

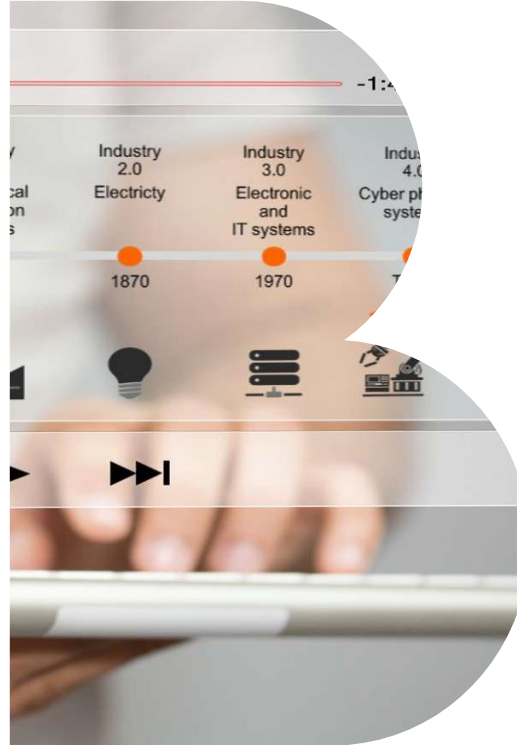
# The Industrie 4.0 transition

*How it reshuffles the economic, social and industrial model*

World Manufacturing Forum

Max Blanchet

April 2016



# Industrie 4.0 : impacts & enablers

**A.** Impact : a new economic and industrial model

---

**B.** Stake : a nationwide imperative for industrial countries

---

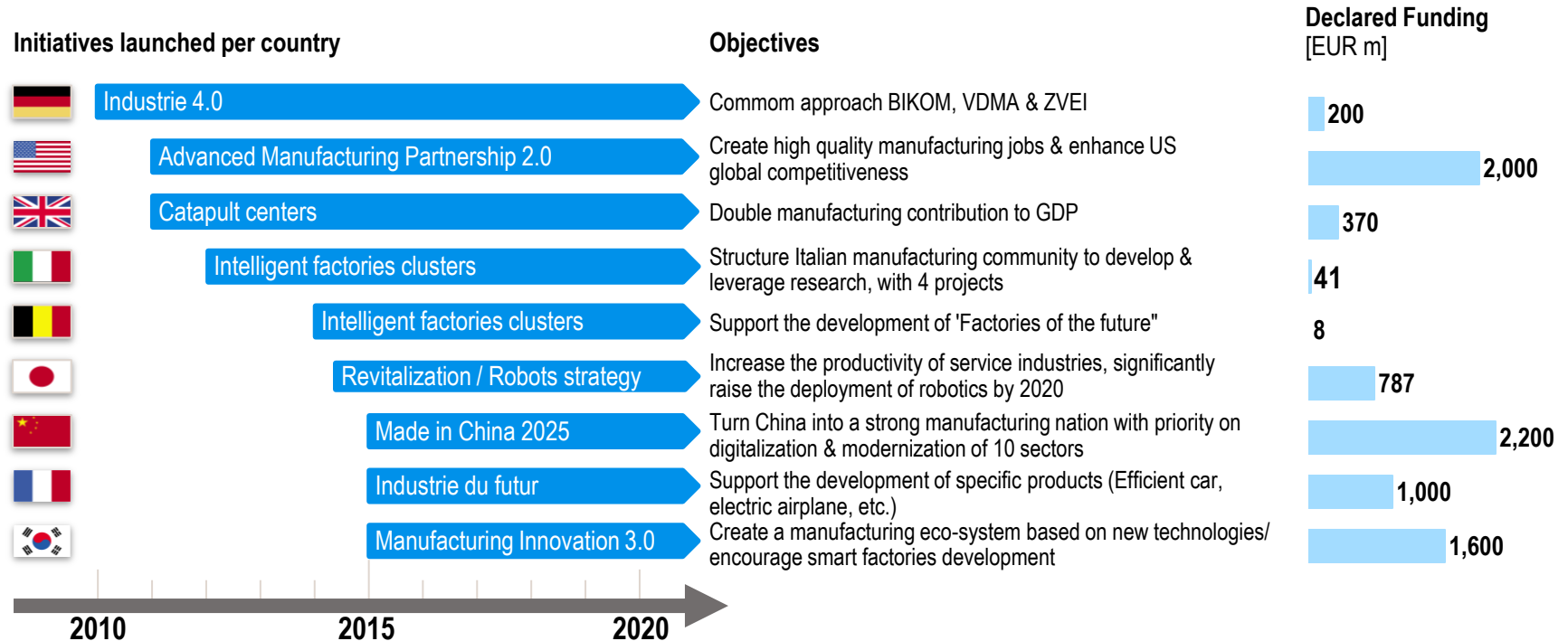
**C.** Enablers & anticipation

## A. Impact : a new economic and industrial model



# All countries have launched Industrie 4.0 initiative, Germany and US first, followed by China, Japan and rest of Europe

## Worldwide initiatives & related investment announced



# Industrie 4.0 is changing the paradigm of manufacturing strategy

## Characteristics of new Industrie 4.0

1	FROM MASS PRODUCTION TO <b>MASS CUSTOMIZATION</b>	Flexible production, short production lead time enabling new business models emergence and affordable customization
2	FROM VOLUME SCALE EFFECT TO <b>LOCALIZED &amp; FLEXIBLE UNITS</b>	From large factories specialized per product in LCC to smart factories with high technological equipment enabling to produce at competitive cost everywhere
3	FROM PLANNED MAKE TO STOCK TO <b>DYNAMIC MAKE TO ORDER</b>	From an organized production, based on planning and forecast and supported by stocks, to dynamic production and yield management, on demand
4	FROM PRODUCT TO <b>USAGE</b>	Integrated conception, services being a key element of the business model/ decision factor
5	FROM COST DRIVEN TO <b>ROCE DRIVEN</b>	Higher ROCE for lower Capital employed as complexity is transferred on numeric
6	FROM TAYLORISM TO <b>FLEXIBLE WORK ORGANIZATION</b>	Remote work (augmented reality, permanent connectivity), Tasks parallelism, flexible organization and management
7	FROM HARD WORKING CONDITIONS TO <b>ATTRACTIVE WORK SPACE</b>	Development of complex artisanal production, with clean/ highly connected work space, white collars intensive

# Most industrial players have launched Industrie 4.0 pilots to test those solutions in legacy plants

## Automated plant



## Collaborative robotics



## Conditional maintenance



## Humanoid robotic



## MOST INDUSTRIE 4.0 TECHNOLOGY BRICKS ARE EXISTING

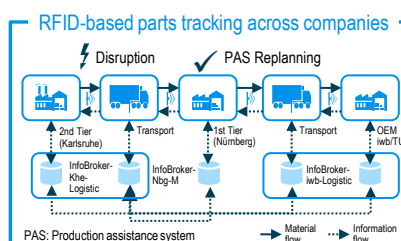
## Intelligent logistic bins



## 3D printing



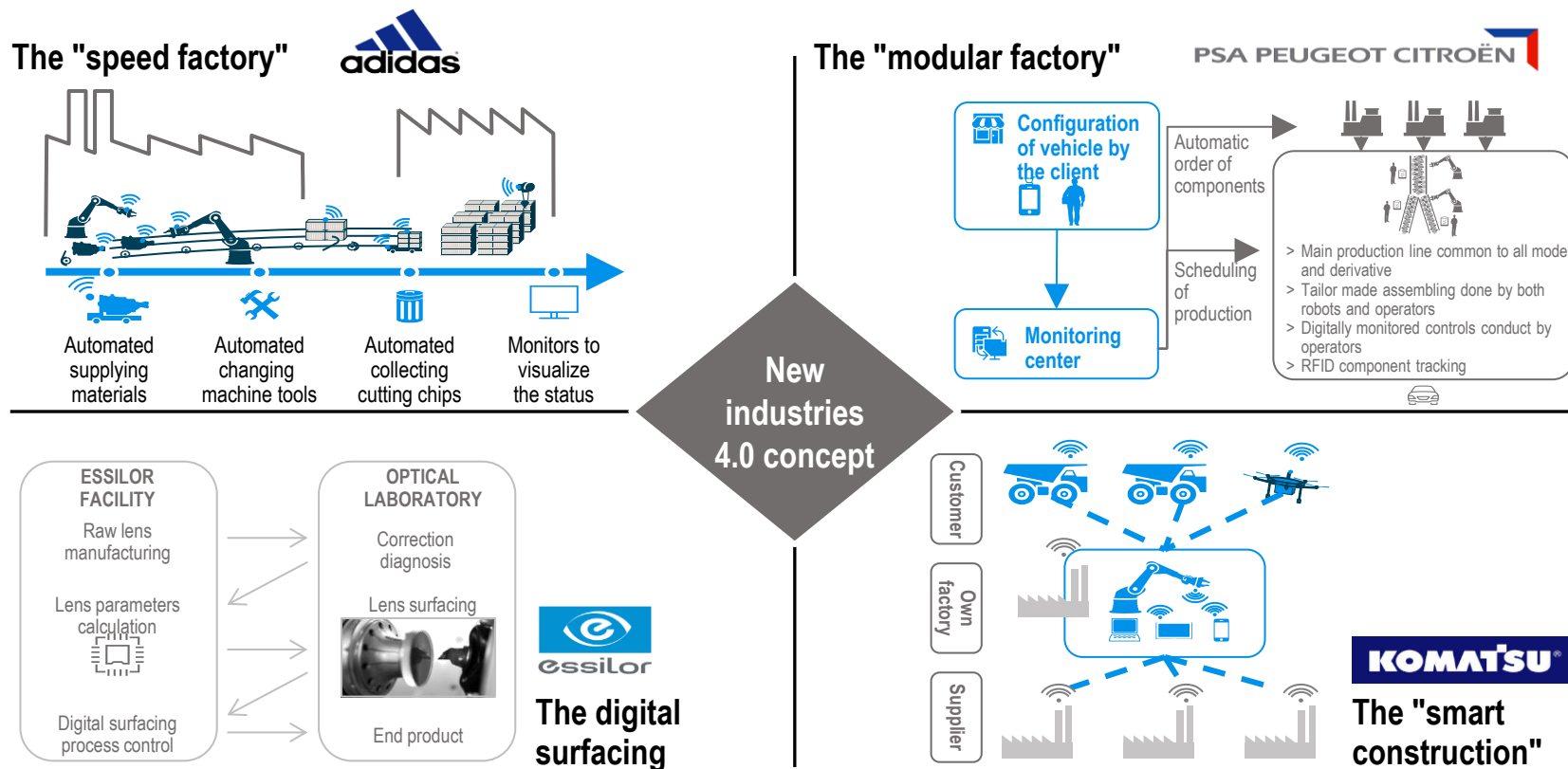
## RFID logistics



## Augmented reality



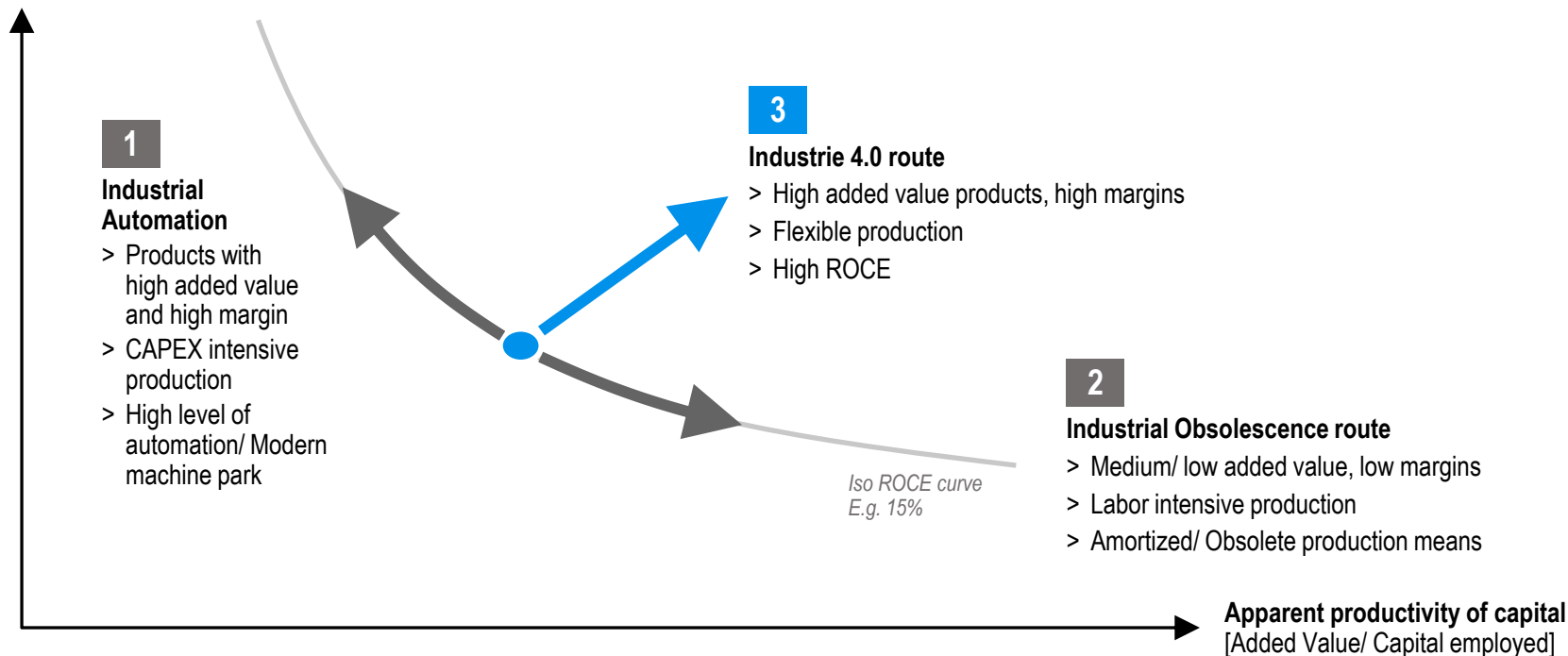
A few projects and concepts are emerging and looks extremely promising



# Industrie 4.0 is creating a new route towards lighter capital intensity and increased value

Iso ROCE curve

Profitability index [EBIT/ Added Value]



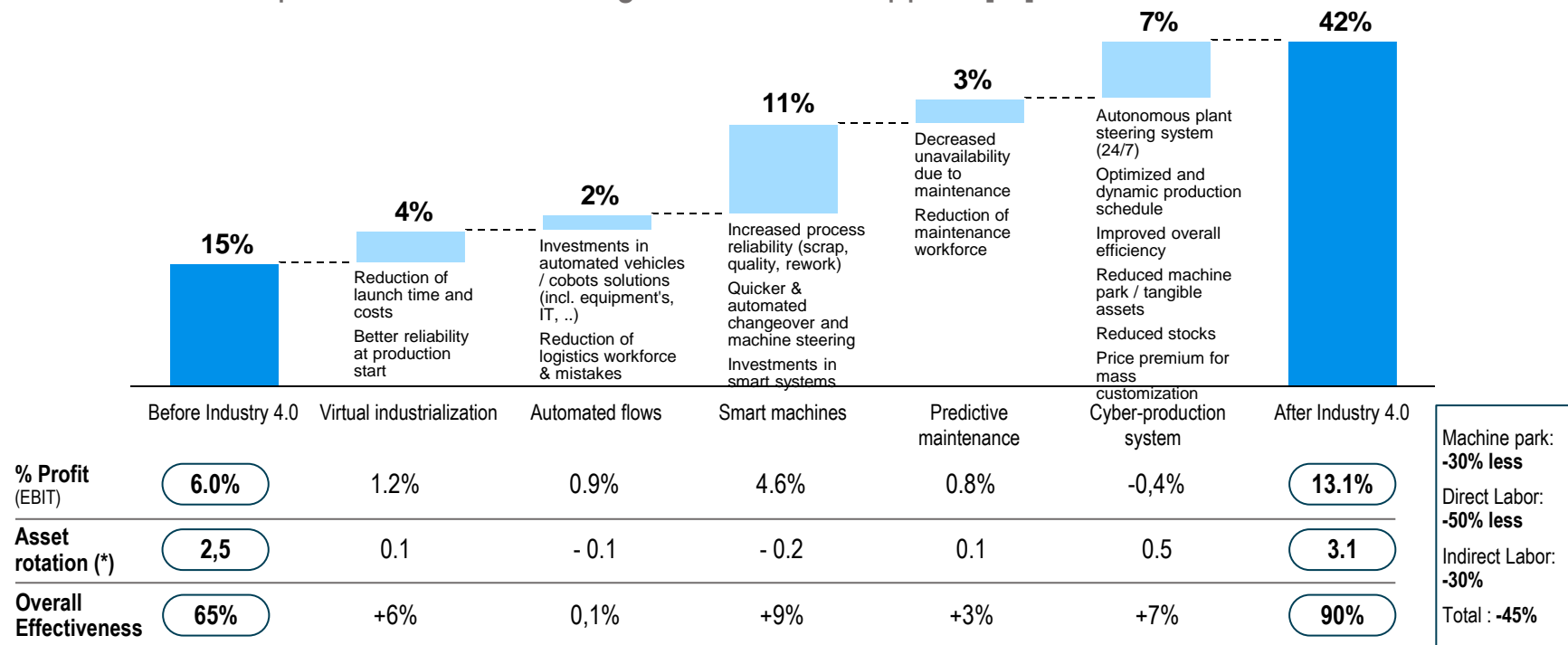
Capital employed : economical assets (fixed assets & working capital need)

Source: Brokers, Roland Berger analysis

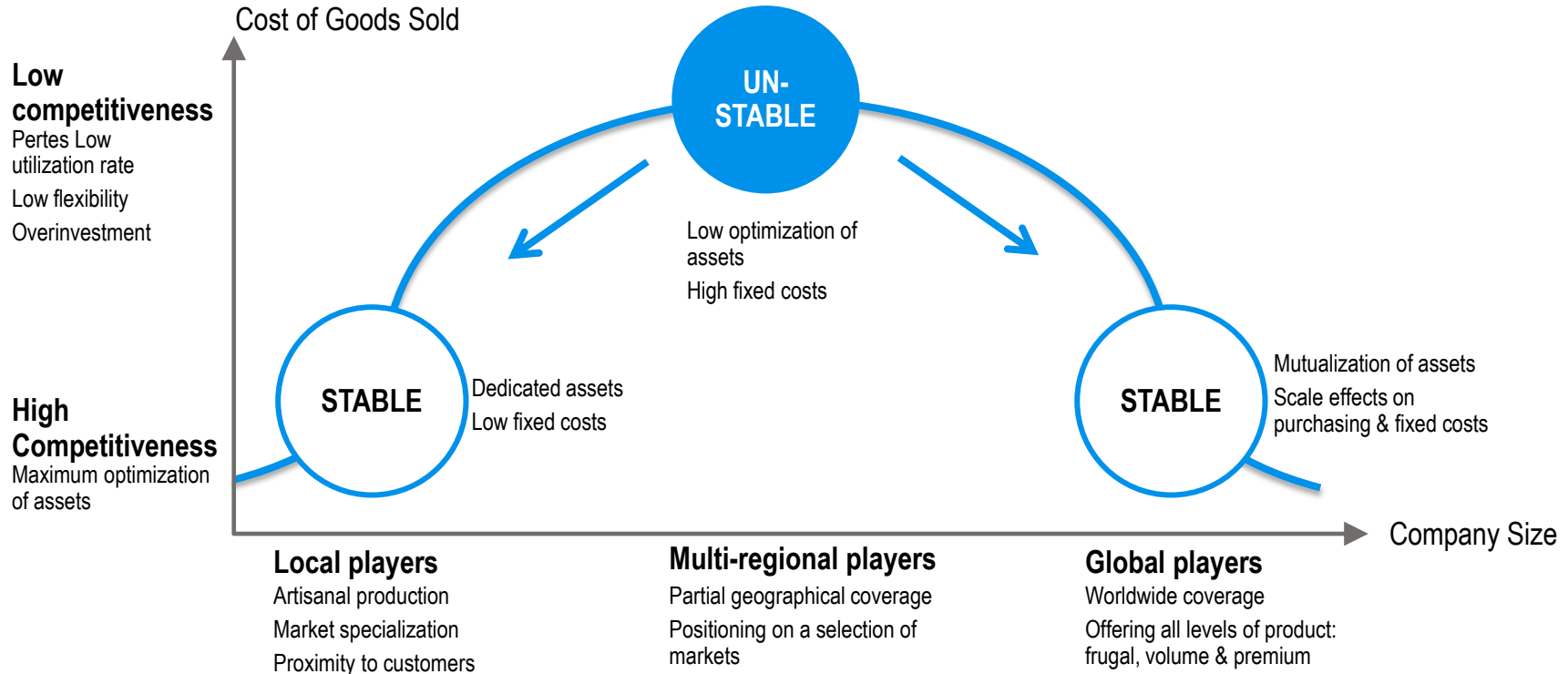


# Industrie 4.0 allows to reduce capital employed utilization and increase profit, thus strong impact on ROCE

ROCE evolution per lever for an average Tier-1 Auto supplier [%]



# Industrie 4.0 will encourage the development of local players with artisanal style competing with large firm – dilemma in the middle

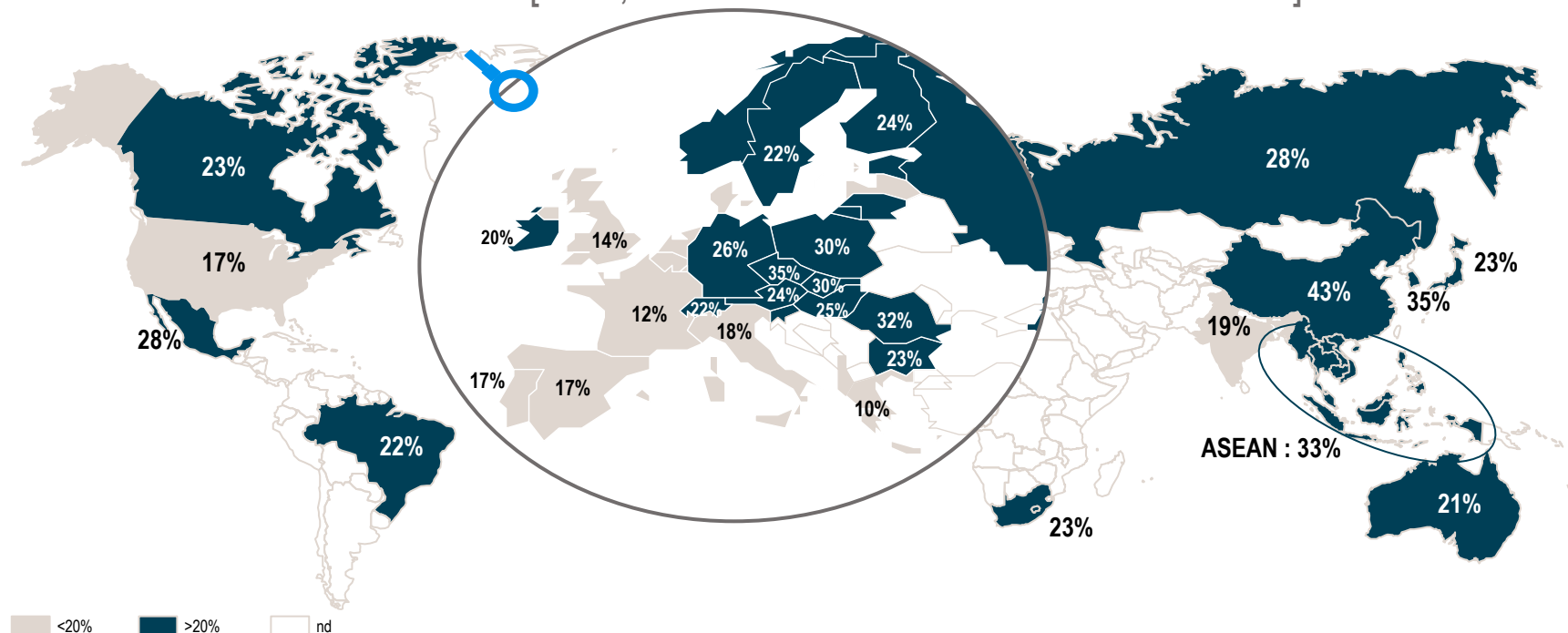


- B. Stake : a nationwide imperative for industrial countries



The last 30 years deindustrialization have created a deep cleavage among countries with regards to the importance of the industry

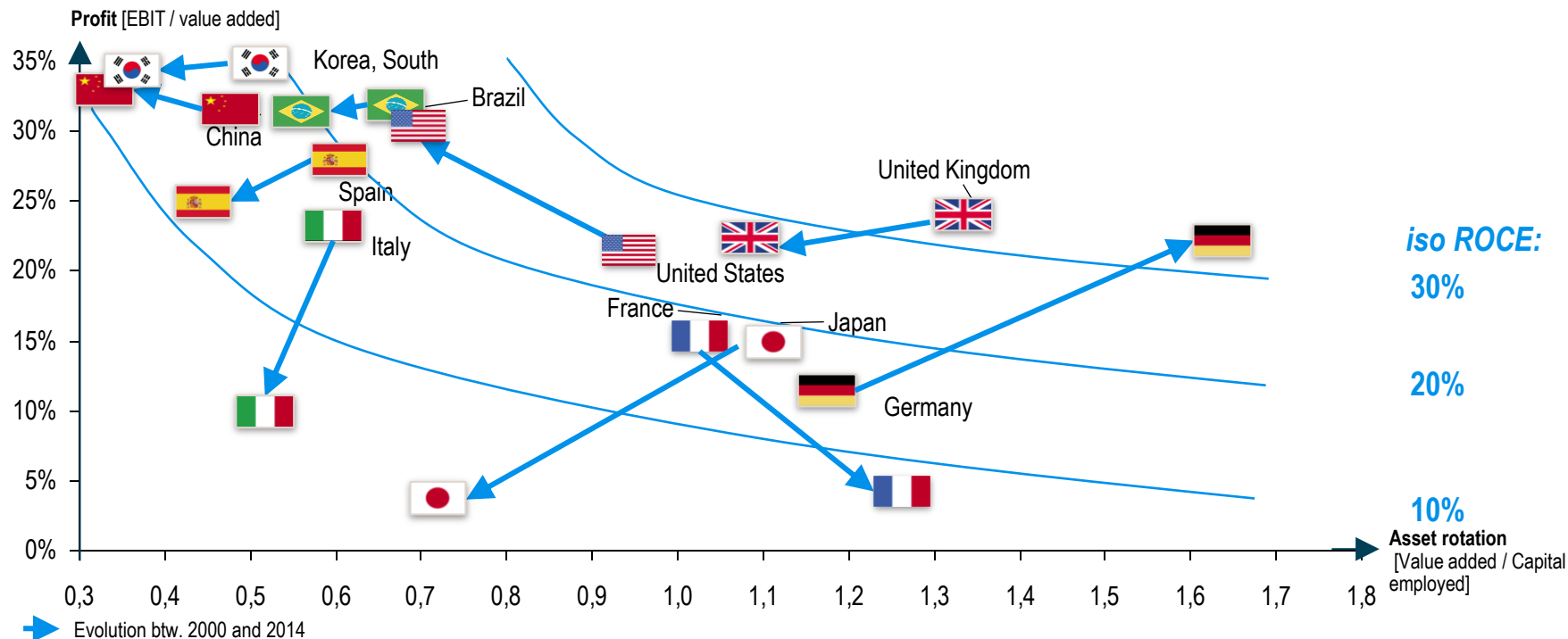
Industrial<sup>1)</sup> share in added value [2014; Industrial added value/ Total added value]



1) Including manufacturing, utilities, mining and quarrying  
Source: UNCTAD, Roland Berger analysis













As a result, ROCE is swinging across countries - Except for Germany and the US, industrial ROCE decreased in most countries

Positioning of main industrial countries on profitability iso-curve [2000-2014]



# Industrie 4.0 is an opportunity to revitalize rational industry

## Rationale for Industrie 4.0 – Top 3-4 critical rationales for each country

	<b>MAINTAIN ADDED VALUE THROUGH COMPETITIVENESS</b>	Lower labor sensitivity / Improve competitiveness Create entry barriers	
	<b>RELOCALIZE INDUSTRY VIA NEW BUSINESS MODELS</b>	Produce personalized products at mass production cost	
	<b>GAIN GLOBAL LEADERSHIP IN 4.0 SOLUTIONS</b>	Develop technologies & standards Create an export solutions	
	<b>INTERNATIONALIZE AT LOWER RISK</b>	Flexible production lines to reduce demand changing need Decrease capital cost of geographical expansion	
	<b>ENHANCE DIGITAL START UPS &amp; ECOSYSTEMS</b>	Create platform to enable ecosystems Accelerate innovation via incubators clusters	
	<b>INCREASE EMPLOYEES SATISFACTION AT WORK</b>	Reduce pain point at work Increase meaning of work	
	<b>IMPROVE SUSTAINABILITY AND IMAGE</b>	Reduce use of natural resources Improve image of the industry	

## **C. Enablers & anticipation**



# Getting prepared requires to address key challenges

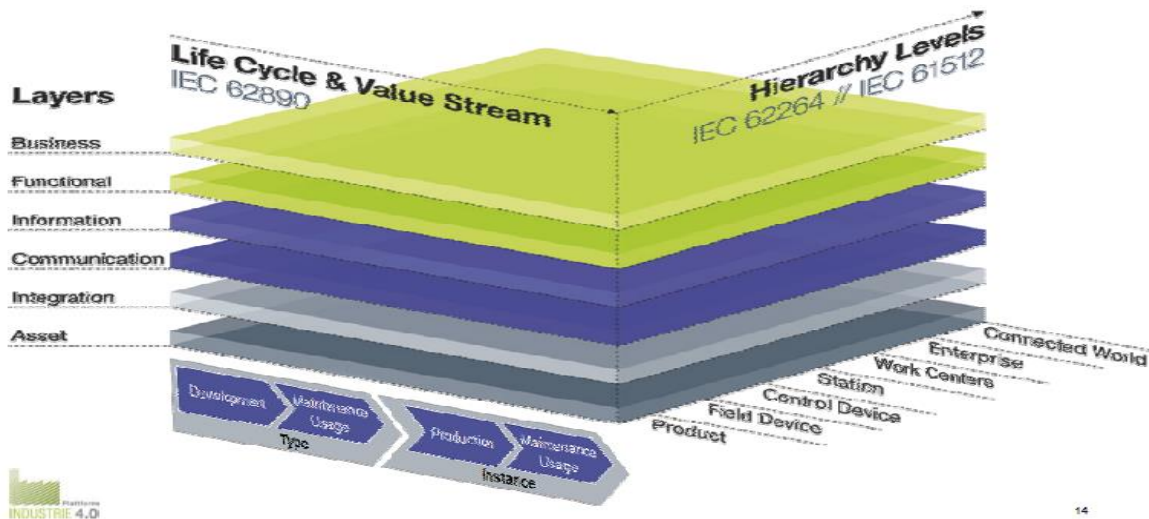
## Risks / Challenges Industrie 4.0

	<b>COMMON PLATFORM INFRASTRUCTURE</b>	Common infrastructure enabling communication vertically / horizontally and throughout development
	<b>COMPETENCES DEVELOPMENT</b>	New competencies emerging : data scientist, developers, data managers, etc. Education of people at all level
	<b>LABOR FLEXIBILITY</b>	Flexible labor environment Entrepreneurial contract
	<b>SKILL EVOLUTION</b>	New qualification of tasks (new tools, tasks and methodologies) Evolution of jobs : less repetitive tasks, more client oriented tasks
	<b>CYBER SECURITY</b>	Ensure protection of data and technologies
	<b>LEGAL &amp; STANDARDS ENVIRONMENT</b>	Create standards/ norms to support disruption Develop common infrastructure (5G, ..)




















# The RAMI4.0 initiative from the German platform 4.0 needs to be an open approach

## Reference Architecture Model Industry 4.0 (RAMI4.0)



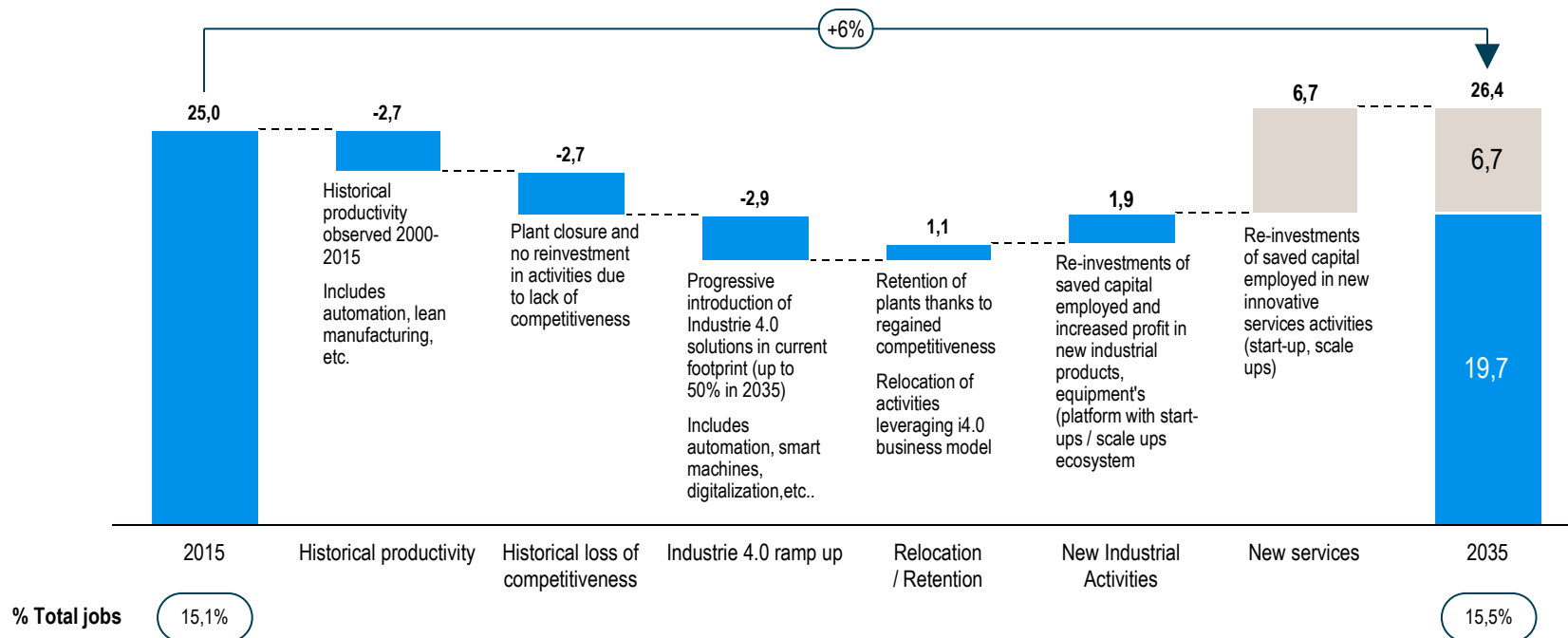
- > Functional equivalence
- > Interoperability
- > Platform independence
- > Secured
- > Scalable
- > Comprehensive information modeling: for defining complex information
- > Allowing simple and complex system
- > On-demand

# Key principles of the new economical model

New drivers	Employment drivers				
	INDUSTRIE 3.0	INDUSTRIE 4.0		INDUSTRIE 3.0	INDUSTRIE 4.0
Volume of products			Manufacturing volume growth		
Cost			Manufacturing productivity		
Usage cost			Development of services		
Capital employed			Relocation		
Margin			Usage development		

# Employment destruction / creation in Europe following Industrie 4.0 implementation in 2035

Industrie job destruction and creation[millions, Western Europe]



Roland  
Berger

