Innovation in logistics: advanced pooling and robotization

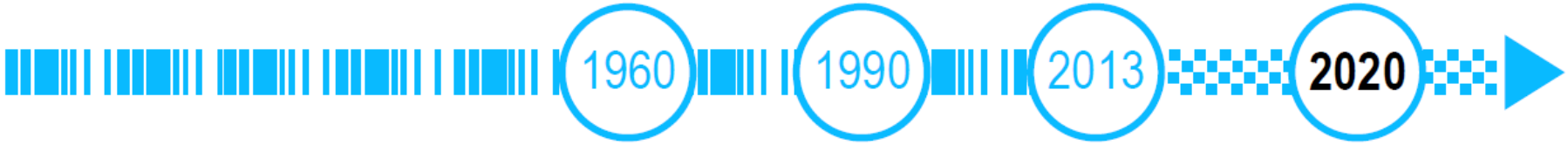
Speech by Artem Zakomirnyi

ЕЖЕГОДНЫЙ МЕЖДУНАРОДНЫЙ
SUPPLY CHAIN & LOGISTICS FORUM

Moscow, May 2016

Cheaper, lighter, faster – how far can logistics still improve ?

Evolution of logistics performance indicators



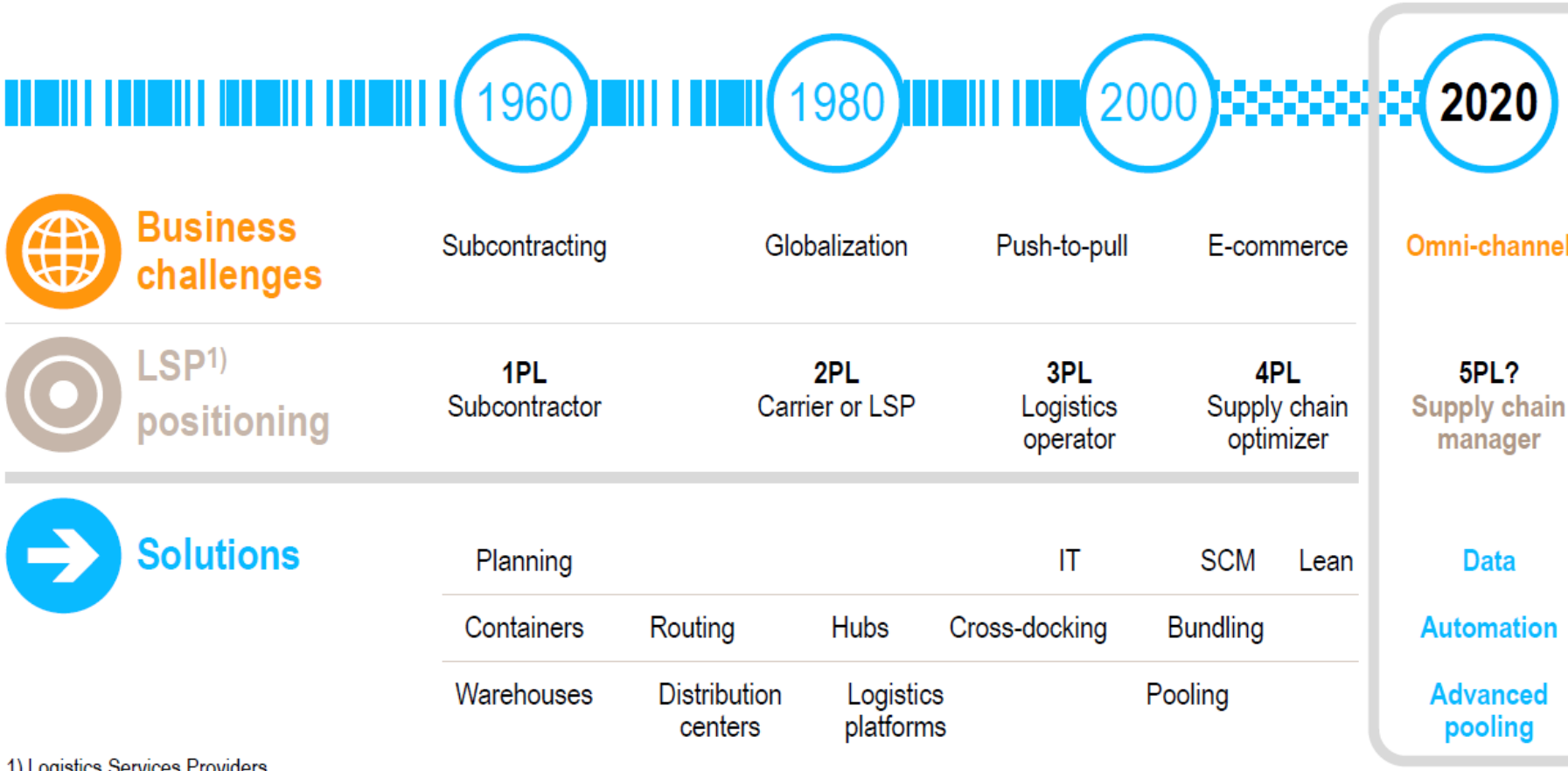
	1960	1990	2013
Cheaper US Logistics Costs [% GDP]	>15%	11%	8%
Lighter US Inventory Value [% GDP]	>30%	18%	14%
Faster EU Order Lead Time [days]	30	<20	<10

what's up next?

Source: BEA, EU, CSCMP, Roland Berger analysis

Next generation logistics solutions are underway

Evolution of logistics solutions



1) Logistics Services Providers

Source: Roland Berger analysis

3 areas to explore : advanced pooling, automation and data

ADVANCED POOLING

Companies are still looking for logistics scale effects :

Deliberately:

> **internally** through the merger of distinct sales channels logistics into one consolidated **"omni-channel"**

> **externally** through a logistics **pooling** managed by a LSP for multiple vendors

Constrained:

> **on a local scale** through unique **urban logistics operators** selected by cities

> **on a global scale** by e-commerce leaders repositioning themselves as **LSP for third parties**

LSP Logistics Services Providers

AUTOMATION

Automation's relevance is growing stronger due to the fragmentation of orders, multiplication of SKU and reduction of investments required for warehouse automation **– but its cost remains prohibitive for now.**

The solution may lie in robotization – a "flexible" alternative to large automated infrastructures

DATA

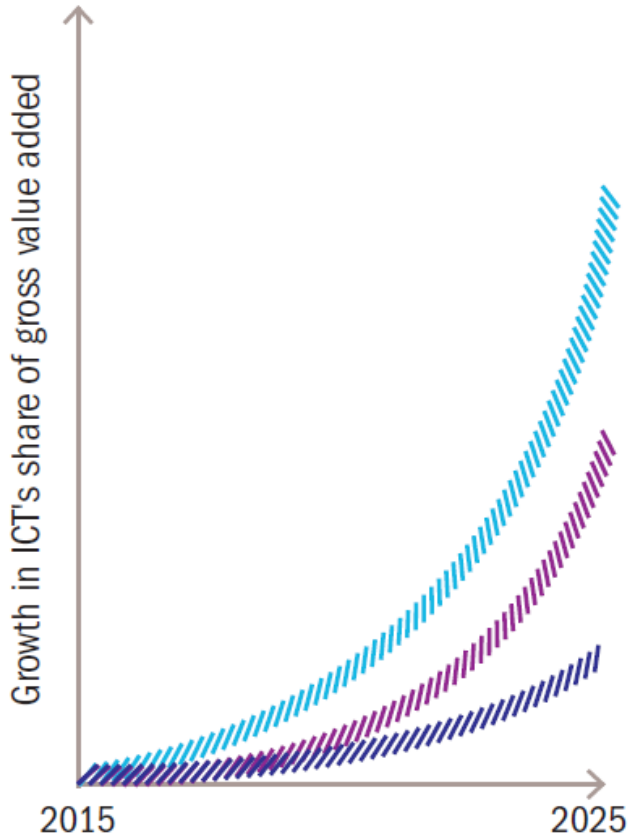
The right product at the right time at the right place – **for now, logistics has mainly been used to overcome the lack of reliable forecasts.**

"BIG DATA" holds unprecedented perspectives for LSP through the leveraging of both internal AND external data to optimize the supply chain

Source: Roland Berger analysis

Why being bothered? – Logistics industry will be exposed more and faster to digitization than other industries

Non-reaction might lead to overall market losses in the order of ~EUR 605bn



	Change in ICT's share of GVA in 2025, relative to 2015	Potential losses through 2025 (cumulative)
Wave 1	+ 17% points Disruptive to serious impact on entire industry	Automotive, logistics EUR 350 bn in GVA[1)]
Wave 2	+ 10% points Serious to moderate impact on individual segments	Medical technology, electrical engineering, mechanical/plant engineering, energy systems EUR 215 bn in GVA[1)]
Wave 3	+ 5% points Evolutionary to minor impact	Chemicals, aerospace EUR 40 bn in GVA[1)]

1) Information and communication technology; 2) Gross value-add of the industry in EU-15 countries plus Norway and Turkey

Source: 'The digital transformation of industry' – E European study commissioned by the federation of German industries (BDI) and conducted by Roland Berger Strategy consultants

Disruption comes from the new market players

Example of logistics startups

> **70** companies screened

> **~80%** founded after 2011

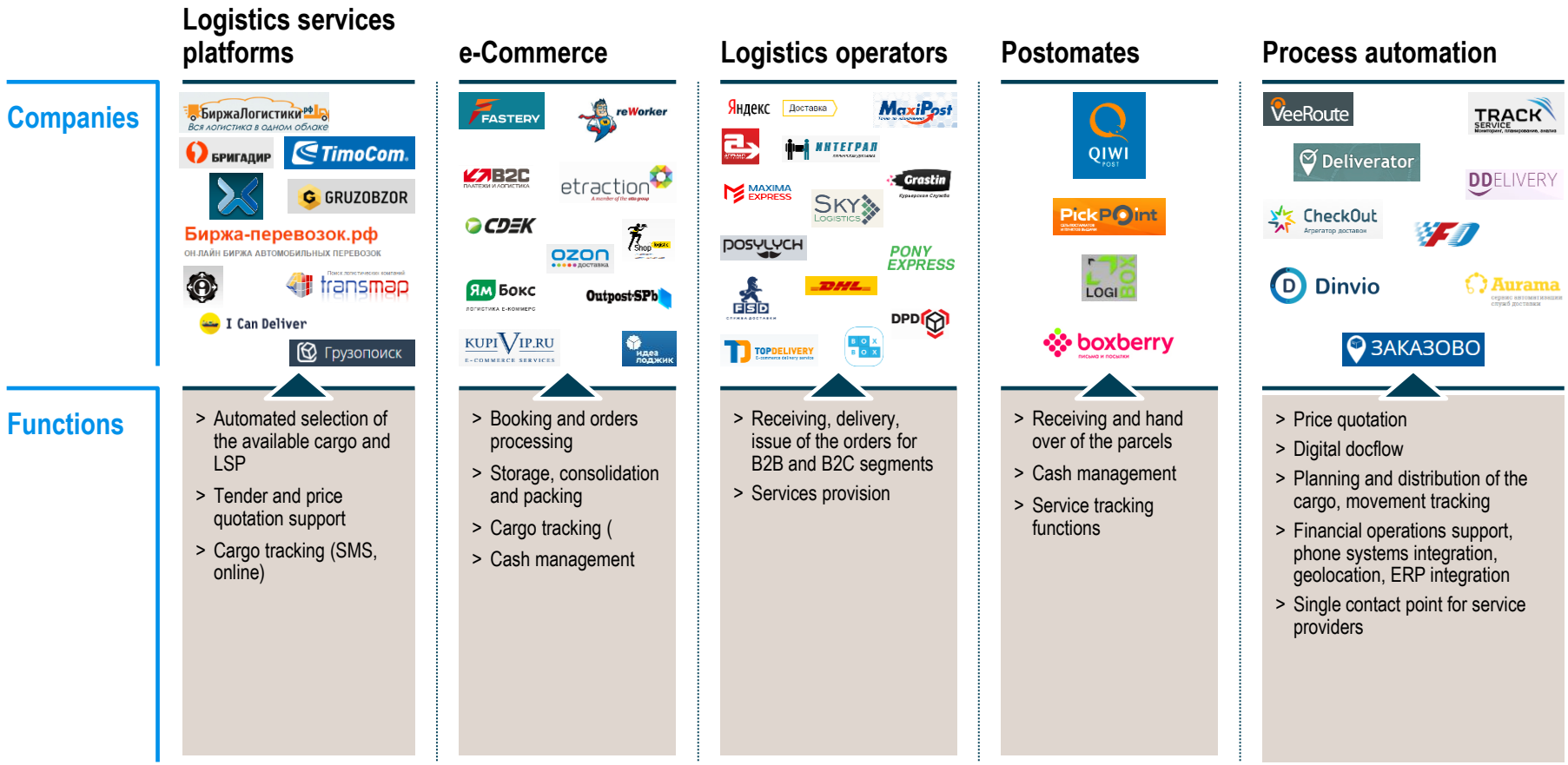
> with funds raised of **EUR 200-300 m** in total during the last 5 years

> Mainly located in the **United States**

Source: Interviews, Roland Berger analysis

Russia as well experiences the period of growing interest for an innovative solutions in logistics

Examples of the Russian companies in the innovative logistics domain



Source: Roland Berger

Our experience of logistics start-ups supports crystalized several success factors of the platform

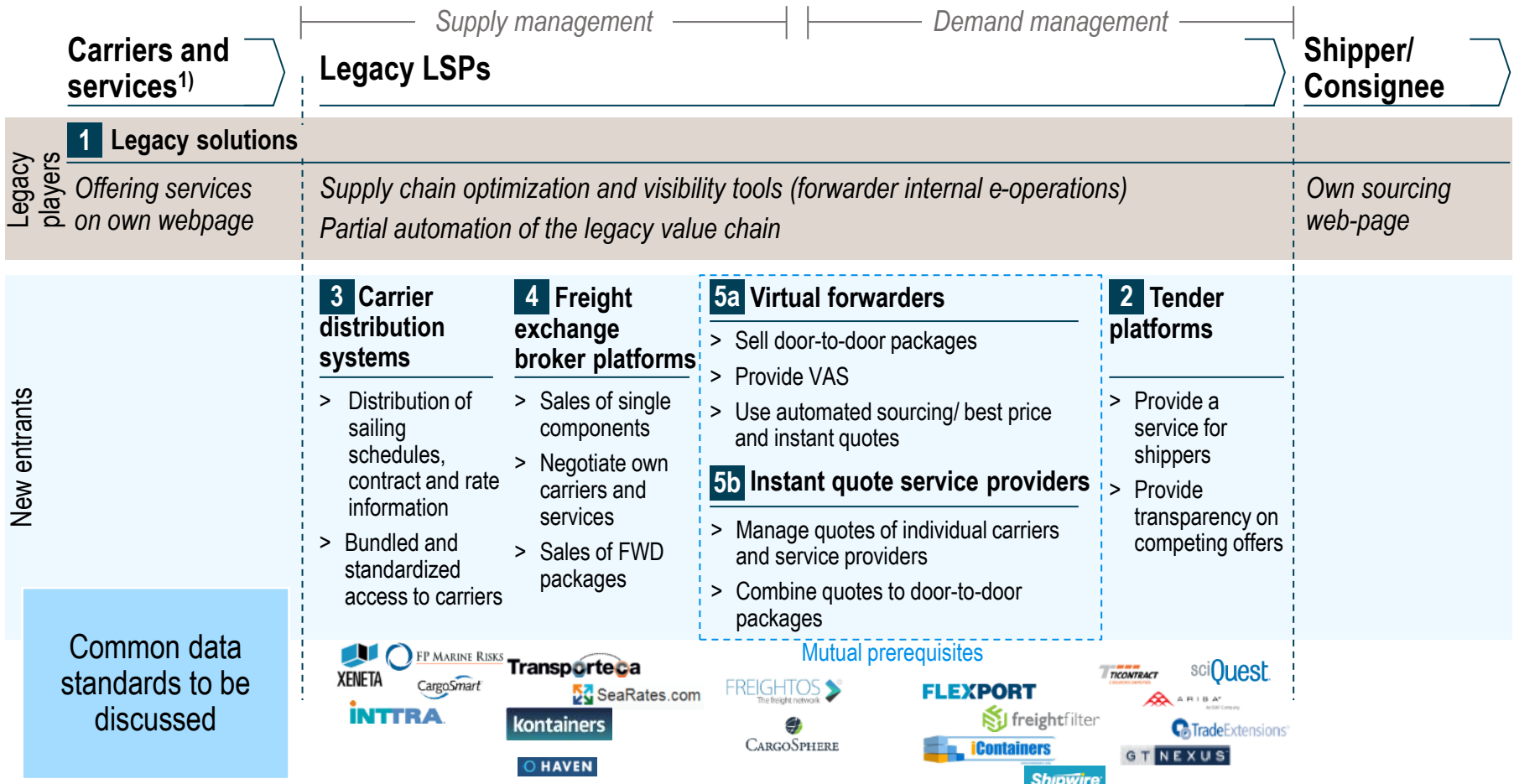
Success factors of the innovative logistics platforms

- **In-depth understanding** of the market/industry specific value chain, e.g. client buying practices, roles of the players, supply/demand balance per market segment, competition of legacy and innovative players and limitations
- **Clear vision of the business model** and **and risks of the new business**, to which company will be exposed, e.g. technical support provision, financial guarantees provision, service level guarantee, counter measures of the large players
- Understanding of the **turnaround options both**, on the business model and prototype level, to be able to react quickly on the market feedback
- Efficient development and launch model – capabilities to launch a prototype whtin **100 days**
- **Property of the firm on the technology**
- **Network effect strategy**

Источник: Roland Berger Strategy Consultants

Business models of new entrants into the freight forwarding business clustered in 5 groups – Each with different value proposition

Overview of business models



Source: company websites, Roland Berger

1) Including warehousing, customs clearance, trucking etc.

3 areas to explore : advanced pooling, automation and data

ADVANCED POOLING

Companies are still looking for logistics scale effects :

Deliberately:

> **internally** through the merger of distinct sales channels logistics into one consolidated **"omni-channel"**
> **externally** through a logistics **pooling** managed by a LSP for multiple vendors

Constrained:

> **on a local scale** through unique **urban logistics operators** selected by cities
> **on a global scale** by e-commerce leaders repositioning themselves as **LSP for third parties**

AUTOMATION

Automation's relevance is growing stronger due to the fragmentation of orders, multiplication of SKU and reduction of investments required for warehouse automation **– but its cost remains prohibitive for now.**

The solution may lie in robotization – a "flexible" alternative to large automated infrastructures

DATA

The right product at the right time at the right place – **for now, logistics has mainly been used to overcome the lack of reliable forecasts.**

"BIG DATA" holds unprecedented perspectives for LSP through the leveraging of both internal AND external data to optimize the supply chain

LSP Logistics Services Providers

Source: Roland Berger analysis

The Big 3 facts

The mass arrival of the robots in logistics is no longer a question. **The real question is how soon and how better to be prepared for it**

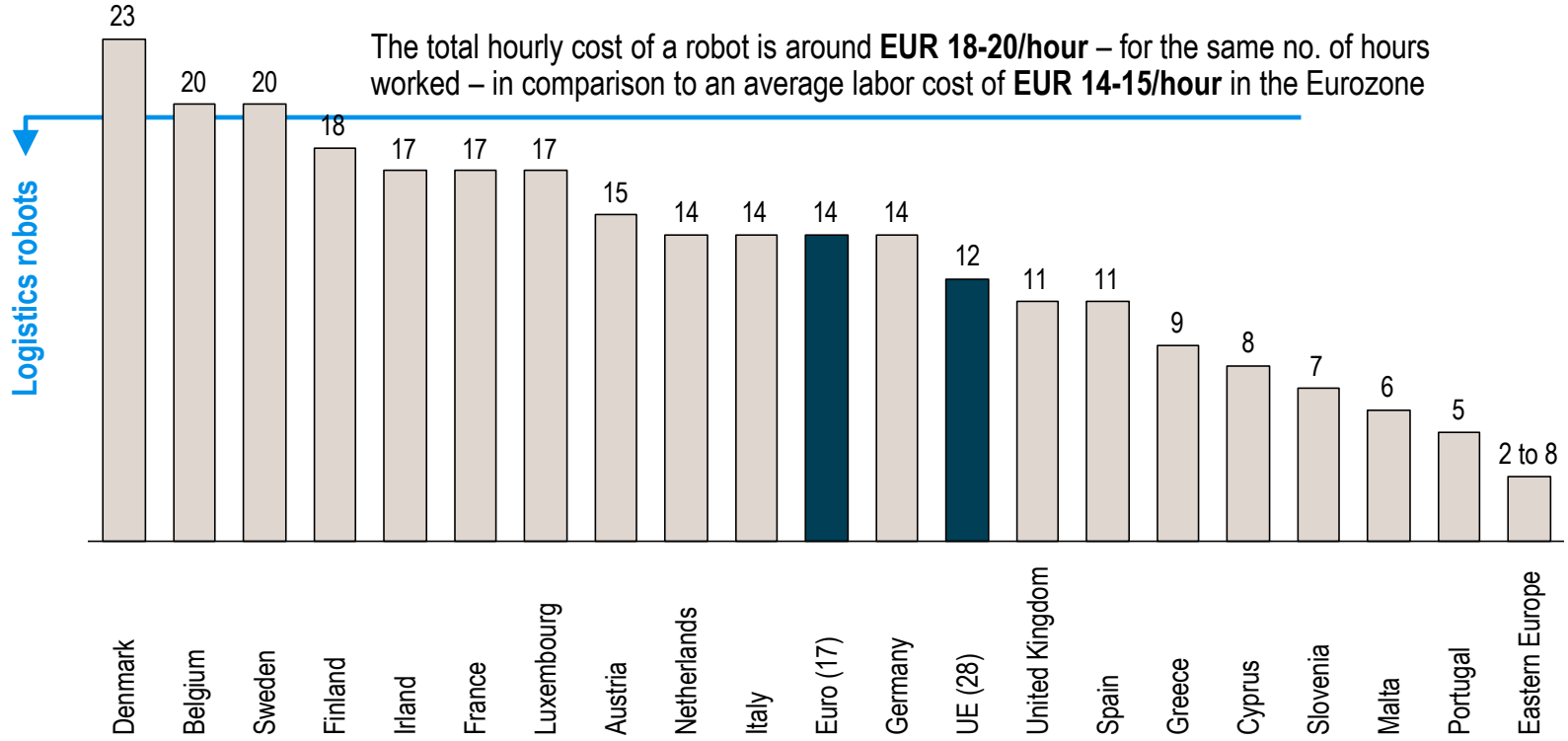
3.5 million jobs expected to be replaced by robots within the next ten years in the EU-15 zone

EUR 100,000 will be the full cost of a logistics robot in less than two years

20-40% cost reduction in handling thanks to expected robotic solutions

A comparison between the hourly cost of robotic and manual solutions highlights the relevance of robotization in the logistics industry

Estimate of average hourly cost in elementary occupations [EUR/hour, 2014]

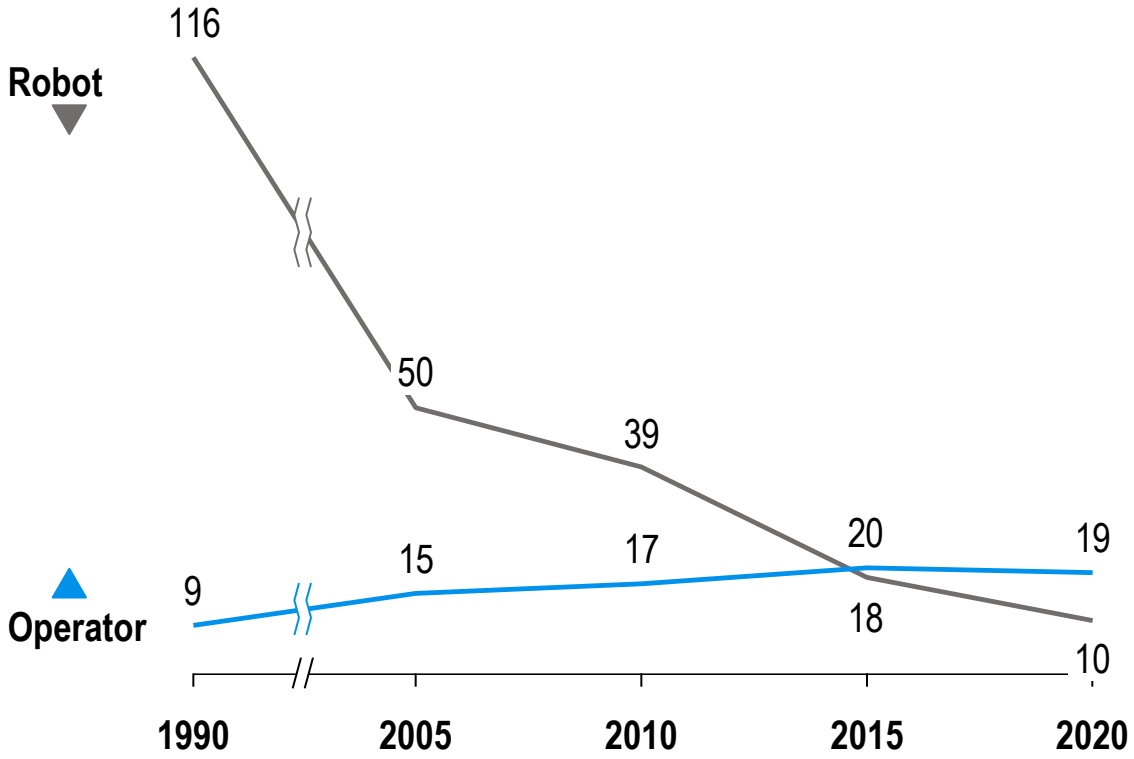


CAGR 2008/2014	2%	3%	3%	3%	1%	2%	3%	2%	2%	2%	**2%**	2%	2%	1%	2%	n/a	-1%	2%	2%	1%

Source: Eurostat, Roland Berger

Over time, increased productivity, the lengthening in the lifespan of solutions and the drop in equipment prices all favor the move towards robotization, while labor costs continue to rise

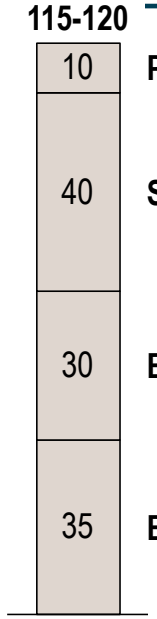
The hourly cost of robots v human operators [EUR/hour, France]



1) Retroactive comparison of the cost of a robot without taking technical capability into consideration, based on the evolution of the cost of industrial robots
2) Illustration of the elementary labor cost, based on the evolution of the hourly minimum wage in France

Estimate of the full cost of a robotic logistics solution [EUR '000/unit, 2015]

The total cost of robotic solutions is falling due to the drop in equipment and integration costs



Price drop factors	
Project	Shortening of integration period – Less than three to six months for solutions
System	Transition from a programming logic to a machine learning logic
Environment	The increasing pace of recognition and environmental analysis technologies makes human/machine collaboration possible
Equipment	Drop in the price of equipment with the emergence of "low-cost" solutions developed by start-ups

Source: IFR, INSEE, Eurostat, Roland Berger study

Though solutions are not entirely comparable, their price evolution highlights the change in the scale of robotics solutions designed for order-preparation operations

Example of the price evolution of logistic robots

Willow Garage's
PR2

2010
USD 400,000

Unbounded Robotics
UBR-1

2012-2014
USD 35,000-50,000

Rethink Robotics
Baxter

2015
USD 22,000

A 20-40% saving in handling costs is a good potential to trigger industry players attention

Selected effects of the robotization

1. **Manufacturers and research teams are understandably devoting their attention to order preparation** – which alone represents 40-50% of storage/handling costs – a task involving a high running time with low added value (up to 70% of the task)

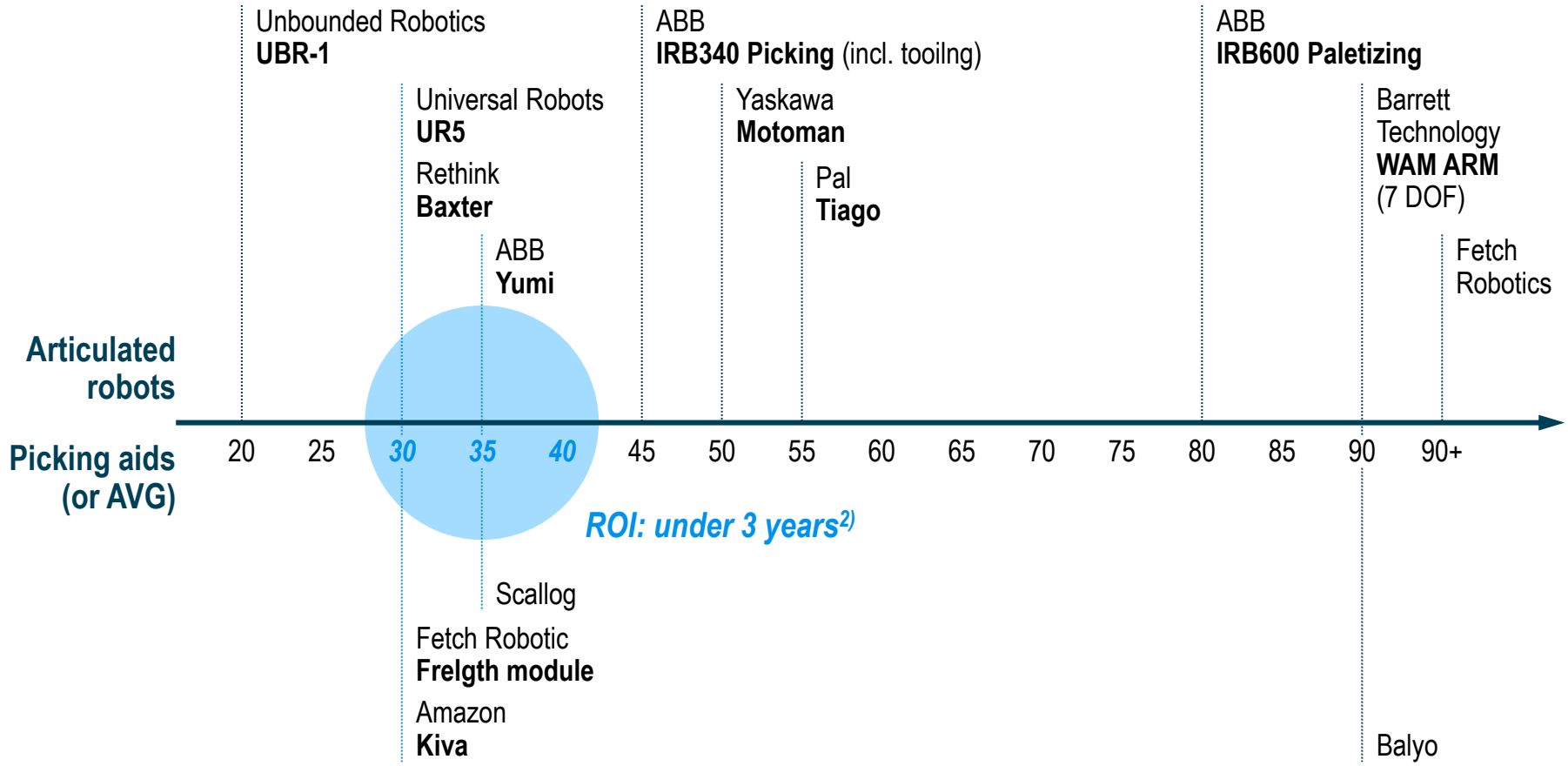
2. **Unsurprisingly, manufacturers promise significant picking productivity gains** since robots, assuming they are in continuous use, are four to six times more efficient than human operators (up to 800 items per hour). In practice, such productivity rates arc significant only if they speed up the sales cycle. Even the most advanced robotic solutions are rarely fully automated (80% at best), with human operators invariably managing complex formats or items with the lowest rotations

3. **Initial feedback, which is cautious, seems to indicate a drop in handling costs of 20-40%** with these configurations, a figure that varies depending on the complexity of order preparation operations, the order range, the warehouse layout, etc. In general terms, this level of productivity gain is enough to finance the investment

4. **Attention needs to be drawn, however, to a number of technical obstacles**. The formation of mixed pallets, the stability of upright stacking and unstacking operations and the picking of variable, flexible or oversized packaging arc just some of the operational realities on which trial projects continue to stumble. There is no doubt that these hurdles will be overcome in the near future

Some of the robots already have potential ROI of under 3 years

Examples of order-preparation robot prices[1] ['000 of EUR/unit]



1) EUR/USD exchange rate as of 09/15 – indicative prices – equipment only
2) Depending on use and productivity gains

Productivity gains can be significant for AGV

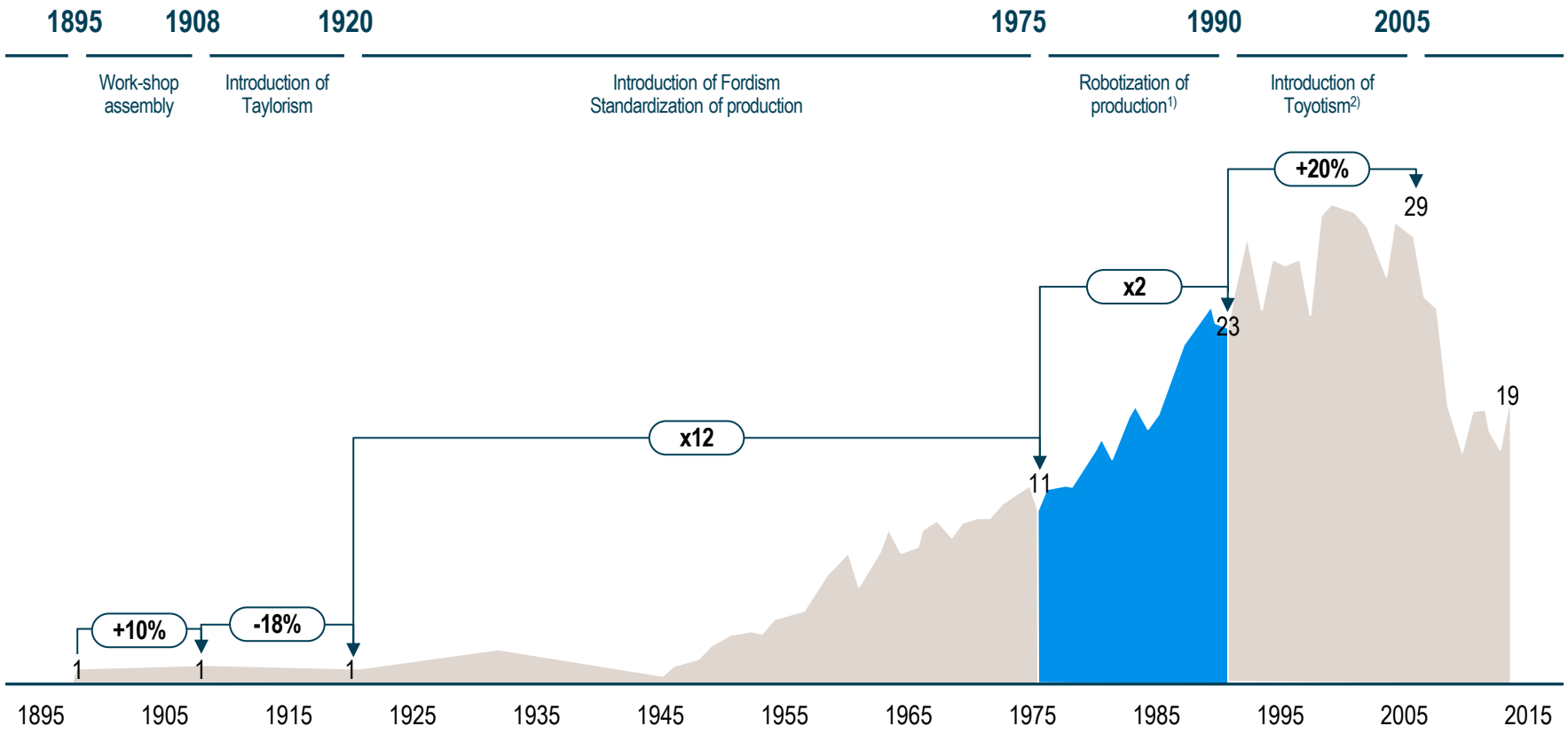
Examples of productivity gains from AGV (Automated Guided Vehicles)

Toyota – Pick&Go	Balyo	Kiva/Scallog
Standard pallet-truck adaptation for moving pallets and assisting the operator during order preparation	Automation kit for a standard GPS-guided fork-lift truck, capable of loading/unloading a pallet	Shelf-carrying system capable of moving around the warehouse and transporting products to the packer
Productivity: up 25% (industrial)/manufacturer 60 to 100% (depending on use)	**Productivity:** up 60-70%	**Productivity:** up 20-40%
Forecast ROI: less than 36 months	**Forecast ROI:** less than 18 months	**Forecast ROI:** 24-36 months
Energy saving: -7%	**Price:** EUR 90,000 (for one unit as a standalone)	**Storage saving:** up to 30%
Storage saving: 30-40%		**Price:** EUR 25,000-35,000 (estimated) (for 10 units)
Price: EUR 60,000-90,000		

Source: manufacturers, press

Study of the similar developments in automotive industry demonstrate a 100% growth of the productivity over ~15 years

Productivity of an automotive manufacturer [number of cars per year and per FTE]

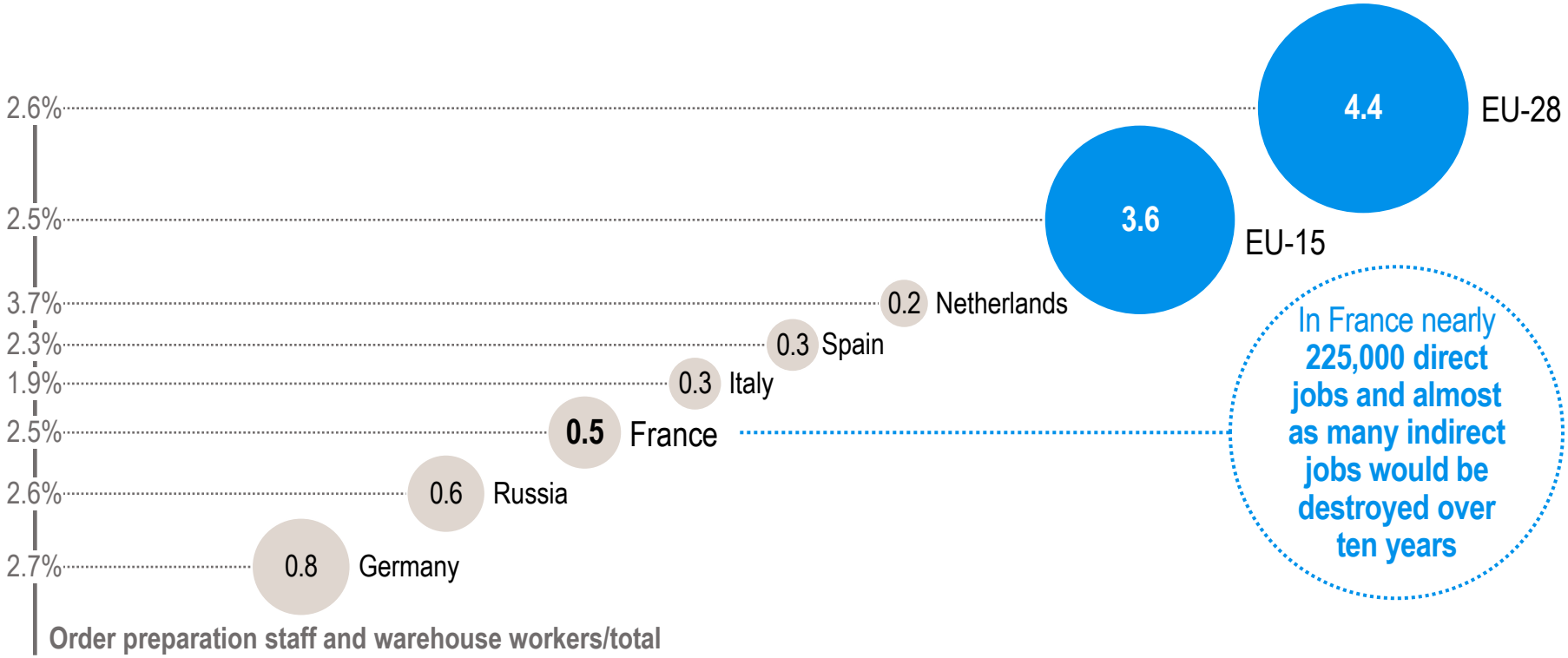


1) Including painting robots (1979), machining robots and assembly robots in particular
2) Zero default, zero delay, zero stock

Source: constructors' data, press research, Roland Berger study

The comparison between logistic and automotive robotics reveals that around 3,6 m jobs would be destroyed in EU-15

Proportion of order preparation staff and warehouse workers/total jobs, 2013 [m]



Industry players, including LSPs, clients and systems suppliers should consider having own strategy in robotization domain

WHAT ARE THE STAKES FOR LOGISTICIANS?

Defining a new business model. Robotization-related gains will be significant enough to impact on the business model and the logistics value chain. Awareness of this is still limited, however, even though a certain number of players are launching trial projects with high level of secrecy

Supporting and financing research and training into these new robotics professions is essential and should be accelerated now. Otherwise, the robots will be Japanese, Korean or Chinese, they will operate all across Europe and lost jobs will be offset elsewhere.

We would be glad to answer your questions and share our knowledge in "Logistics 4.0" domain

Contact information of the speaker

Artem **Zakomirnyi**

Principal
Competence Centers
"Transportation" and "Consumer good and Retail"

+7 962 360 06 02

Artem.Zakomirnyi@rolandberger.com

Артем **Закомирный**

Принципал

Центры Компетенций "Транспорт" и "ТНП и розница"

+7 962 360 06 02

Artem.Zakomirnyi@rolandberger.com

Источник: Roland Berger


Roland
Berger