Global Quality Manufacturing and Global Germany

MNCs, Recursivity and the Home Economy

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Changing Firm Global Product & Production Strategies

- Our Study: German Automobile & Machinery Production Globalization
- Changing world demand
  - China-Asia-Brazil-India~Russia: Rapid growth
  - Europe-North America: replacement demand, slow growth
    - Key: Mid-Central Europe part of Europe
- Shift from Export to Offshore Production
  - Strategic Shift: "Produce where you sell"
  - Export still an important option
    - For regional advantage

Shifting analytic frame for political economic analysis

- New Forms of Multinationals
  - Neither Product-life Cycle nor Heterarchy Logic
  - Interdependent recursivity
- Global Nation-States
  - No sovereign containers
  - Interdependence means local problems have global roots
- Governance of interdependent/recursive processes

Presentation in Three Steps

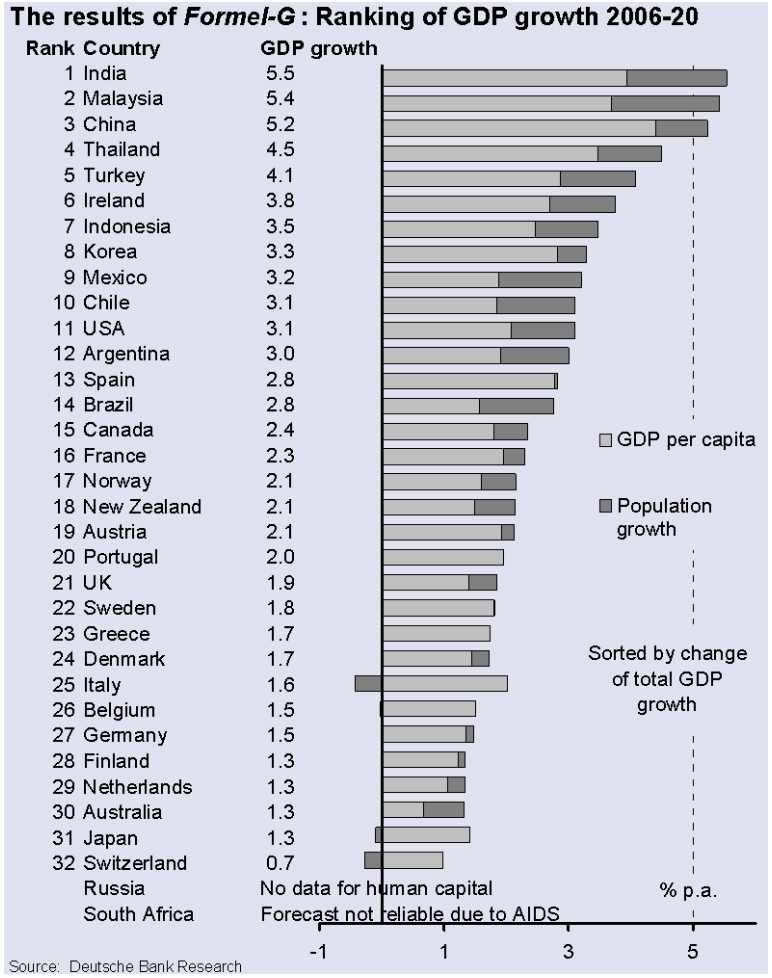
- 1.) New Distribution of Global Mfg Demand
  - New MNC strategies
- 2.) New Multinationals
  - Interdependent and recursive governance practices
- 3.) Consequences for the Home Country
  - Global Nation States
  - Category transgression problems

Step One: New World

- New Distribution of Global Manufacturing Demand
- New Multinational Strategies

Global Electrical and Electronics Goods Market growth 1998-2007

Deutsche Bank Research Formel G Forecasts of Global Growth Centers in 2020



Market potential in emerging world is greater than current rates of growth suggest

Saturation almost reached

Consumers worldwide (m)		
	2001	2015
USA	236	284
Germany	70	76
Japan	110	112
China	76	700

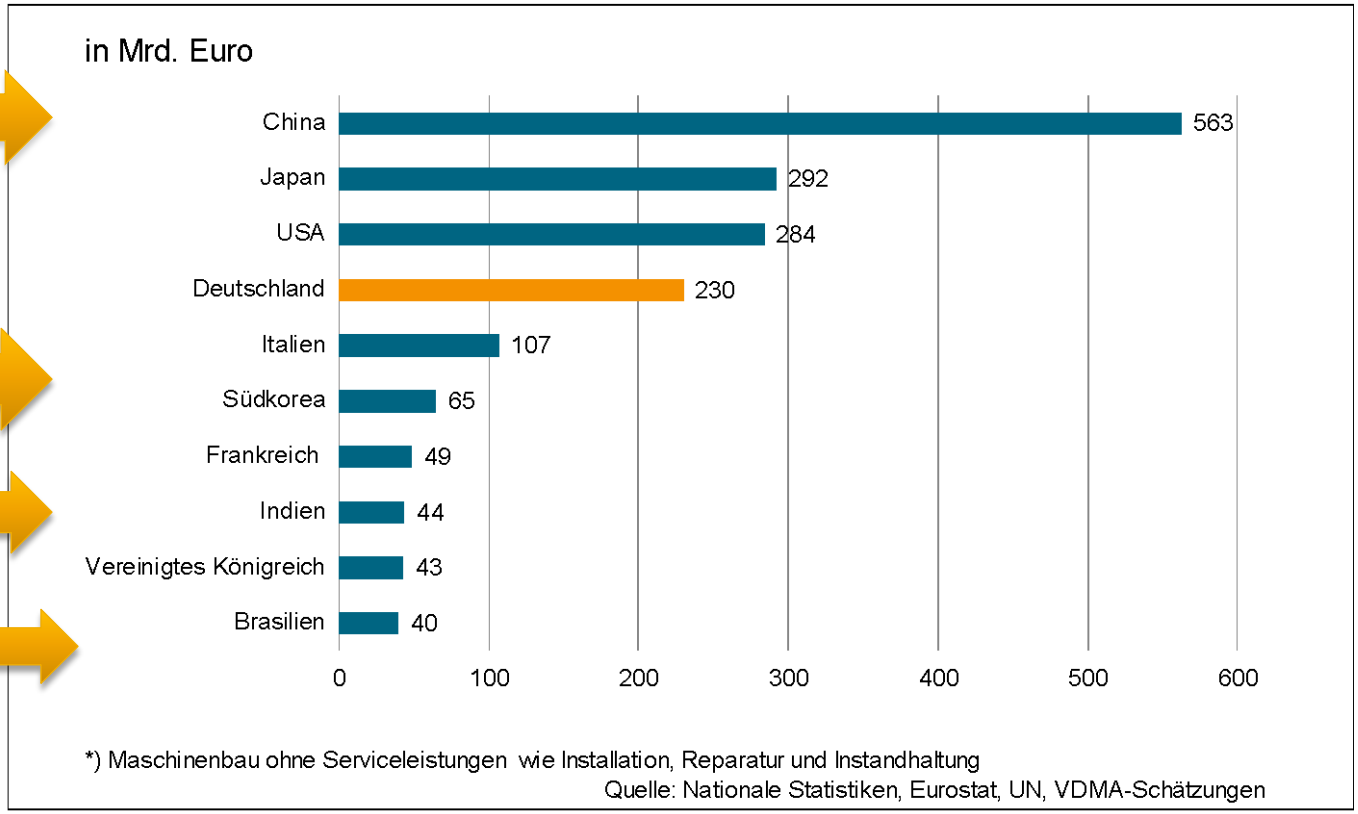
Source: German Chamber of Commerce in China

World's ten largest (non-communist) machinery producing economies (by total sales)--1980

Country	Total sales (in Deutsch Marks)
USA	DM 328,164 million
Japan	DM 153, 101 million
West Germany	DM 121,880 million
United Kingdom	DM 71,800 million
France	DM 43,336 million
Italy	DM 38,890
Switzerland	DM 14,600 million (VDMA estimate)
Sweden	DM 13,587
Canada	DM 11,887 million
Netherlands	DM 9,692 million

World Machinery Sales Top Ten Economies 2011

Weltmaschinenumsatz* 2011
TOP-10-Länder-Ranking



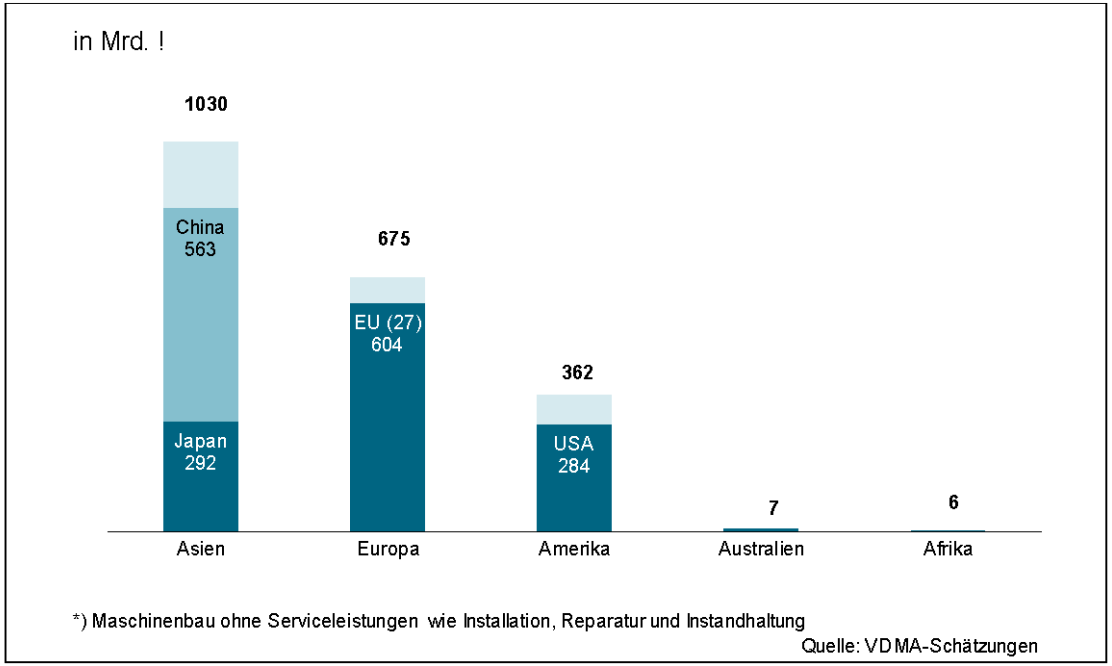
*) Maschinenbau ohne Serviceleistungen wie Installation, Reparatur und Instandhaltung

Quelle: Nationale Statistiken, Eurostat, UN, VDMA-Schätzungen

World Machinery Sales by Region 2011

Volkswirtschaft und Statistik

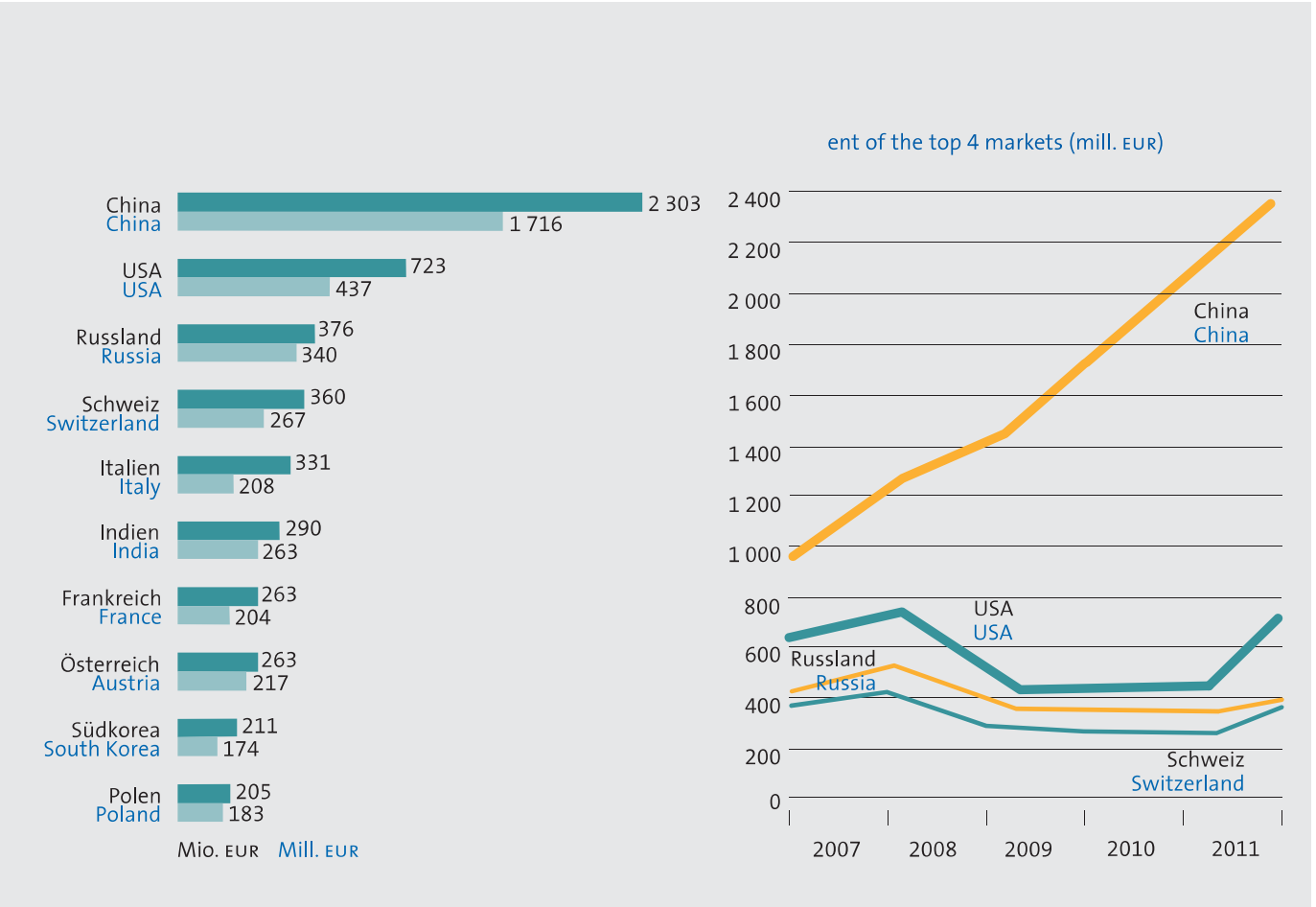
Weltmaschinenumsatz* 2011 nach Regionen



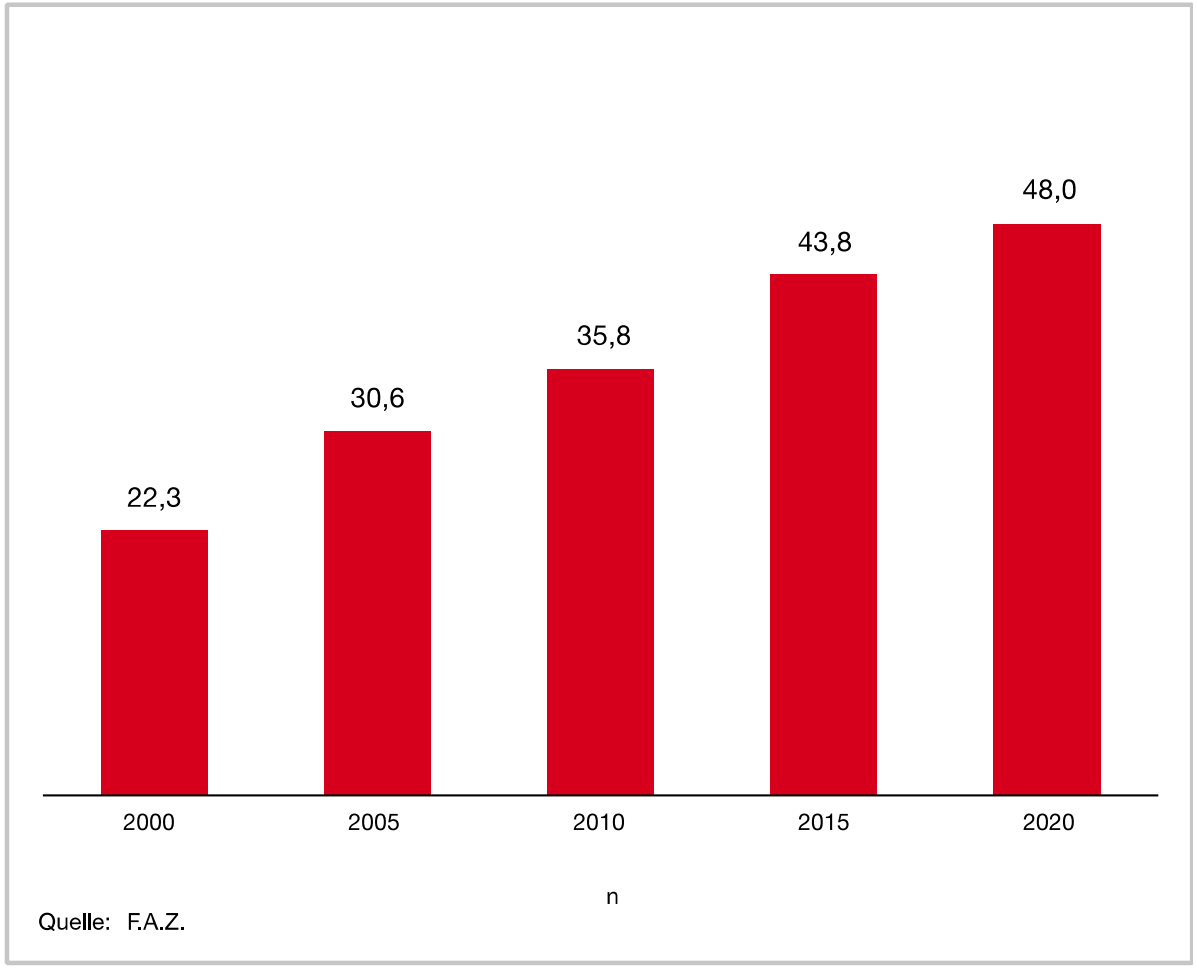
*) Maschinenbau ohne Serviceleistungen wie Installation, Reparatur und Instandhaltung

Quelle: VDMA-Schätzungen

German machine tool exports: major customer markets 20010/11

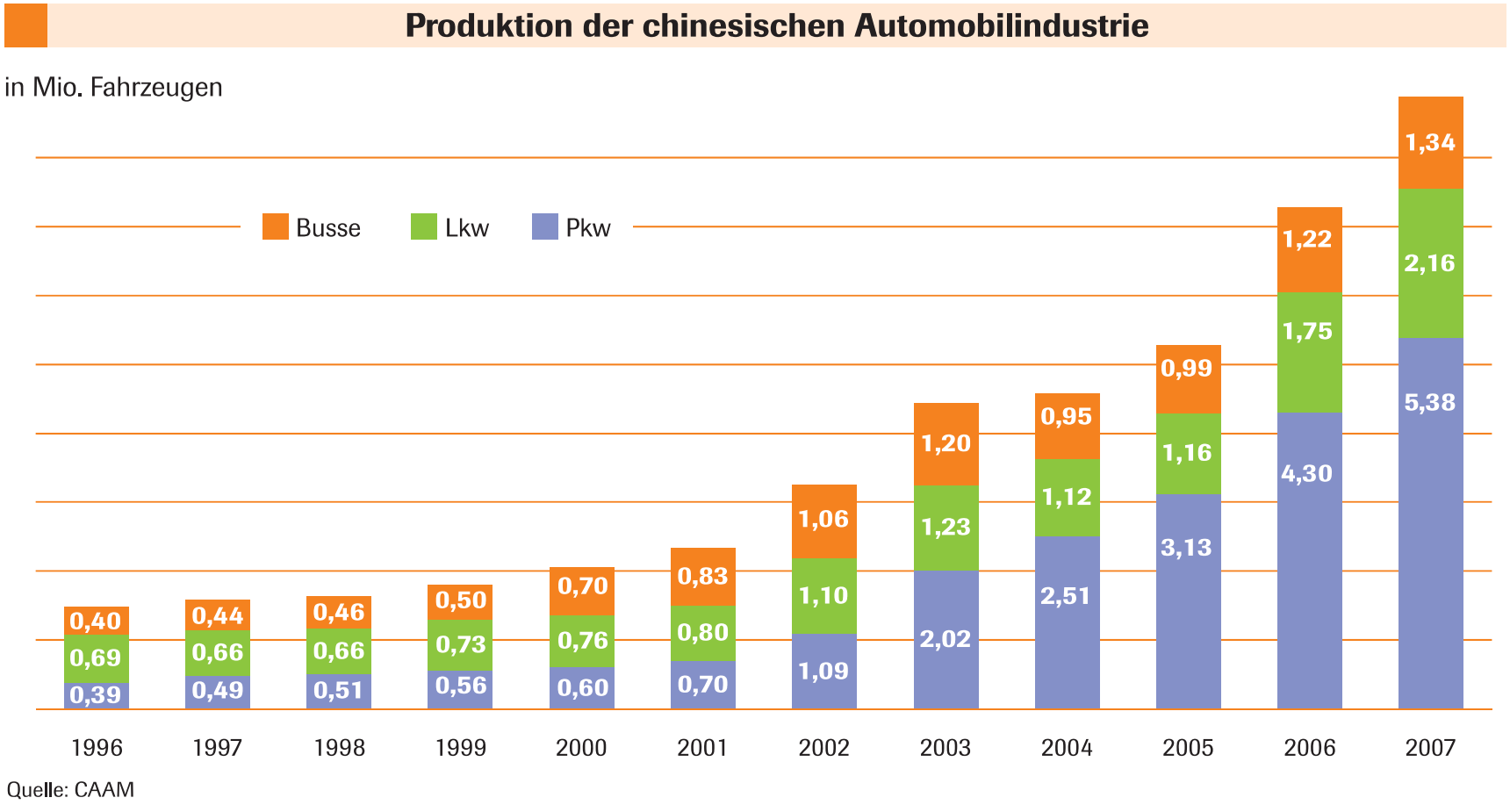


Emerging Market Share of Global Passenger Car Demand



Quelle: F.A.Z.

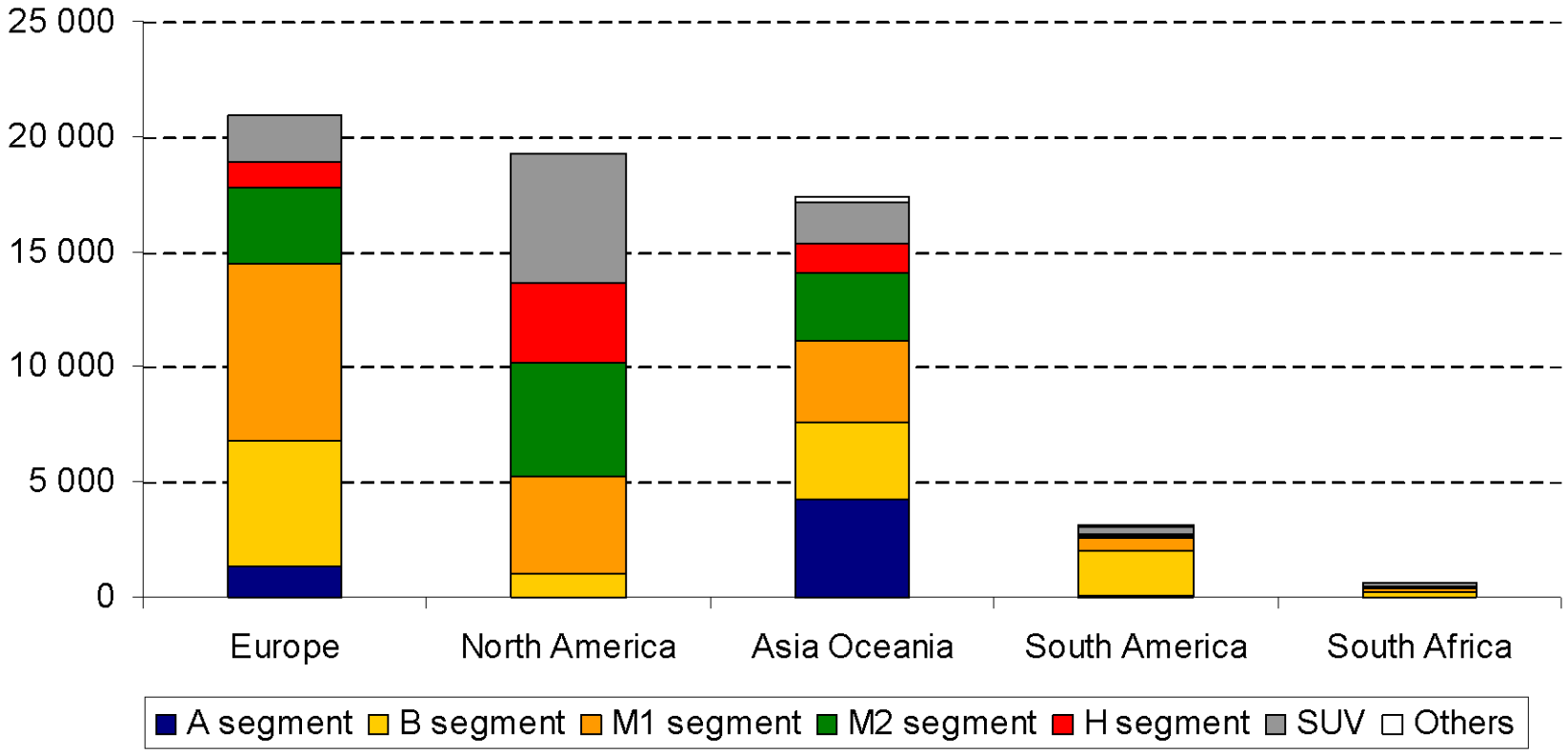
Automobile Production in China



Off Shore Production of German Passenger Cars 2006-2007

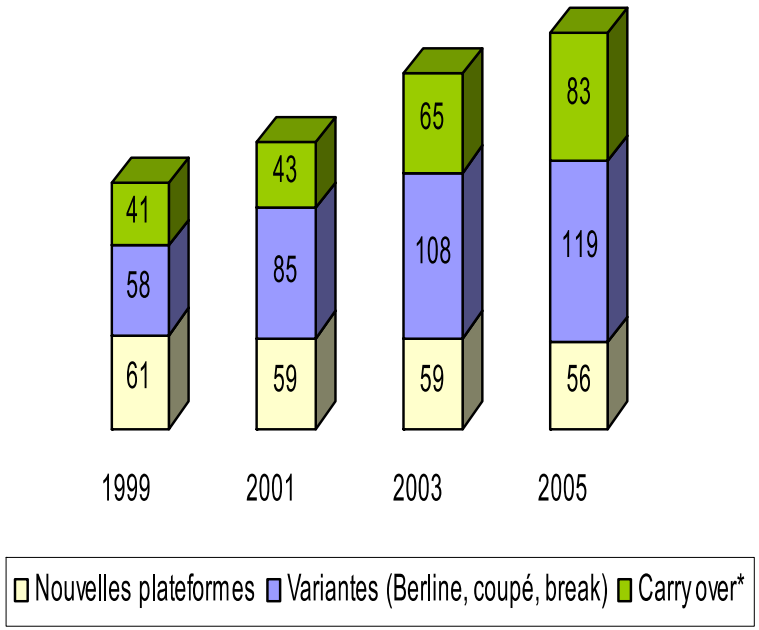
6%

Global production along with increasing variety & models: Constant change, uncertainty, need for flexibility in production



Global production along with increasing variety & models: Constant change, uncertainty, need for flexibility in production

Graph 10: Number of variants, new platforms and carry over* in the world (units)



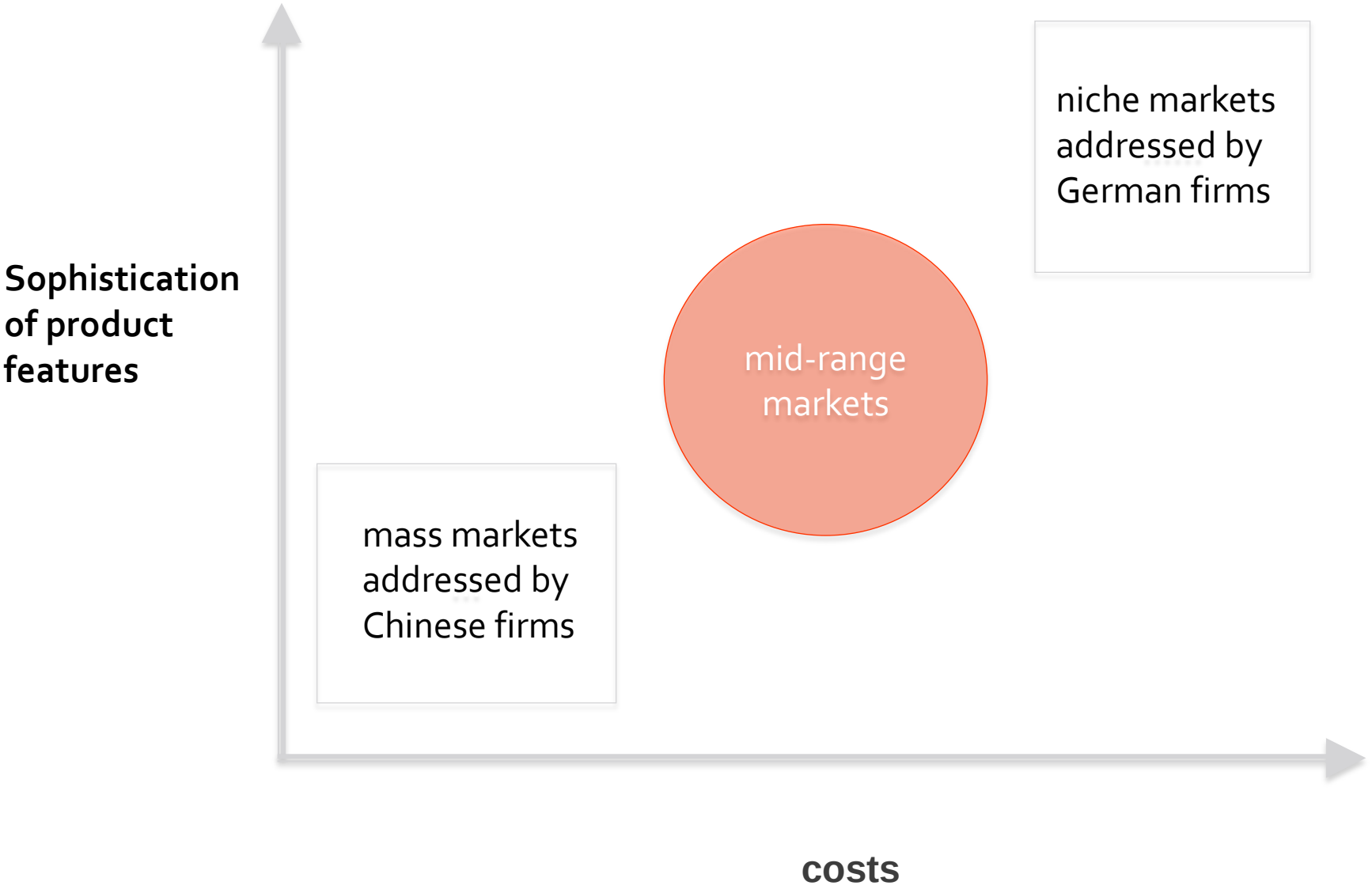
Source: C. MIDLER, Polytechnique 2006 and Mc Kinsey, 2006

*** Carry over: new models as regards existing platforms**

Changing Firm Global Product & Production Strategies: Increasing Sophistication

- Investments in all markets involves sophisticated manufacturing.
  - Not (only) verlängerte Werkbank (capacity subcontracting)
  - Aim is either to have products with same quality all over the world or to claim a position in local market that emphasizes quality of design and manufacture relative to local competitors
  - Adaptation to local market tastes/regulations requires development of engineering, design and skilled workers production capability in all markets

Typology of Chinese markets (automobiles and mechanical enginnering)

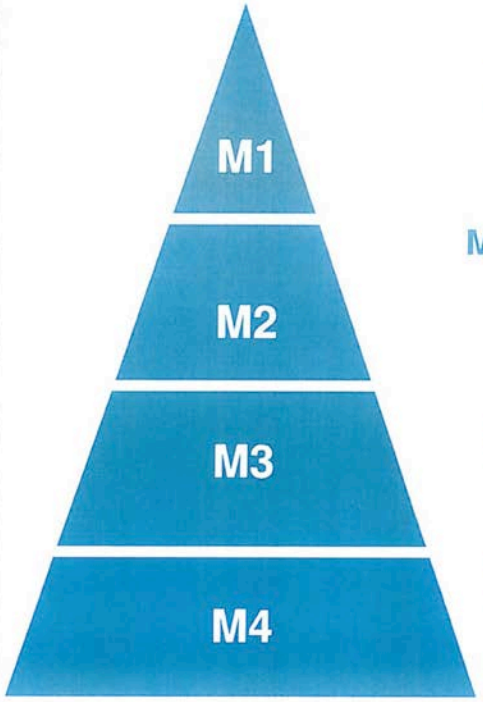


Basic/Standard Market: Industrial Power Drives

DT has defined its M1-M4 market segments

Not part of market evaluation process (MEP) 2011

Market dimensions – SMART (1/2)



Characteristics

High-End Market
- Global customers
- Technology leadership, highest flexibility
- Most advanced features and performance
- Focus on 'Total Cost of Ownership'

Mid-Range Market
- Global / regional customers
- High technology and advanced features / functional range
- All international standards available

Basic/ Standard Market
- Mostly local customers with local and international focus
- Standard technology, limited features
- Low price

Low-End Market
- Mostly local customers with local focus
- Cheapest 'bulk'-type product range
- Basic functionality, standards not in focus
- Focus on cheapest price through any measures incl. copying and used parts

Regions in focus
- China
- India
- Brazil
- Russia
- Middle East

Additional countries on special request only

Step Two

- New Multinationals
- New Forms of Interdependent/Recursive Governance

Technology Transfer : Problems, dynamics and mechanisms

- Problem: maintain quality, duplicate product advantages, allow for local discretion
- Varieties of local discretion
  - Adapt to local consumer tastes and standards for durability and performance
  - Accommodate local regulations and standards in product design & materials
  - Adapt to local materials and supplier capabilities
  - Take advantage of variation in production induced by local cost differences (less automation, less stringent standards, more integration/less integration of component production depending on supplier availability, capability and in house costs and abilities)

Technology Transfer : Problems, dynamics and mechanisms

- Affected functions
  - Product design
    - New design
    - Adaptational engineering
  - Proto-typing
  - Production technology
  - Work organization
  - Component sourcing
  - Material sourcing

Limits to Hierarchical Command Based Governance & Rise of Corporate Production Systems

- Uncertainty, Innovation and Continuous change (model variety, innovation, local tastes & practices) make old style hierarchical Principal-Agent governance ineffective
  - No fixed role positions, unclear interests—hard to align incentives
  - Cooperation across hierarchies and locations, iterative joint goal setting more effective
  - Global problem (not specific to China or emerging markets)

- One emergent solution: Corporate production systems
  - Bottom-up, stakeholder involvement principles: Joint goal setting, regular performance review, on-going optimization and recomposition
  - Formal communication, transparency: writing things down, taking pictures
  - Metrics, benchmarks, gates—tools for the identification of problems and inducing collective reflection on joint practices

CPSs: Experimentalist Logic (Sabel & Zeitlin ~ Dewey)

- CPSs are formal self-monitoring systems that combine joint goal setting between center and subsidiary with local discretion in subsidiary production locations

- Experimentalist Architecture: Global products/standards→Local discretion→Justification→Revision of Global Products/standards

Institutional Carriers diffusing Experimentalism: CPS's Induce Organizational Learning

- Centers of Competence (Getriebe)
  - Exporters/Monitors of specialized competence and learning
  - No compromise on quality
  - Tolerate local discretion & innovation
  - Key role of expert judgment
  - Informal recursivity
- Continuous Improvement Teams (Turbo-Antrieb)
  - Technological transfer by lean ideologues
  - Obsessive linkers of players in different locations but producing same/similar product
  - Institutionalization of all-way knowledge flow
    - taken for granted recursivity
- Individualized transfer: Tuftlern, lonely Russian technicians traveling the world (Holzmaschinen)
  - Informal knowledge
  - Randomized but extensive localization
    - Improvisation to get things working
  - Informal recursivity
    - Little formal authority
- Cookbooks

Experimentalism induced learning is globally recursive within MNCs and across supply chains

- Global challenges/tasks as mutual learning opportunities
  - Multiple simultaneous and interactive processes:
    - organizational optimization (production, work, tech transfer)
    - tech optimization
    - product innovation
- Company-wide governance structures monitor, coordinate and optimize interacting plants (teams) in multiple countries
  - Regular meetings of managers and teams
  - Systematic global knowledge leveraging
- Recursive learning becomes systematic and multivalent

Step Three

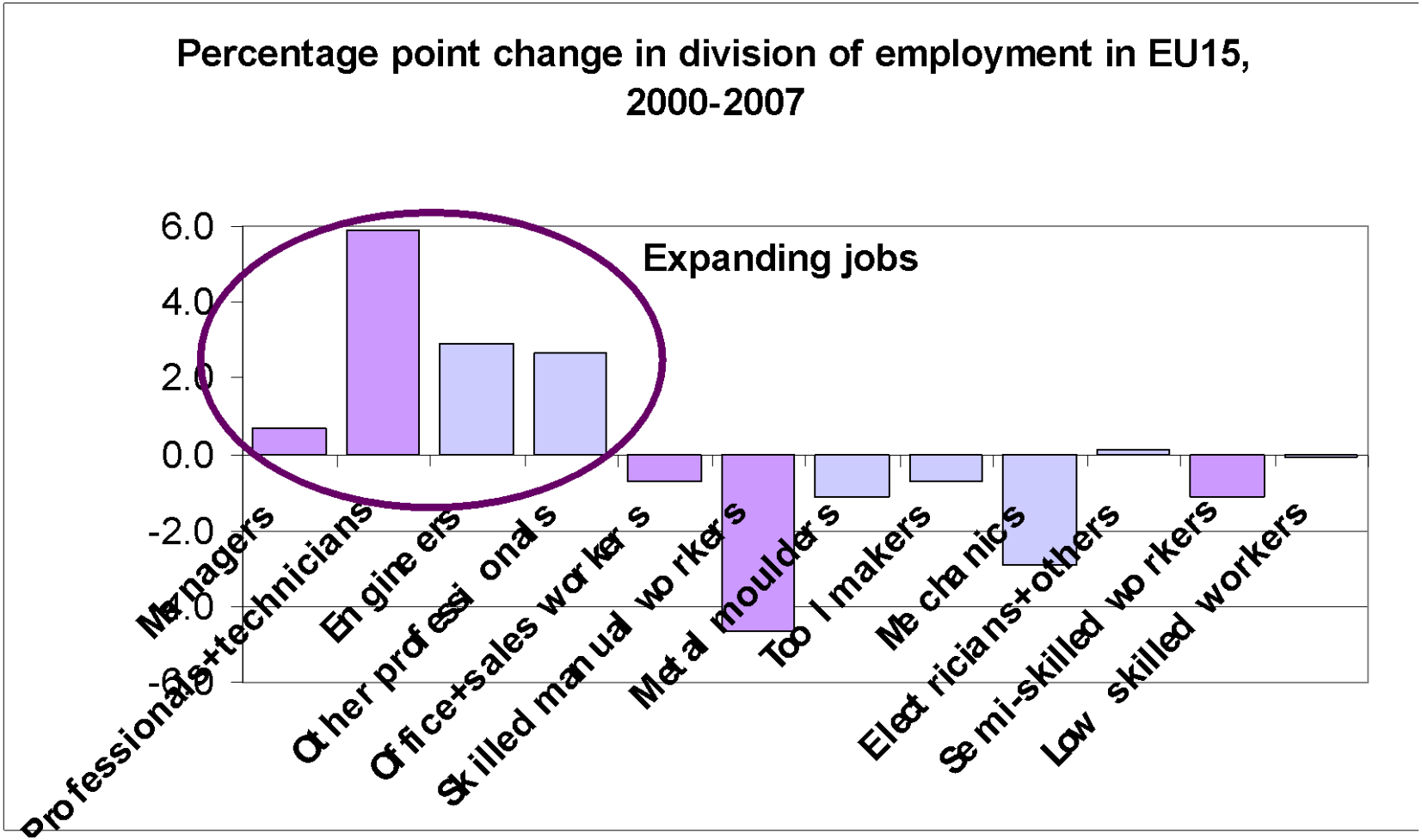
- Consequences for the Home Country
- Global Nation States
- Transgression of Many Old Categories

Consequences for German Production Locations & Firm Governance Practices

- Re-allocation of competences
  - More production in foreign markets relative to home/European markets
    - Localization of design, production and sourcing
  - Shrinkage of production workforce in home market
    - Servicing of more slowly growing demand
    - Continued linkage of production & product development
      - Despite global reallocation of competences, production viewed as indispensible contributor to value creation
  - Expansion of technician and engineering workforce in home market
    - Global product development
    - Global product adaptation support
    - Home market product development

Engineering Employment Growth

Competence re-allocation



Consequences for German Production Locations & Firm Governance Practices

- Paradox: Localization logic acts as brake on loss of home employment
  - Produce where you sell also true of European market
- But possibilities for segmentation are emerging
  - Low(er) wage production in supply chain
    - Eg Albstadt, Neckarsulm etc
  - Dilemma for Works Councils
  - Dilemma for Trade Unions
    - Non tariff firms
    - Provide jobs that would otherwise migrate to MCE

General questions regarding Co-determination and Industrial Relations

- What is the relationship between emergent recombinant stakeholder representation and pre-existing class based stakeholder/co-determination conceptions/institutions?
  - The former transgress, the latter entrench the property boundaries
  - The former continuously recast roles, the latter protects them
- Works councils and Corporate Production Systems
  - Eg ZF, SEW (promising); Siemens-Flender (negative?)
- Union strategies for dealing with upgraded German workforces
  - Engineers and designers in IG Metall? etc

Consequences for German Production Locations & Firm Governance Practices

- General Questions for Regional Industrial Policy
  - Taking globalization seriously: Policies for supporting the new global practice rather than retaining the practices that are increasingly being abandoned
  - Questions of stakeholder involvement in regional upgrading
    - Eg Neckarsulm- Heilbronn—Baden Wuerttemberg; NRW?
      - IG Metall & Non Tariff bound firms cooperate in regional policy development (in addition to the "normal" parties/relations)
- General Questions for National Industrial Policy
  - (?)