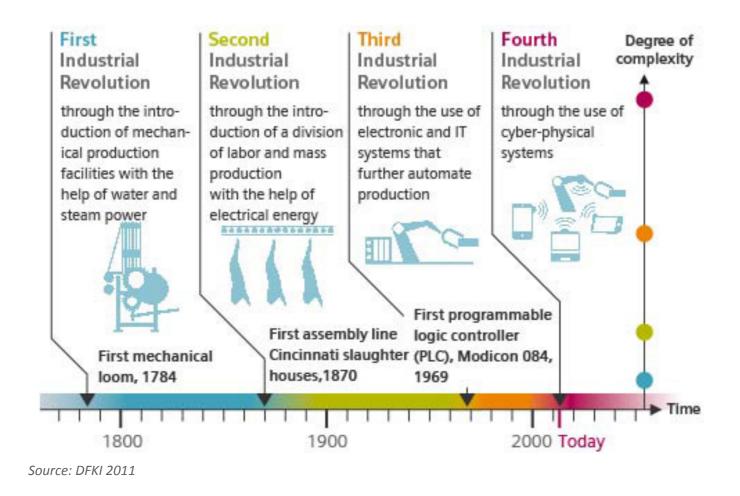
## Industry 4.0 – il Framework

Gian Paolo Balboni Digital Transformation Evangelist

## Industry 4.0 – La nuova rivoluzione industriale

Il termine Industry 4.0 è stato coniato in Germania nel 2011 per indicare il nuovo percorso di automatizzazione spinta che quel paese stava lanciando per restare alla guida della produzione industriale Europea.

La prima volta che è stato usato in pubblico risale all'Hannover Fair del 2011



### Industry 4.0 come iniziativa del governo tedesco

#### Chair Ministers Gabriel, Wanka

Representatives of commerce, trade unions, science

Technical/practical expertise decision-making

#### Steering body (companies)

- Chaired by business representatives, participation of Economic Affairs and Research Ministries
- Chairs of working groups, other guests/ promoters

Industrial strategy development, technical coordination, decision-making and implementation

#### Working groups

- Reference architecture, standardisation
- Research and innovation
- · Security of networked systems
- Legal framework
- Labour, training
- Others as required

Working units with technical/practical expertise; participating ministries: Economic Affairs, Research, Interior, Labour Policy guidance, society, multipliers

#### Strategy group (Government, business, unions, science)

- Chaired by StS Machnig, StS Schütte
- Representatives of steering body
- Representatives of Federal Chancellery, Interior Ministry
- Representatives of the Länder
- Representatives of associations (BDEW, BDI, BITKOM, DIHK, VDA, VDMA, ZVEI)
- Representatives of trade union (IG Metall)
- Representatives of science (Fraunhofer)

Agenda setting, political steering, multipliers

Activities on the market

#### Industrial consortia and initiatives

Implementation on the market: test beds, examples of applications

#### International standardisation

Consortia, standardisation bodies, DKE and others

Scientific Advisory Committee

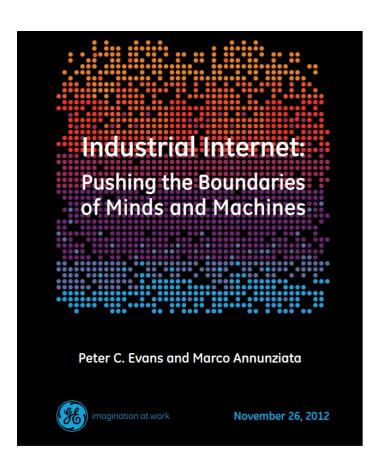
#### Secretariat as service provider

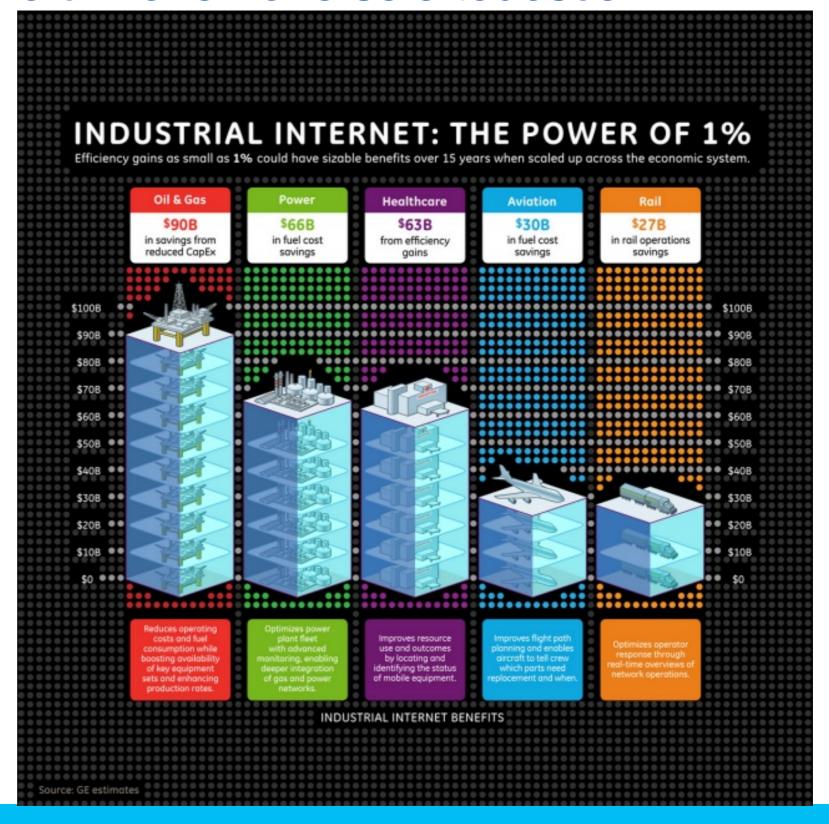
Network coordination, organisation, project management, internal and external communication

In October 2012 the Working Group on Industry 4.0 chaired by Siegfried Dais (Robert Bosch GmbH) and Kagermann (Acatech) presented a set of Industry 4.0 implementation recommendations to the German federal government.

On 8 April 2013 at the Hanover Fair the final report of the Working Group Industry 4.0 was presented.

### Naturalmente non è un fenomeno solo tedesco





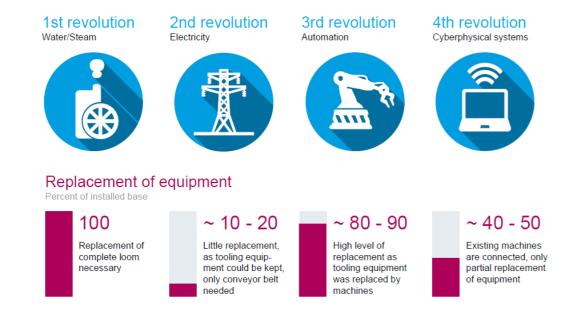
## McKinsey la focalizza nel manufacturing

McKinsey defines "Industry 4.0" as <u>digitalisation of the manufacturing sector</u>, with embedded sensors in virtually all product components and manufacturing equipment, ubiquitous Cyber Physical Systems, and analysis of all relevant data.

McKinsey&Company

It is driven by four clusters of 4 disruptive technologies.

- 1. Data, computational power and connectivity (i.e. low-power, wide area networks)
- 2. Analytics and intelligence
- 3. Human-machine interaction comprising touch interfaces and augmented reality
- 4. Digital to physical conversion (i.e. advanced robotics and 3D printing)



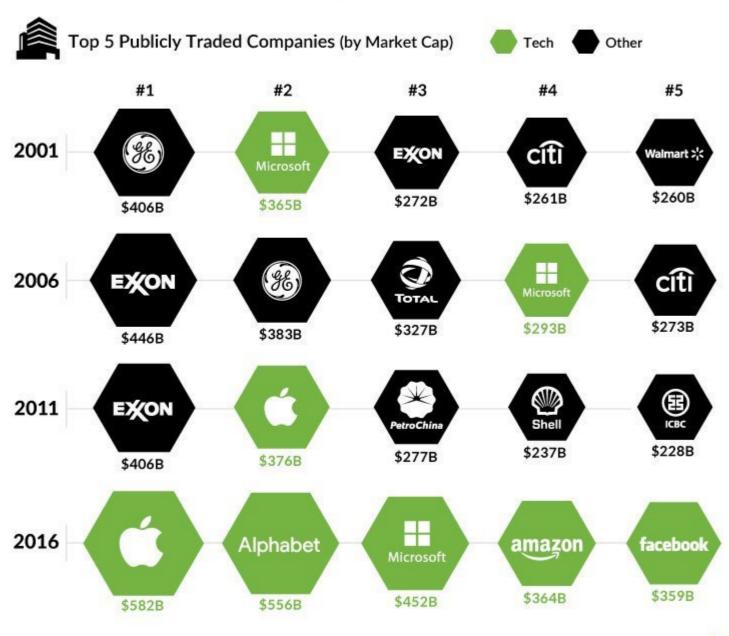
Compared to the 3rd industrial revolution, the 4th revolution will have relatively high impact at comparatively little replacement of equipment

(Source McKinsey&Company «Industry 4.0: How to navigate digitalisation on the manufacturing sector » 2015)

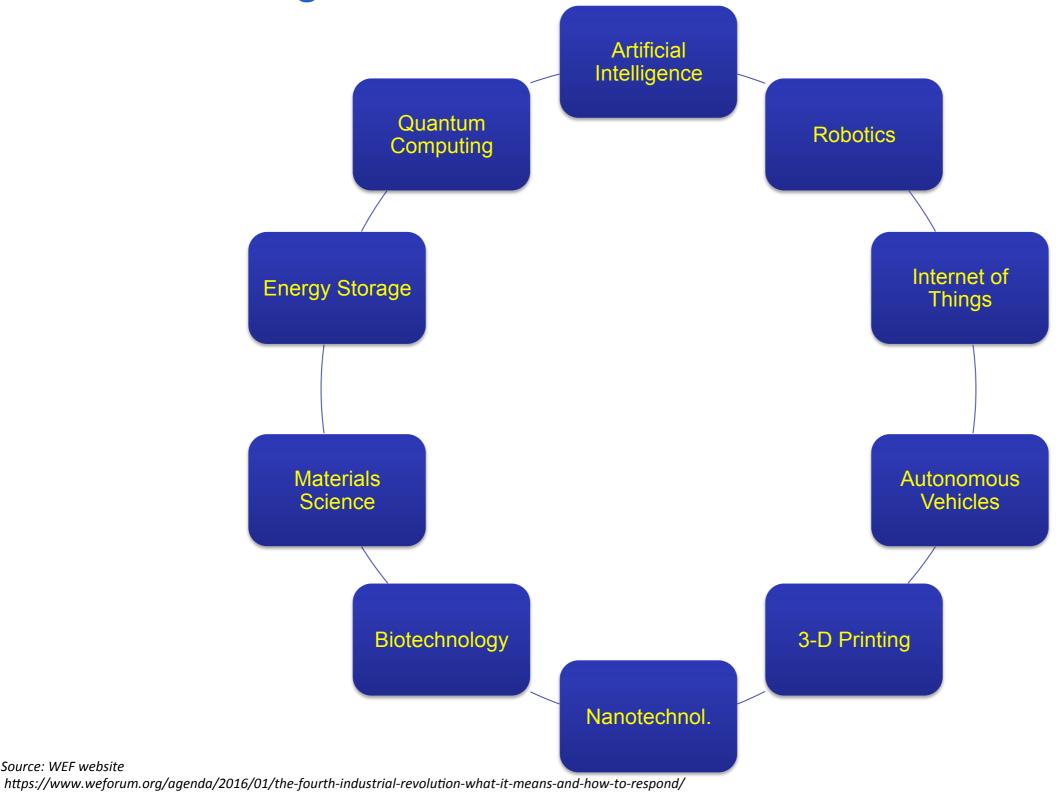
#### Ma il mercato esalta la centralità dell'IT

#### THE LARGEST COMPANIES BY MARKET CAP

The oil barons have been replaced by the whiz kids of Silicon Valley



## Le tecnologie della trasformazione



Industry 4.0 overview - Gian Paolo Balboni

Source: WEF website

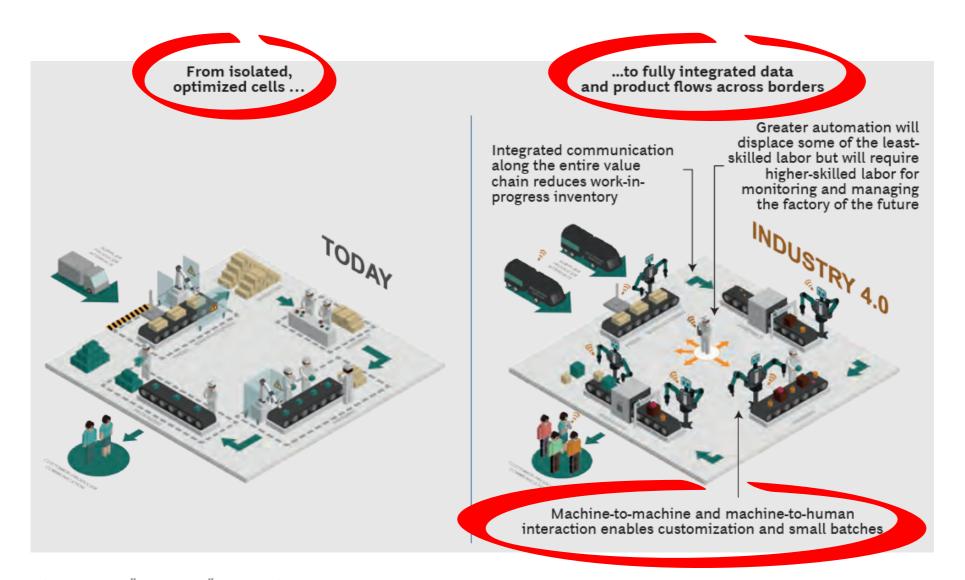
### Le fasi in cui porta cambiamento

Da prodotto a servizio
Capex vs Opex Gestione real time processi
Gestione fornitori
Lean cycle
Produzione
distribuita e 3D O Dati real time sull'uso

Metriche per manutenzione O Integrazione di sensori (prodotto e linee produttive) Reti iper-local API per terze parti
Pay-as-you-go
Marketplace Modelling e Conoscenza simulazione cliente distribuita e 3D Training anticipato **Printing** Feedback social Service Level Ciclo di vita e Total Agreement Quality Process Reingeneering **Produzione Business** Progetto Informazioni Model

Utilizzo

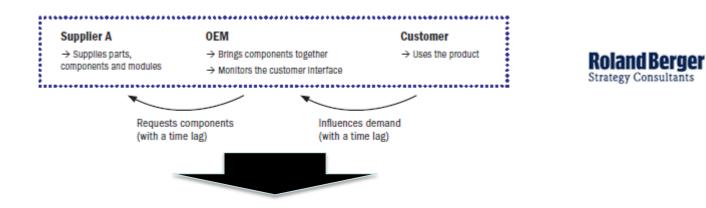
## Un sistema permeabile grazie al «data sharing»



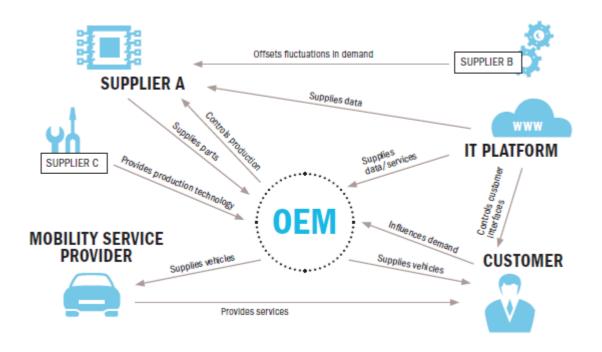
(Source BCG – "Industry 4.0" April 2015)

## Si modificano i rapporti cliente-fornitore

Da una catena del valore rigida...



...a una rete dinamica di produttori di valore aggiunto



(Source Roland Berger «The Digital Transformation of Industry»)

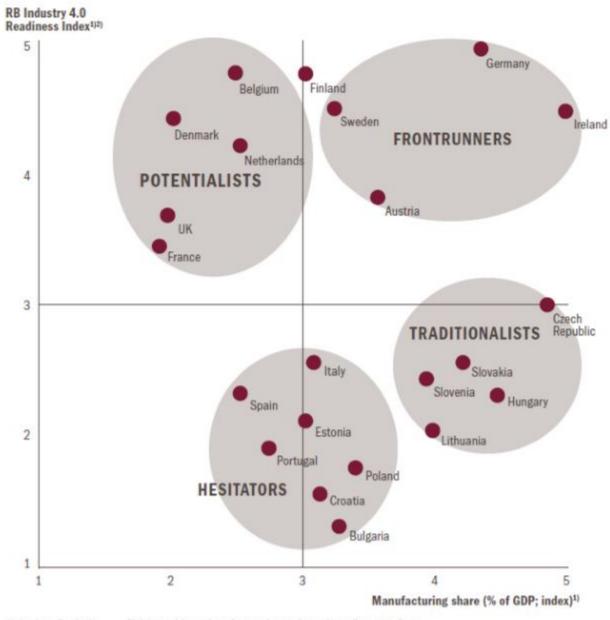
### Il cuore della transizione è nella manifattura

Characteristics of new Industr	e 4.0
1 FROM MASS PRODUCTION TO MASS CUSTOMIZATION	Flexible production, short production lead time enabling new business models emergence and affordable customization
2 FROM VOLUME SCALE EFFECT LOCALIZED & FLEXIBLE UNITS	TO 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 STO DYNAMIC MAKE TO ORDER	CK TO 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 USAGE	Integrated conception, services being a key element of the business model/ decision factor
5 FROM COST DRIVEN TO ROCE DRIVEN	Higher ROCE for lower Capital employed as complexity is transferred on numeric
6 FROM TAYLORISM TO FLEXIBLE WORK ORGANIZA	Remote work (augmented reality, permanent connectivity), Tasks parallelism, flexible organization and management
7 FROM HARD WORKING CONDIT TO ATTRACTIVE WORK SPACE	Development of complex artisanal production, with clean/ highly connected work space, white collars intensive  The Industrie 4.0 transition  How it restruction the economic, social and industrial model
2016	World Manufacturing Forum

Max Blanchet

## Stato dell'arte nei paesi EU





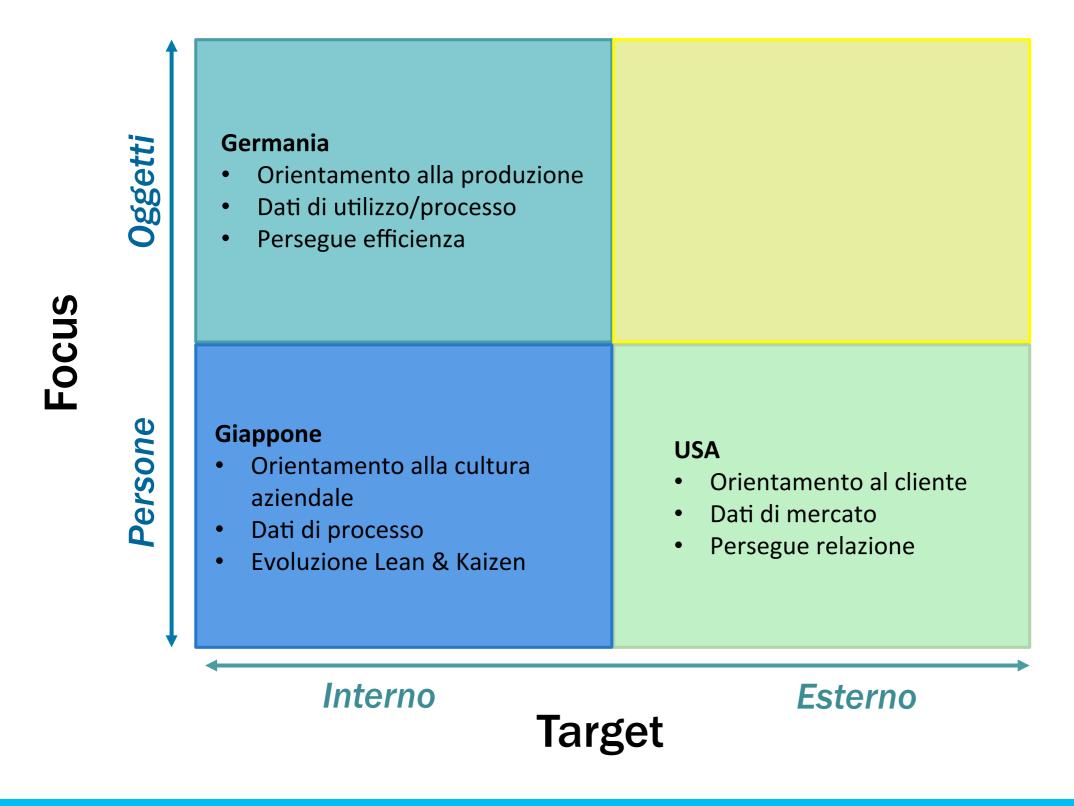
1) 1 - low, 5 - high

2) Adjusted for outliers Cyprus, Latvia, Luxemburg, Romania, Greece

# Le principali iniziative nel mondo



### Si vedono almeno tre diverse declinazioni nel mondo



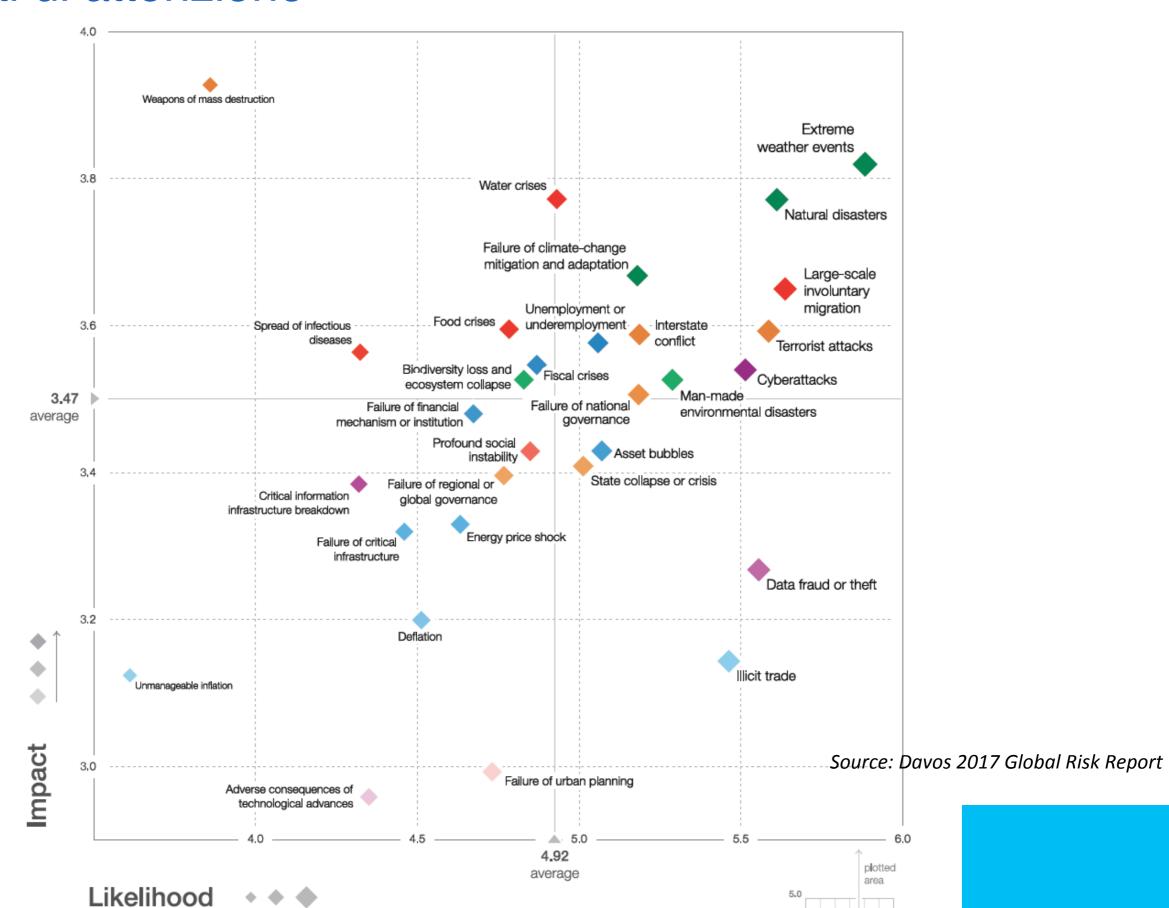
#### Punti di attenzione

"We live in disruptive times where technological progress also creates challenges. Without proper governance and re-skilling of workers, technology will eliminate jobs faster than it creates them. Governments can no longer provide historical levels of social protection and an anti-establishment narrative has gained traction, with new political leaders blaming globalisation for society's challenges, creating a vicious cycle in which lower economic growth will only amplify inequality. Cooperation is essential to avoid the further deterioration of government finances and the exacerbation of social unrest"

- Cecilia Reyes, Chief Risk Officer of Zurich Insurance Group.

Source: Davos 2017 Global Risk Report

#### Punti di attenzione

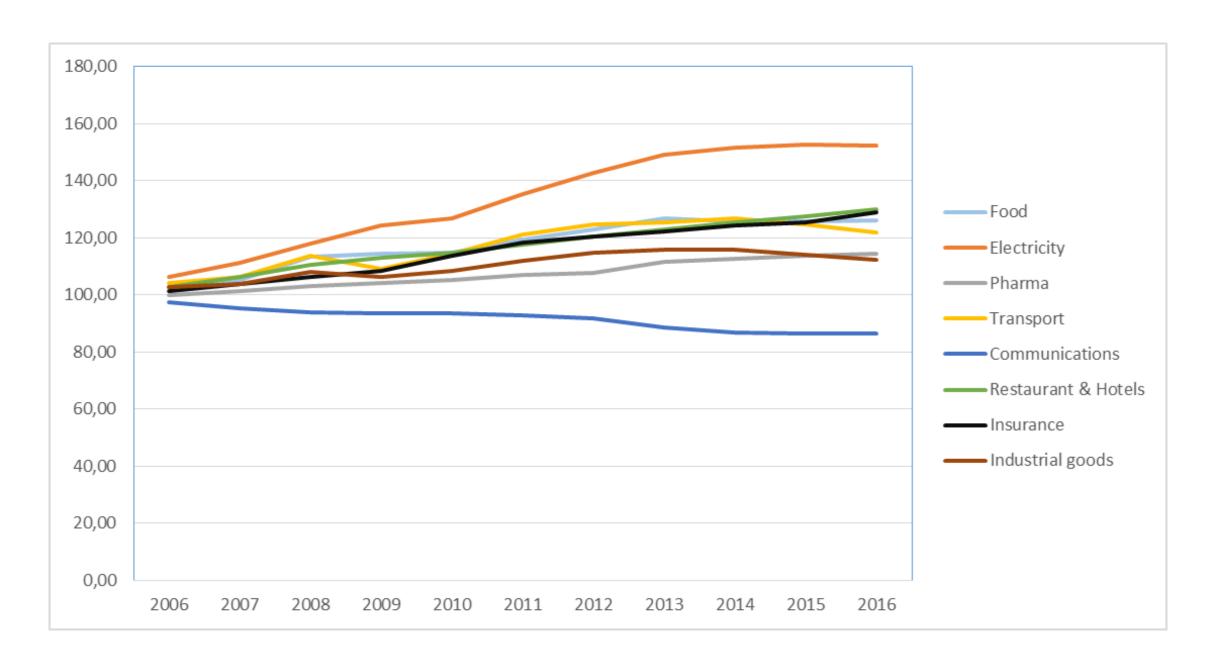


#### Punti di attenzione

Top 10 risks in terms of Top 10 risks in terms of Likelihood **Impact** Extreme weather events Weapons of mass destruction Large-scale involuntary migration Extreme weather events Natural disasters Water crises Terrorist attacks Natural disasters Failure of climate-change mitigation and adaptation Data fraud or theft Large-scale involuntary migration Cyberattacks Illicit trade Food crises Man-made environmental disasters Terrorist attacks Interstate conflict Interstate conflict Unemployment or underemployment Failure of national governance

Source: Davos 2017 Global Risk Report

### Le avvisaglie di un cambiamento disruptive Andamento dei prezzi al consumo per diverse industry in EU 28



Source: elaborazione GPB su dati Eurostat 2016

### Parliamone



mail to: gianpaolo\_balboni@outlook.it