	**23,9**	**26,1**	**24,1**	**25,5**	**24,7**	**26,0**	**27,7**

*Non-official data, please do not quote

TOTAL IMPORT OF MATERIALS AND COMPONENTS OF ITALIAN FCA PLANTS (%)

	2008	2009	2010	2011	2012	2013	2014	2015	2016
AFRICA	0,3	0,6	0,6	0,4	0,3	0,1	0,1	0,0	0,0
ASIA	0,2	0,2	0,3	0,6	0,7	0,9	0,9	1,3	2,2
BRAZIL	1,4	1,1	1,4	1,7	1,9	2,0	1,5	1,1	1,0
CHINA	0,6	0,9	0,9	1,3	1,4	1,6	2,5	2,0	1,7
EST EUROPE	64,7	70,8	66,0	52,8	49,7	53,9	51,9	49,6	52,8
JAPAN	1,4	0,2	0,2	0,3	0,3	0,3	0,4	0,3	2,5
NAFTA	0,4	0,2	0,7	6,3	8,1	5,0	4,9	3,1	3,1
SOUTH AMERICA	0,5	0,2	0,1	0,0	0,0	0,0	0,0	0,0	0,0
USA	0,1	0,3	1,0	4,0	5,0	4,4	6,5	8,5	5,0
WEST EUROPE	30,6	25,5	28,8	32,6	32,6	31,7	31,4	34,2	31,8
TOTAL FCA GROUP	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*Non-official data, please do not quote

THE AUTOMOTIVE GLOBAL VALUE CHAIN AND THE FCA GROUP IN ITALY

EXPORT INTENSITY:
Export on production of Italian (%)*

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Car assembling	33,1	26,7	32,5	32,7	34,5	36,4	36,3	34,6	33,9
Suppliers controlled	14,9	28,8	29,6	37,7	38,7	41,0	40,3	36,9	33,4
TOTAL FCA GROUP	**31,0**	**26,9**	**32,2**	**33,6**	**35,3**	**37,2**	**37,0**	**34,9**	**33,8**

*Non-official data, please do not quote

TOTAL EXPORT OF ITALIAN FCA PLANTS (%)

	2008	2009	2010	2011	2012	2013	2014	2015	2016
AFRICA	1,1	1,2	0,7	1,0	1,3	1,4	1,1	1,1	0,6
ASIA	2,9	2,9	2,5	2,7	3,3	3,4	3,7	4,9	4,0
BRAZIL	2,3	2,6	2,8	2,9	3,5	4,3	3,0	3,8	3,1
CHINA	0,7	0,9	0,9	1,3	1,9	4,5	6,2	3,3	4,9
EST EUROPE	26,9	30,2	30,3	27,5	26,5	25,1	21,8	21,5	21,6
JAPAN	1,4	1,2	1,0	1,8	2,6	2,4	2,3	2,7	3,1
NAFTA	0,1	0,1	0,1	0,2	1,0	1,9	2,0	2,0	2,2
SOUTH AMERICA	0,1	0,2	0,3	0,4	0,6	1,2	0,7	0,7	0,7
USA	2,4	1,3	2,5	3,5	5,1	9,2	12,4	11,5	9,1
WEST EUROPE	62,0	59,4	58,9	58,7	54,1	46,6	46,9	48,6	50,8
TOTAL FCA GROUP	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

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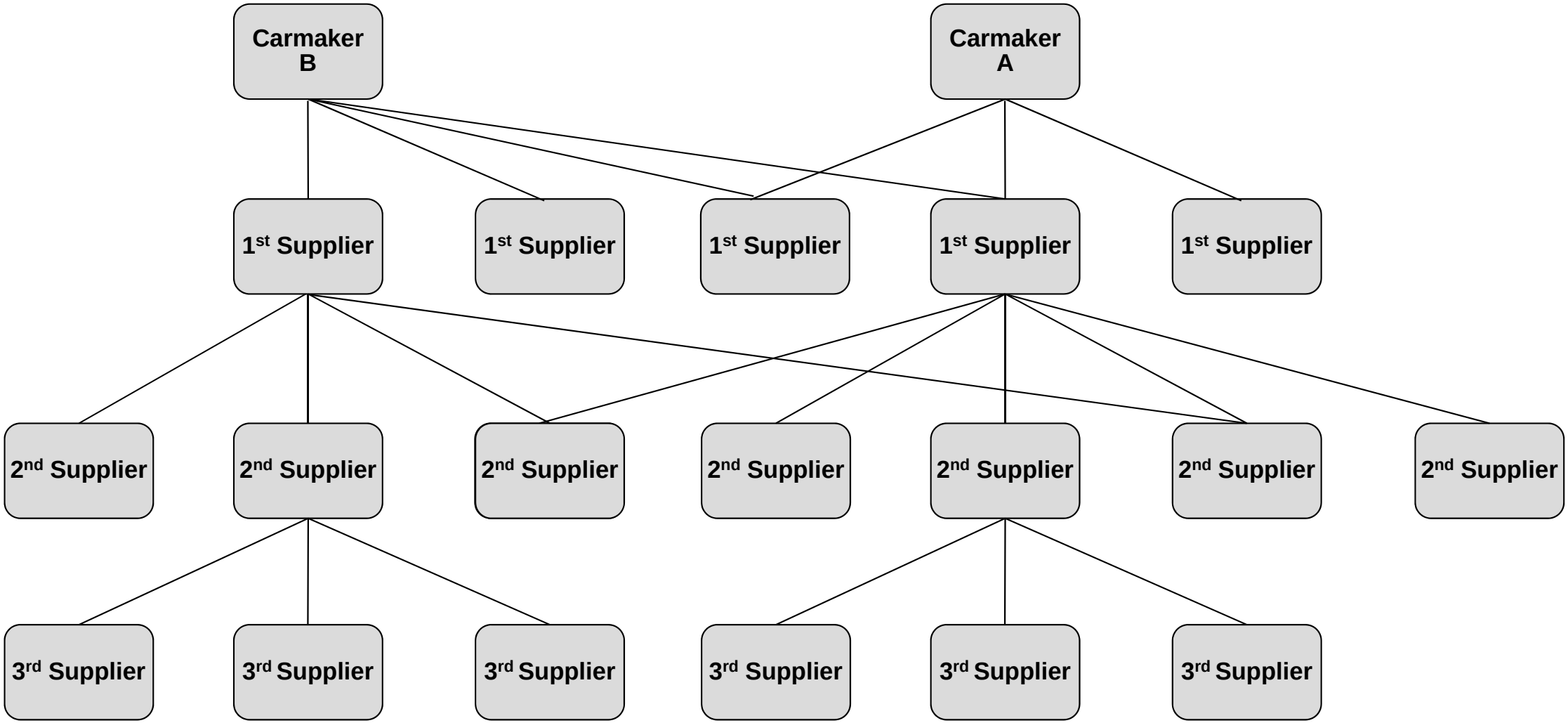
1) An extremely concentrated firm structure: a small number of giant companies (carmakers and mega suppliers) exert an extraordinary amount of power over a pyramid structure of smaller firms.
2) Although the automotive industry has become more integrated globally since the mid-1980s, it has also developed strong regional-scale patterns of integration.
3) Final vehicle assembly, and by extension, parts production, has largely been kept close to end markets because of political sensitivities.
4) Few fully generic parts or subsystems that can be used in a wide variety of end products without extensive customisation.

SUPPLIERS SERVE MULTIPLE CARMAKERS



SUPPLIERS SERVE MULTIPLE CARMAKERS Number of 1st tier supplier by country and carmakers served

	NUMBER OF CARMAKERS SERVED														
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
BRAZIL		1													1
CANADA		2	1			1	1							1	6
CHINA		2					1	1							4
FRANCE	2	9	5		1		3	1		1		1	3	2	28
GERMANY	9	17	12	8	11	8	10	6	6	2	7	4	3	9	112
JAPAN	4	4	4	4	1	2	2	1	2	1	3	5	1	1	35
ITALY	2	3	8		3	1	3	2	1	1	1		1	1	27
SPAIN	1	1	1							1		1	2		7
SWEDEN		1		1	1					1			1	1	6
SWITZERLAND	1	2	2	1	2	2	1	5	1					1	18
TURKEY	1	1	1	1		1		1							6
UK	4	4	2	2			3				1	2		1	19
USA	7	11	3	8	3	5	5	4	6	3	6	6	6	7	80
OTHER COUNTRIES	2	6	7	4	3	2	0	2	3	5	0	1	2	0	37
TOTAL	**33**	**64**	**46**	**29**	**25**	**22**	**29**	**23**	**19**	**15**	**18**	**20**	**19**	**24**	**403**

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SUPPLY TRANSACTIONS IN THE AUTOMOTIVE INDUSTRY (%)

Two-digit code Sector description (NACE)	FRACTION OF TOTAL
29 Manufacture of motor vehicles, trailers and semi-trailers	39.2
22 Manufacture of rubber and plastic products	10.9
28 Manufacture of machinery and equipment	10.0
25 Manufacture of fabricated metal products, except machinery and equipment	7.8
20 Manufacture of chemicals and chemical products	7.4
27 Manufacture of electrical equipment	5.9
26 Manufacture of computer, electronic and optical products	4.5
45 Wholesale and retail trade and repair of motor vehicles and motorcycles	3.7
23 Manufacture of other non-metallic mineral products	2.7
13 Manufacture of textiles	2.6
24 Manufacture of basic metals	1.3
32 Other manufacturing	1.1
62 Computer programming, consultancy and related activities	0.8
43 Specialised construction activities	0.5
31 Manufacture of furniture	0.4
19 Manufacture of coke and refined petroleum products	0.3
33 Repair and installation of machinery and equipment	0.3
30 Manufacture of other transport equipment	0.3
17 Manufacture of paper and paper products	0.2
15 Manufacture of leather and related products	<0.1

Schmitt, A. and Van Biesebroeck, J. (2017) 'In-house production versus specific forms of supplier governance: testing predictions of the global value chains model', *Int. J. Automotive Technology and Management*, Vol. 17, No. 1, pp.26–50.

THE DIMENSIONS OF GLOBAL VALUE CHAIN

- Global value chain analysis provides both conceptual and methodological tools for examining the global economy
  - **Top-down**: a focus on lead firms and inter-firm networks, using varied typologies of industrial "governance"
  - **Bottom-up**: a focus on countries and regions, which are analysed in terms of various trajectories of economic, social and environmental "upgrading" (or "downgrading")

GLOBAL LEVEL

1. Input-output structure
2. Geographic Scope
3. Governance Structure: Lead Firms & Industry Organization

LOCAL LEVEL

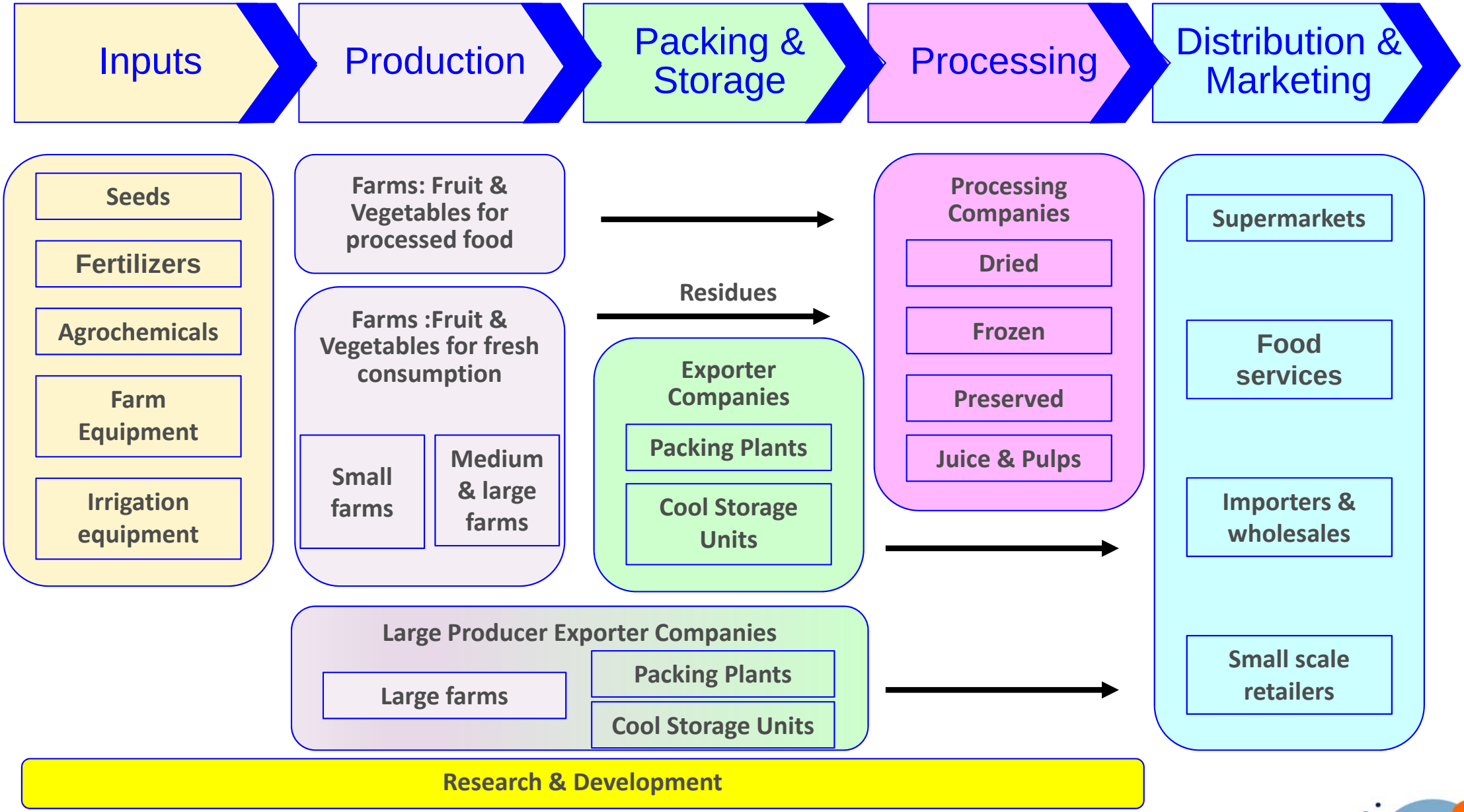
4. Local Institutional Context
5. Industry Stakeholders
6. Upgrading Trajectories

1) INPUT-OUTPUT STRUCTURE

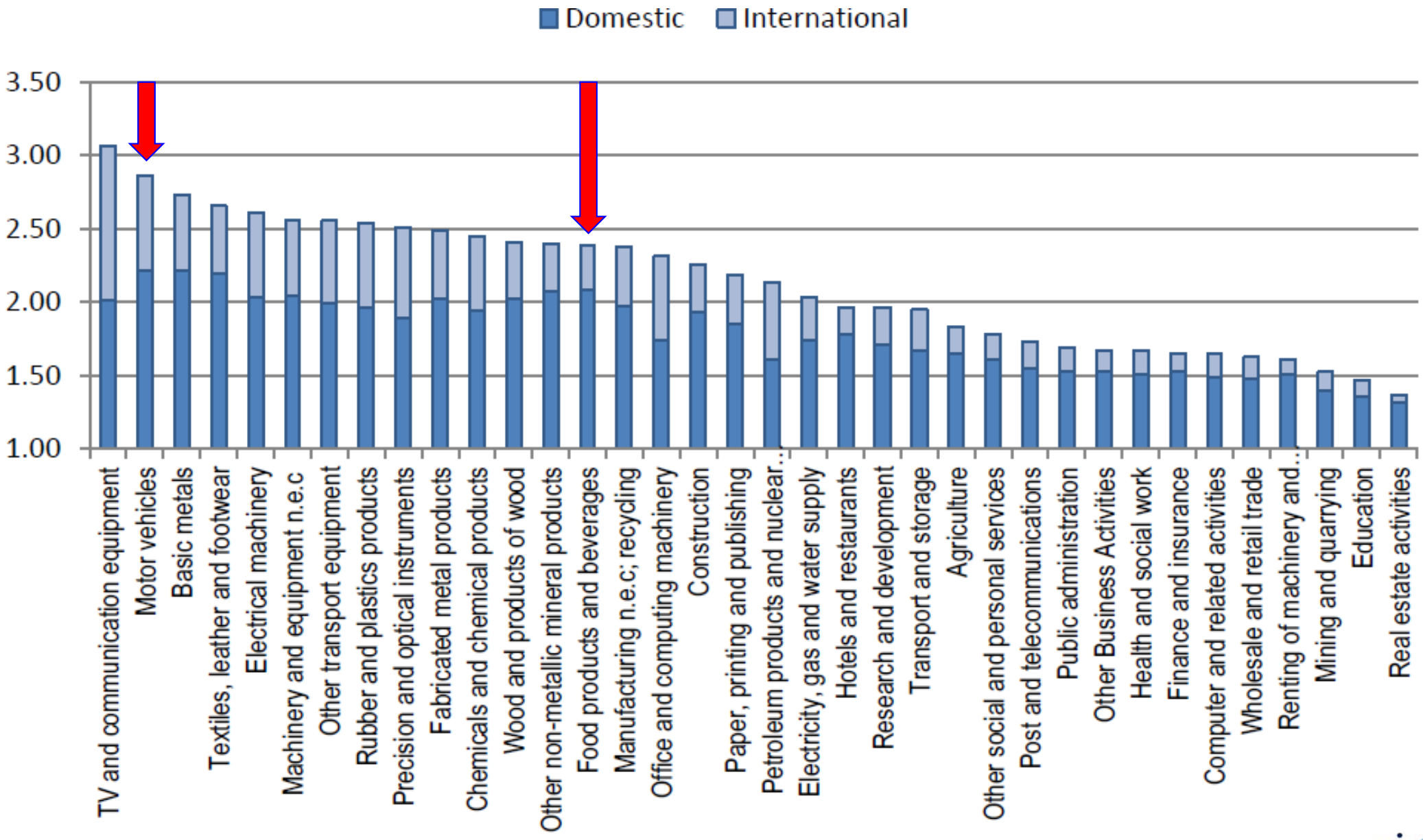
A chain represents the entire input-output process that brings a product or service from initial conception to the consumer's hands.

The main segments in the chain vary according to the industry and involves both goods and services, as well as a range of supporting industries.

1) INPUT-OUTPUT STRUCTURE
The food products and beverages industry



1) INPUT-OUTPUT STRUCTURE
Length of GVCs by industry (OECD, 2009)



1) INPUT-OUTPUT STRUCTURE: A top-down definition of the automotive industry based on NACE classification

Inputs	First processing	Intermediate processing	Final processing	Distribution
772	4,683	2,794	119	114,638
2410 Basic iron and steel and of ferro-alloys	2030 Paints and varnishes	2211 Tires	2910 Manufacture of motor vehicles	451 Sale of motor vehicles
245 Casting of metals	2219 Rubber	261 Electronic components		452 Maintenance
4672 Wholesale of metals and metal ores	2221 Plastic	2920 Bodies		453 Sale of parts
	2311 Flat glass	2931 Electronic equipment		771 Renting and leasing
	255 Forging,	2932 Parts and accessor		
	256 Treatment and coating of metals	272 Batteries		

TOTAL ITALY: 141,660

Research & Development: 7112 Engineering activities; 7120 Technical testing; 741 Specialised design activities — 7,761

Machinery: 281general purpose machinery; 284 Machine tools; 289 Other machinery — 10,892

1) INPUT-OUTPUT STRUCTURE: A bottom-up definition of the automotive industry based on product precialization

ANFIA – Italian association of the automotive industry filiere (number of members)

NACE code	N. of members	NACE code	N. of members
1310	2	2825	4
1395	2	2829	2
2000	2	2849	2
2221	2	2910	12
2420	2	2920	42
2443	2	2930	2
2450	2	2931	8
2500	2	2932	114
2529	2	3030	2
2550	16	3091	2
2561	56	3099	2
2562	4	4520	2
2572	2	4531	4
2610	2	4674	2
2711	2	4690	2
2733	2	6200	2
2790	6	6820	4
2815	18	7112	4
2820	2	8292	2
2822	2	**TOTAL**	**344**

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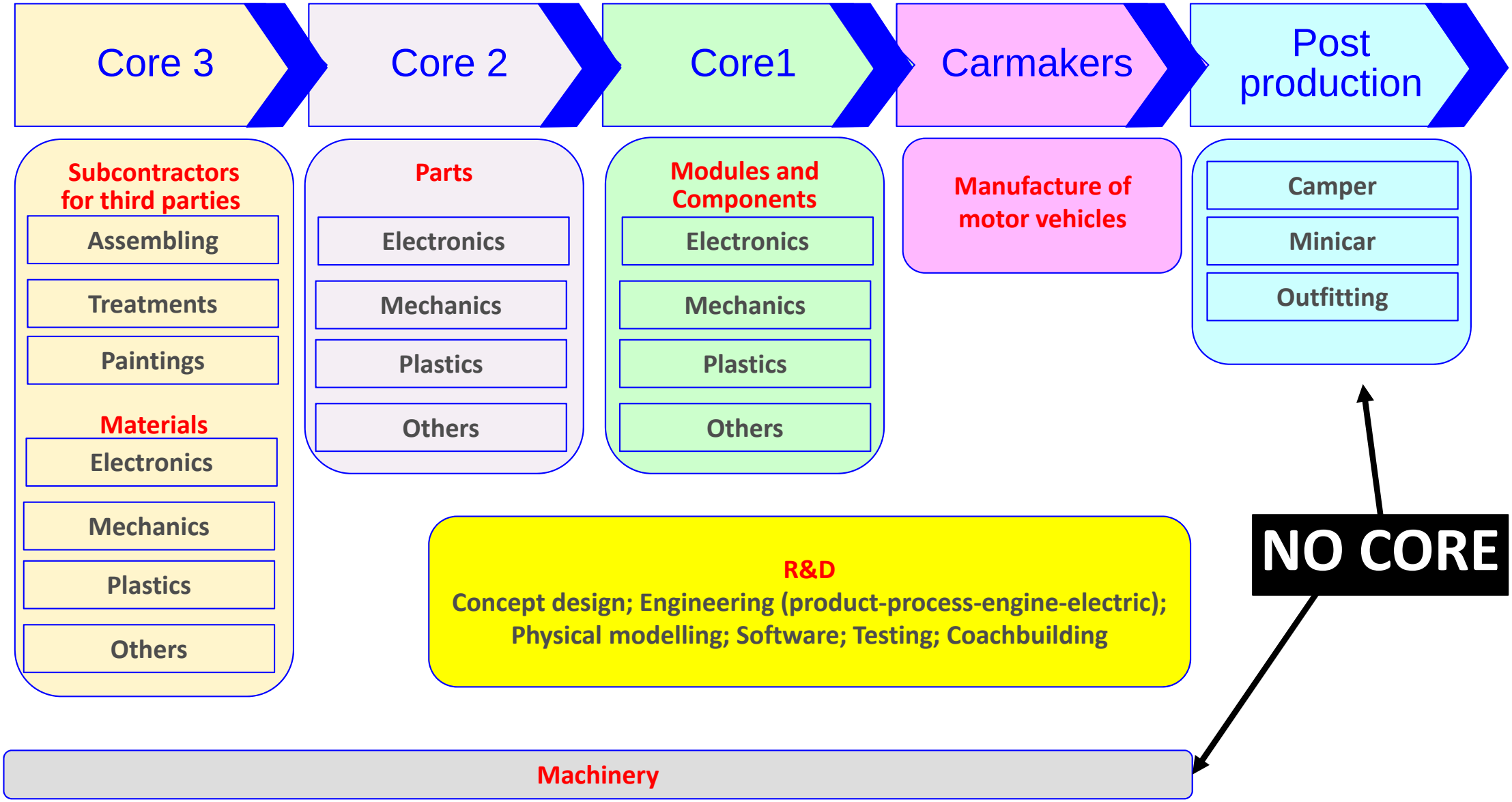


1) INPUT-OUTPUT STRUCTURE: The Italian automotive industry (apart carmakers)

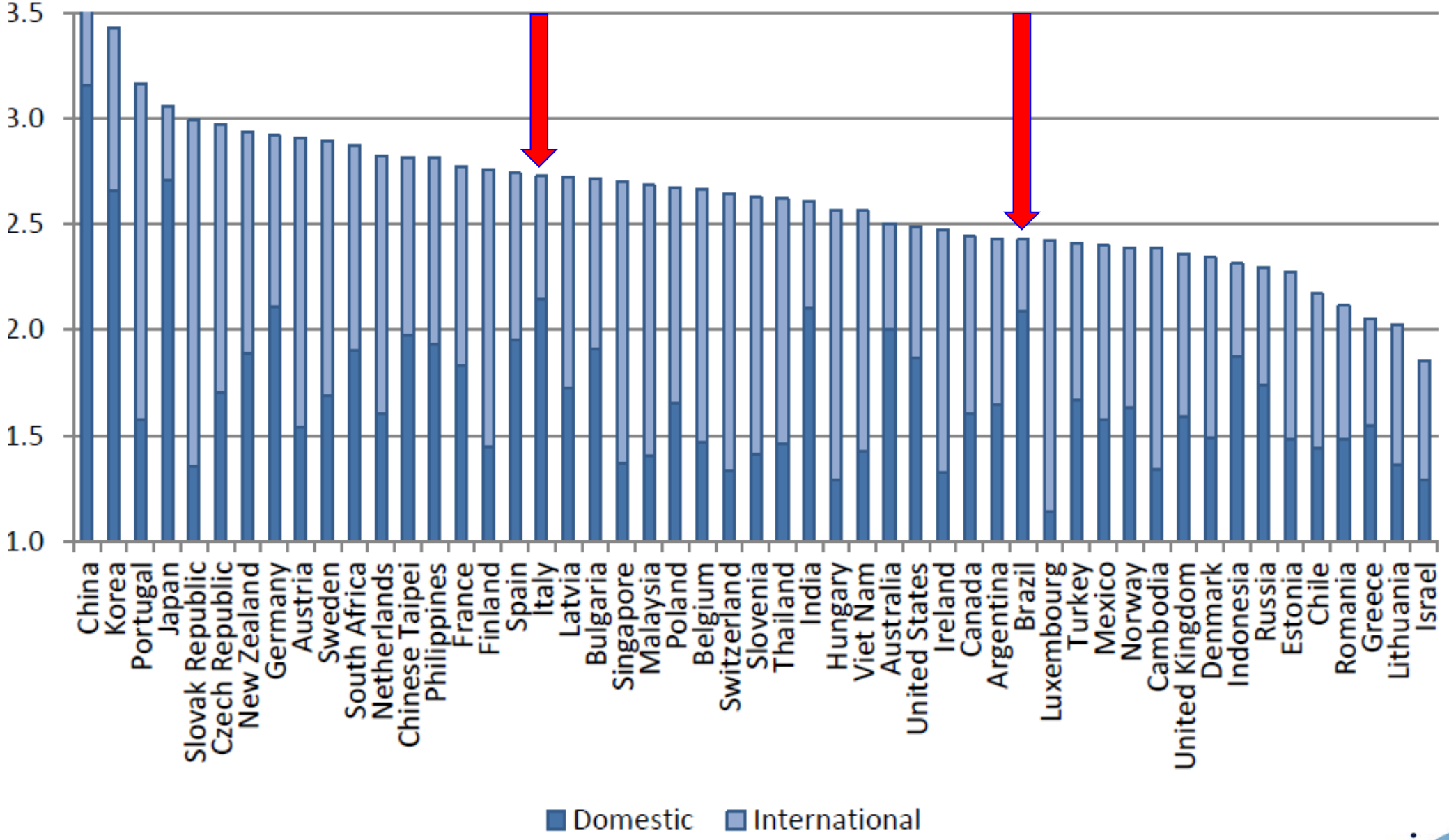
	STRICT	AFTERMARKET	MOTORSPORT	TOTAL
Core 1 – Components				
Electronics	62	7	2	71
Mechanics	146	39	10	195
Plastics	38	6	1	45
Others	4			4
R&D	152		5	157
Core 2 - Parts				
Electronics	137	47	13	188
Mechanics	792	159	57	959
Plastics	233	48	16	291
Others	21	10	2	32
Core 3 - Subcontractors				
Assembling	1	1		2
Treatments	118	1	1	120
Paintings	10			10
Core 3 - Materials				
Electronics	2	2		4
Mechanics	33			33
Plastics	44	3	1	48
Others	22	2		24
TOTAL	**1,815**	**273**	**95**	**2,183**

NO CORE	
Camper	38
Minicar	13
Outfitting	328
Machinery	72
TOTAL	**451**

2) GEOGRAPHIC SCOPE

- Two main steps: value chain mapping and analysis
- Value chain mapping is the process of identifying the geography and activities of stakeholders involved from taking a good or service from raw material to production and then to the consumer (input-output). One task is the identification of the lead firms in each segment thus informs the country-level positions.

2) GEOGRAPHIC SCOPE
Length of automotive GVCs by country (OECD, 2009)



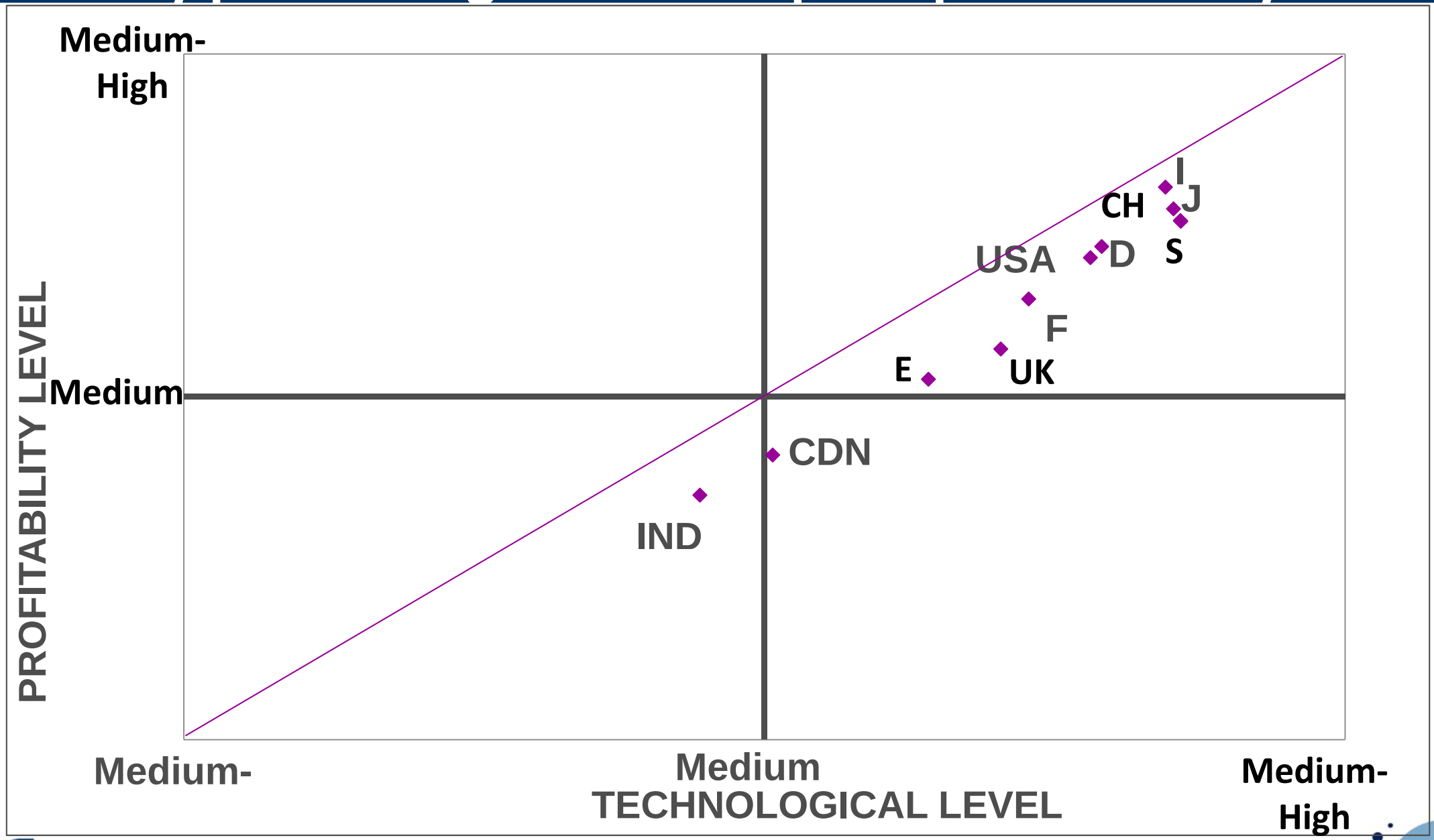
2) GEOGRAPHIC SCOPE

- Two main steps: value chain mapping and analysis
  - Value chain mapping is the process of identifying the geography and activities of stakeholders involved from taking a good or service from raw material to production and then to the consumer (input-output). One task is the identification of the lead firms in each segment thus informs the country-level positions.
- Value chain analysis to define the position of different countries in the value chain can allow to identify countries that have successfully upgrading and then examine the policies and changes they implemented to successfully achieve that functional upgrading.

2) GEOGRAPHIC SCOPE Component allocation by origin country in the European production system (%)

	D	USA	F	J	I	CH	S	UK	CDN	E	IND	Others	TOTAL
Bonding/Adhesives	16,5	38,0	7,4		2,5	2,5		**33,1**					100
Tires	7,9	13,5	11,2	**46,1**	21,3								100
Cables	18,5	51,8		2,4	0,6	1,2		1,2	1,8	**22,6**			100
Electrical & Electronics	29,2	25,5	6,3	1,6	10,1	**26,4**	0,3	0,3				0,3	100
Front End/Rear End Module	26,4	7,5	**49,1**	3,8	3,8				5,7			3,8	100
Mirrors	21,7	24,6			0,5			1,5	**38,4**	6,9	6,4		100
Airbags	0,6	38,7	0,6	18,3			**39,9**		0,3	1,5			100
Engine Shafts	**89,5**	7,4	1,9						1,2				100
Starter Motor	43,5	2,8	34,3	19,4									100
Engine Control Unit	45,4	19,7	5,3	5,3	**24,3**								100
Security	4,5	**83,6**	7,5	4,5									100
Fasteners/Fixings	20,8	31,3	24,0	2,7	2,0	2,0	0,3	12,5	0,5	0,6	0,1	3,3	100
Body	29,1	9,2	14,9	2,1	2,3	7,7	0,8	2,5	13,4	1,5	3,8	12,8	100
Doors-Tailgate	44,5	14,8	7,9	3,3	3,0	1,2	0,3	0,3	7,9	10,5	1,8	4,4	100
Interior	29,3	20,3	16,1	1,3	1,6	6,9	0,1	0,7	9,3	10,6	0,3	3,7	100
Wheels	42,3	17,0	2,6	1,5	8,2	3,6	0,5	7,7	1,5	1,5	0,5	12,9	100
TOTAL	**39,2**	**23,6**	**12,8**	**4,7**	**3,4**	**3,2**	**2,4**	**2,4**	**2,3**	**2,2**	**0,3**	**3,5**	100

2) GEOGRAPHIC SCOPE
Country positioning in the European production system



3) GOVERNANCE STRUCTURE

- Governance analysis allows to understand how a chain is controlled and coordinated when certain actors in the chain have more power than others.
  - 5 governance structures of GVC based on three variables:
    - **Complexity of transactions**. More complex transactions require greater interaction among actors in GVCs and thus stronger forms of governance is required rather than simple price-based markets
    - **Codifiability of transactions**. Some industries codify complex information so that data can be handed off between GVC partners with relative ease, often using advanced information technologies. GVC partners must have access and expertise for dealing with such codified information
    - **Competence of suppliers**. The ability to receive and act upon complex information or instructions from lead firms requires a high degree of competence on the part of suppliers.

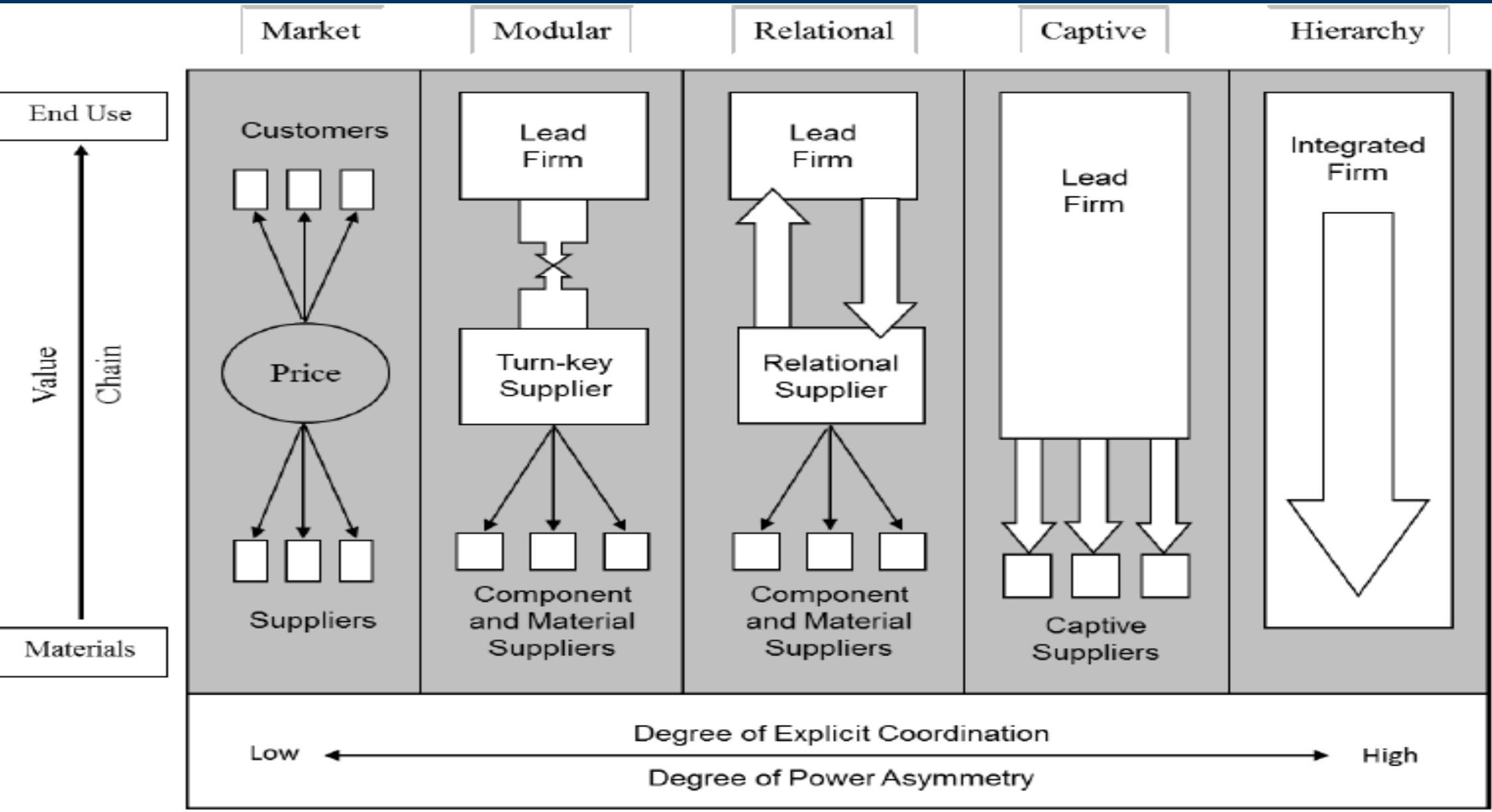
3) GOVERNANCE STRUCTURE
Determinants of GVC Governance

	Governance type	Complexity of transaction	Ability to codify transactions	Capability of supplier
Network forms	Market	Low	High	High
	Modular	High	High	High
	Relational	High	Low	High
	Captive	High	High	Low
	Hierarchy	High	Low	Low

1 2 3 4 5 6

1. Increasing complexity of transactions (harder to codify transactions; effective decrease in supplier competence)
2. Decreasing complexity of transactions (easier to codify transactions; effective increase in supplier competence)
3. Better codification of transactions (open or de facto standards, computerization)
4. De-codification of transactions (technological change, new products, new processes)
5. Increasing supplier competence (decreased complexity, better codification, learning)
6. Decreasing supplier competence.(increased complexity, new technologies, new entrants)

3) GOVERNANCE STRUCTURE



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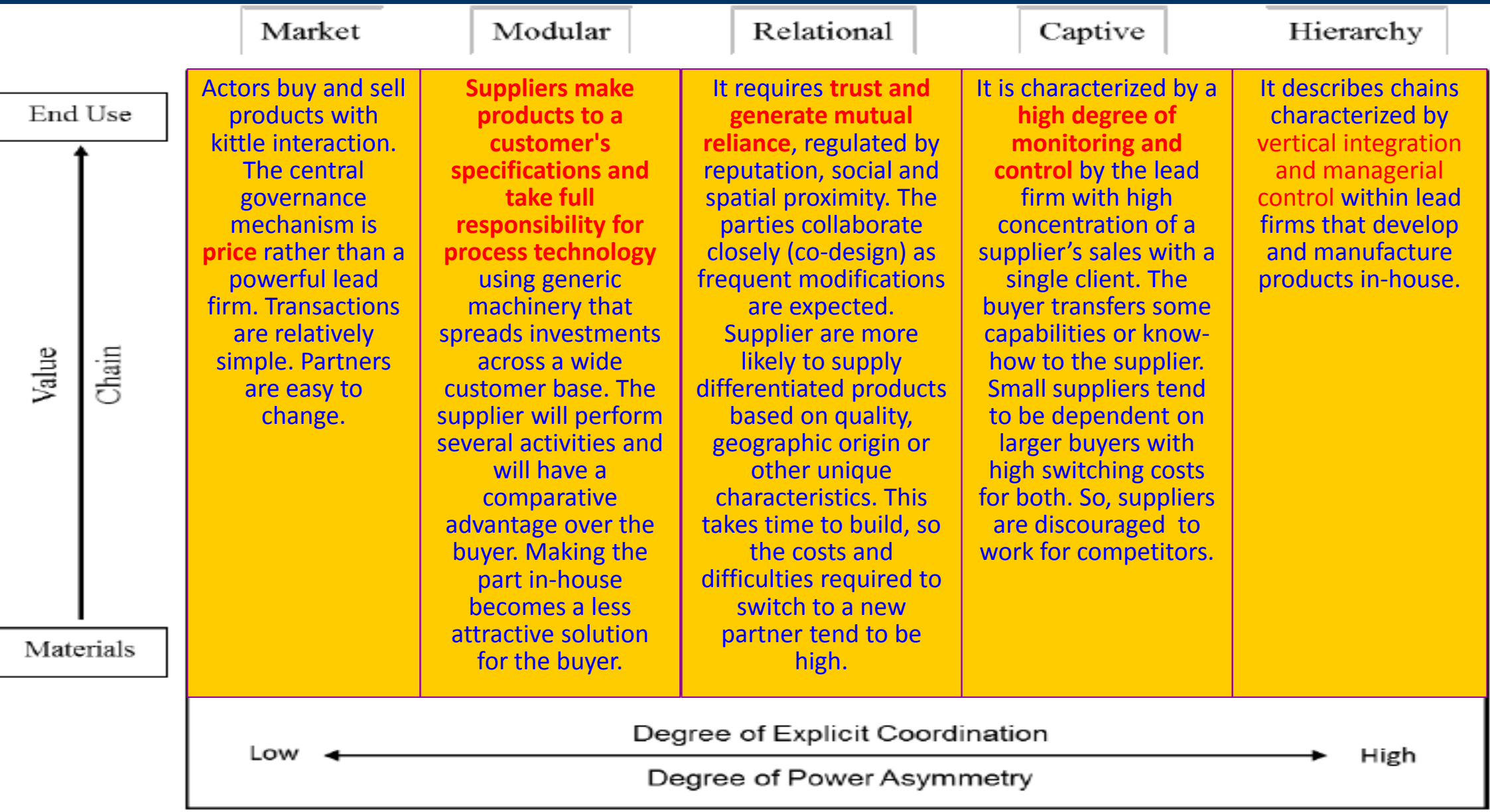

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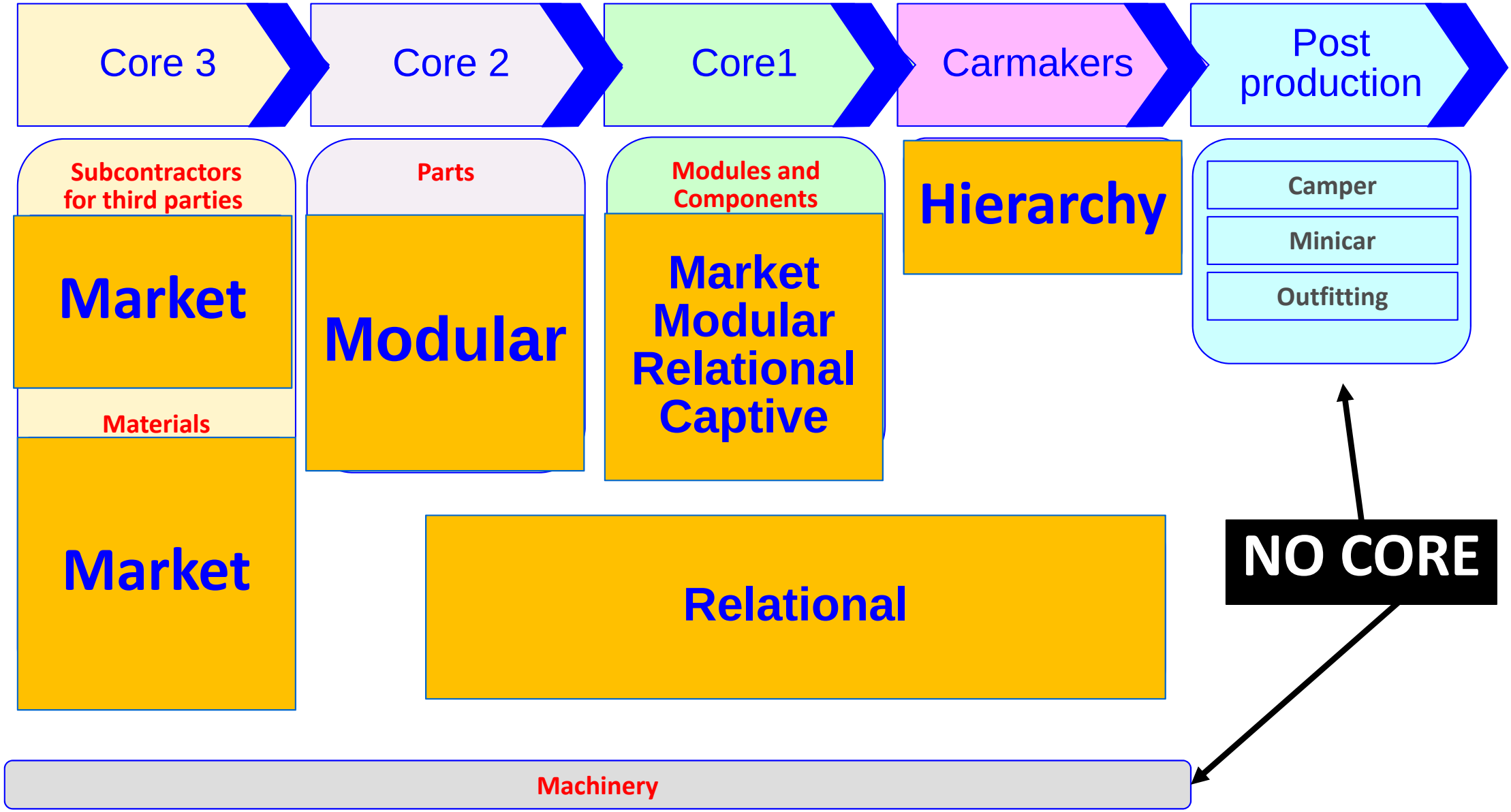


3) GOVERNANCE STRUCTURE

COMPONENTS	SUPPLIERS	HH	TECH	GVC
Chassis/Underbody	62	386,7	3,8	Market
Wheels	72	418,4	3,5	Market
Body	117	444,5	3,0	Market
Interior	122	474,6	3,0	Market
Steering System	73	519,9	4,2	
Engine Components	96	559,6	3,5	
Exhaust & After Treatment	74	596,9	3,8	
Electrical & Electronics	57	619,2	4,2	
Thermal System	96	645,6	4,0	
Suspension System	67	645,9	3,6	
Fasteners/Fixings	153	674,0	3,0	Market
Transmission	85	745,1	4,2	
Doors/Tailgate	117	752,7	3,2	Market
Seating	80	813,4	3,6	
Braking	64	853,7	4,3	
Control Units	49	872,9	4,4	
Hoses/Pipes	83	909,4	3,0	
Infotainment	40	913,8	4,4	
Bumpers	42	972,2	2,6	
Engine Covers	50	1008,3	3,5	
Fuel System	69	1032,8	3,5	
Axles	58	1059,1	3,5	
Handles/Latches	44	1098,6	2,5	
Sensors	52	1112,7	3,7	
Actuators	31	1183,4	3,2	
Safety System/Driver Assistance	44	1195,8	4,7	
Switches	33	1203,9	2,4	

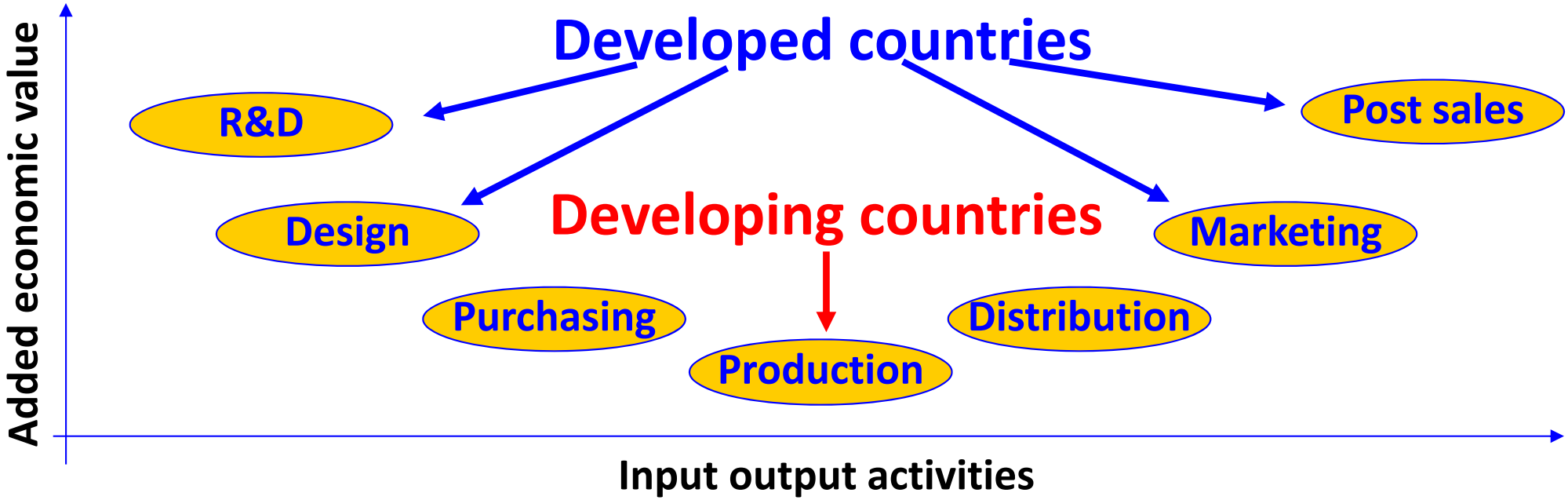
COMPONENTS	SUPPLIERS	HH	TECH	GVC
Bearings/Bushes	43	1241,2	3,6	
Noise, Vibration, Harshness	69	1250,4	4,0	Relational
Engine cylinders	34	1348,8	3,5	
Roof	54	1367,1	3,4	
Washer/Wiper Systems	28	1427,9	3,0	
Lighting	39	1529,1	4,3	
Engine Control Unit	21	1665,7	4,3	
Gaskets/Seals	54	1739,8	3,0	
Electric Motors	15	1754,3	3,3	
Belts/Tensioners	22	2004,7	3,6	
Textiles	33	2038,8	2,8	
Front End/Rear End Module	20	2132,1	3,2	
Lock System	35	2160,0	3,5	
Glass	46	2163,6	3,8	Modular
Bonding/Adhesives	16	2514,1	3,3	
Mirrors	16	2668,7	2,3	
Starter Motor	12	2860,6	2,8	
Coatings	19	2882,1	3,8	
Tires	6	2902,8	4,0	Modular
Engines turbo/superchargers	21	2935,4	3,8	
Airbags	15	2954,5	4,0	
Alternators	6	3103,6	3,3	
Cables	21	3117,4	3,0	
Engine pistons	12	4060,9	3,4	
Batterys	22	4404,7	4,2	Modular
Engine Shafts	20	4851,1	3,5	
Security	16	5292,7	3,5	

4) LOCAL INSTITUTIONAL CONTEXT
5) INDUSTRY STAKEHOLDERS

- The institutional framework identifies how local, national and international conditions and policies shape the globalization in each stage of the value chain
  - Economic conditions include the availability of key inputs:
    - Labour costs,
    - Available infrastructure and access to other resources such as finance;
    - Social context governs the availability of labour and its skill level, such as female participation in the labour force and access to education;
    - Institutions includes tax and labour regulation, subsidies, and education and innovation policy that can promote or hinder industry growth and development.
- All the industry actors are mapped in the value chain and their main role in the chain is explained.
  - It is important to consider how relations between these actors are governed and in a position to drive change. This is critical to identify the key players in the value chain and for upgrading.

6) UPGRADING TRAJECTORIES
The smiling curve

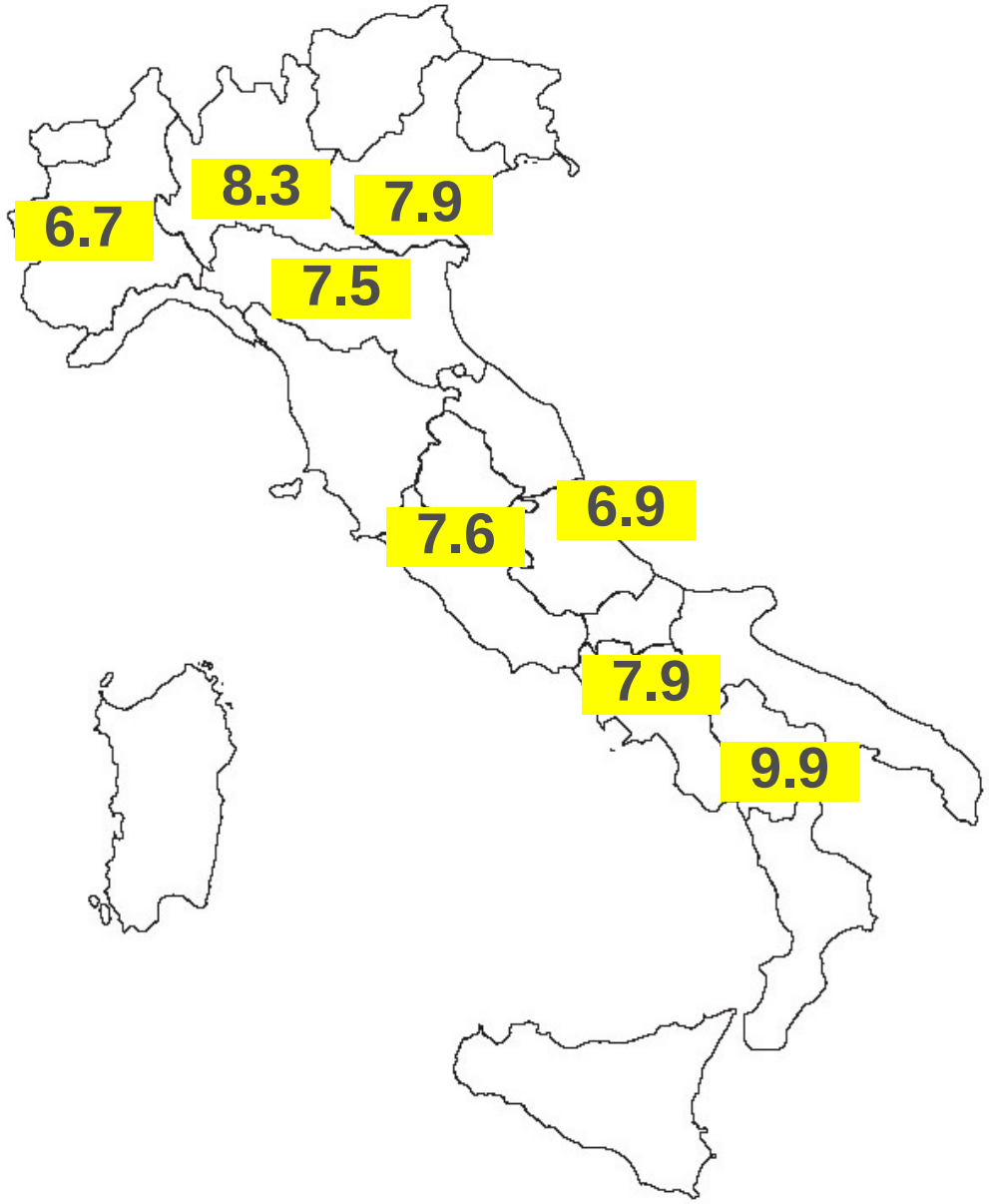
- In GVC the most value creation is often found in:
  - **Upstream activities** such as design, product development, R&D and manufacturing of key parts and components;
  - **Downstream activities** such as marketing, branding and customer service;
  - **Assembly**, often offshored, to emerging economies, represents only a small part of value generation.



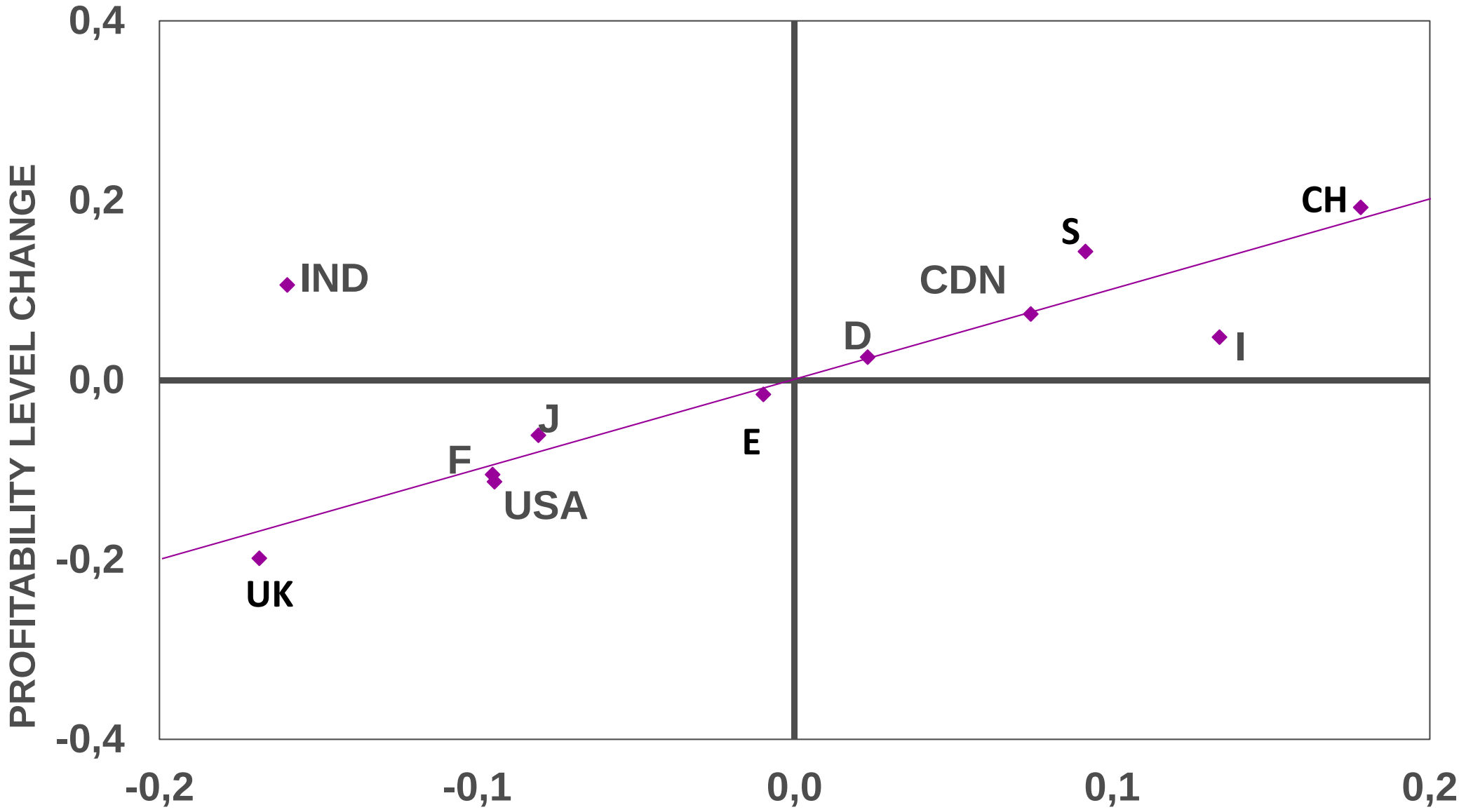
6) UPGRADING TRAJECTORIES
Profitabilies indexes by core activities (%, 2016)

The Italian Automotive Industry	ROI Return on investments	ROS Return on Sales	WCT Working Capital Turnover
Engineering & Design	0.1	0.1	1,07
Core 1 – Components	5.6	3.0	1.84
Core 2 – Parts	9.5	6.2	1.53
Core 3 - Subcontractors	7.1	6.0	1.19
Aftermarkets	8.3	7.5	1.11
Motorsport	12.0	11.4	1.05

6) UPGRADING TRAJECTORIES
Return on Investiment (ROI) distribution by regions



6) UPGRADING TRAJECTORIES



6) UPGRADING TRAJECTORIES

➔ Upgrading refers to the strategies that stakeholders (countries, regions and firms) can take to improve their position within the global economy

- **Product upgrading**: involves a shift to more sophisticated, complex, better quality products as well as producing a larger range of products.
- **Process upgrading**: implies reduction in costs, productivity and flexibility increases by reorganizing the production system or investing in new or better equipment/technology.
- **Functional upgrading:** Changing the mix of activities and acquiring new skill intensive functions (i.e. from manufacturing to design).
- **Chain upgrading**: Applying competences acquired in one function of a chain and using them in a different sector/chain.

6) UPGRADING TRAJECTORIES
Policy implications

Governance type	Complexity of transaction	Ability to codify transactions	Capability of supplier	Predominant learning mechanisms
1) Market	Low	High	High	Importing-exporting strategies
2) Modular	High	High	High	Accomplish international standards Knowledge embodies technical definitions
3) Relational	High	Low	High	Mutual learning
4) Captive	High	High	Low	Deliberate knowledge transfer
5) Hierarchy	High	Low	Low	Imitation and spillovers

- From 5-4 to 2 thanks to improvements in MSTQ organizations
- From 5-4 to 3 thanks to improvement in “local” systems
- From 5 and 4 to 2 and 3 thanks to innovation systems supporting the coevolution of suppliers and GVC competences

6) UPGRADING TRAJECTORIES
Policy implications

- Promote and sustain the identification of new alternative GVC
  - Increasing capabilities in the supply-base
- Support SMEs in complying with international standards
  - MSTQ organizations facilitate the handling of complex transactions and modular chains are more likely to prevail
- Sustain the upgrading of local suppliers through a well-functioning innovation systems
  - Active technical bodies where the chain leaders and their local partners can meet, ease the exchange of knowledge and reduce the complexity of transactions (training programs, high tech incubators, Science and Technology program co-developed by the State and the private sector)
- Experiment with new forms of private-public partnerships
  - (participatory systems for setting research agendas, intermediary organizations linking small firms with universities)

AGENDA

- Clarifying global value chain (GVC) concepts
- Some peculiarities of the automotive global value chain
- The dimensions of the global value chains
  - Global context
    - Input-output structure
    - Geographic Scope
    - Governance Structure
  - Local context
    - Local Institutional Context
    - Industry Stakeholders
    - Upgrading Trajectories
- **The future of global value chains**
- The future of the automotive global value chain

THE FUTURE OF GLOBAL VALUE CHAINS
OECD extimations (2017)

SCENARIOS	IMPACT ON GVC
Trade policy	?
New (low-cost) producers in manufacturing	Slightly positive
Growing demand in emerging economies	Positive
Rising wage costs	Negative
The digitalisation (IT) of production	Strong negative
Rising transport costs	Slightly negative

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- **The future of the automotive global value chain**

THE FUTURE OF THE AUTOMOTIVE GLOBAL VALUE CHAIN
Some facts

➔ Supplier scarcity and mega suppliers

Turnover 2016

1	Toyota	254,7	**12**	**Bosch**	**80,9**
2	WV	240,2	13	Suzuki	70,3
3	Daimler	169,4	14	PSA	59,8
4	GM	166,3	15	KIA	52,7
5	Ford	151,8	16	Renault	49,0
6	Honda	129,2	**17**	**Continental**	**43,4**
7	FCA	116,9	**18**	**ZF**	**38,4**
8	SAIC	113,8	**19**	**Magna**	**36,4**
9	Nissan	108,1	**20**	**Denso**	**36,1**
10	BMW	104,1	**21**	**Aisin**	**31,3**
11	Hyundai	88,0	22	Mazda	28,9

THE FUTURE OF THE AUTOMOTIVE GLOBAL VALUE CHAIN
New perspectives and therories

- Supplier scarcity and mega suppliers
- Change of perspective in supplier selection
  - from performance criteria (quality, price, technology, delivery) to
  - reputational criteria (appeal, trust, motivation)
- Social exchange theory
  - Actor starts a “business” relationship if the partner is sufficiently attractive, then checks if the relationship matches initial expectations, and then decides to continue or stop a relationship depending on the availability of alternative

THE FUTURE OF THE AUTOMOTIVE GLOBAL VALUE CHAIN
New perspectives and therories

- Supplier scarcity and mega suppliers
- Change of perspective in supplier selection
- Social exchange theory
- **Customer attractiveness literature**
  - Outsourcing increases the value added coming from suppliers, and customers are less able to influence them; reductions in technological spillovers induce customers to sign exclusivity agreements, so they can profit from suppliers' innovations
  - The scarcity of innovative suppliers makes it difficult to find substitute suppliers and relationships become stabilised;
  - The adoption of key account management in suppliers obliges customers to be more attractive;
  - Global sourcing reduces customer attractiveness, distant relationships entail greater risks than those established with local customers

THE FUTURE OF THE AUTOMOTIVE GLOBAL VALUE CHAIN
New perspectives and therories

- Supplier scarcity and mega suppliers
- Change of perspective in supplier selection
- Social exchange theory
- Customer attractiveness literature
- **The cycle of the preferred customership:**
  - **Customer attractiveness** motivates suppliers and increases collaborative relationships along the supply chain
  - **Supplier satisfaction** relies on the confirmation/disconfirmation paradigm
  - **Preferred customer status** is granted if a significant increase in competitive advantage and business performance is reached. It requires great efforts and costs on the part of both the supplier, in assessing and comparing the performance of each relationship, and the customer, in beating the competition