

Patrizio Bianchi

4.0 **La nuova rivoluzione industriale**



Patrizio Bianchi

4.0

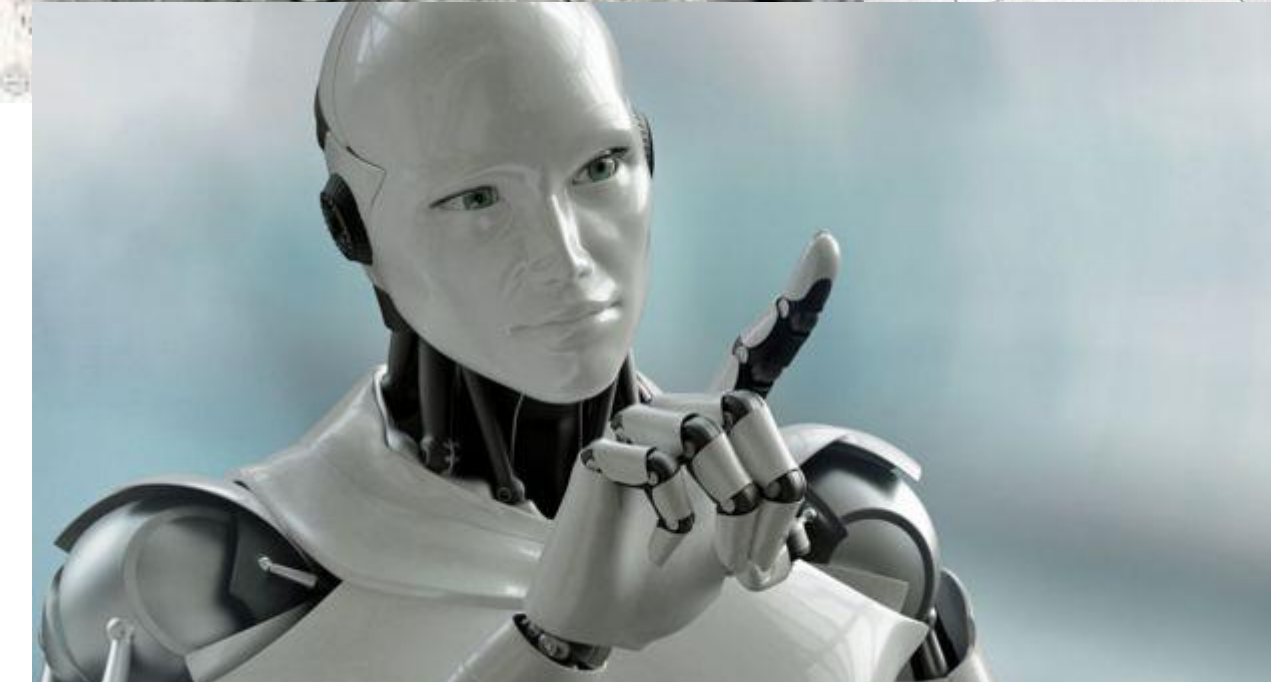
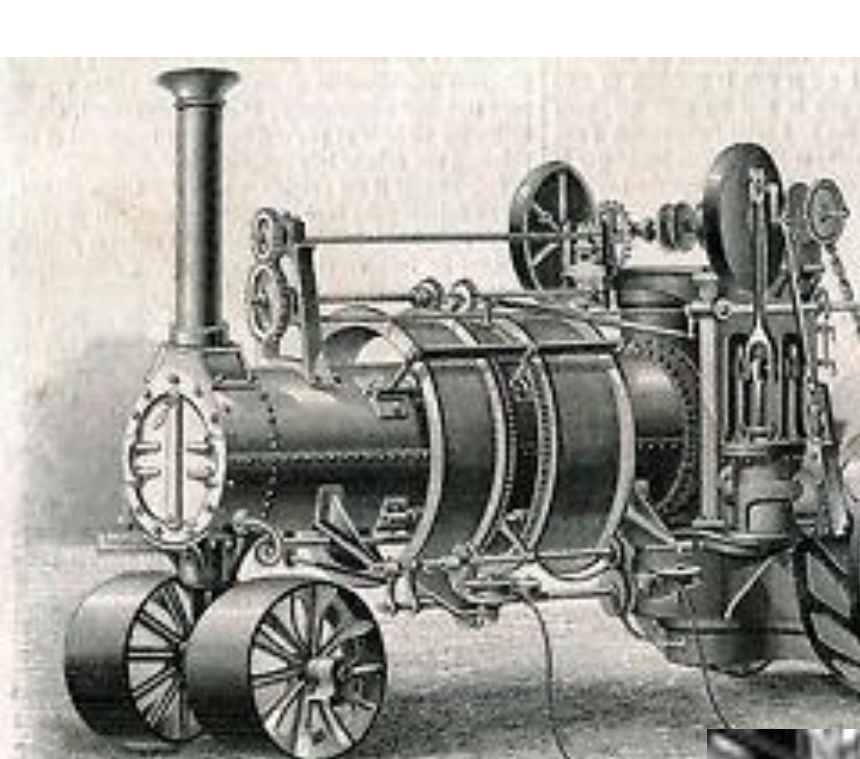
**La nuova rivoluzione
industriale**

Il Mulino, 2018

ISTAO

Ancona

5 novembre 2018



Scientifica

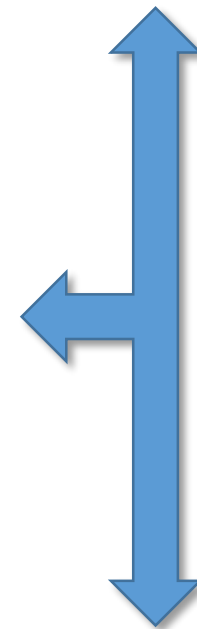
Politica

culturale

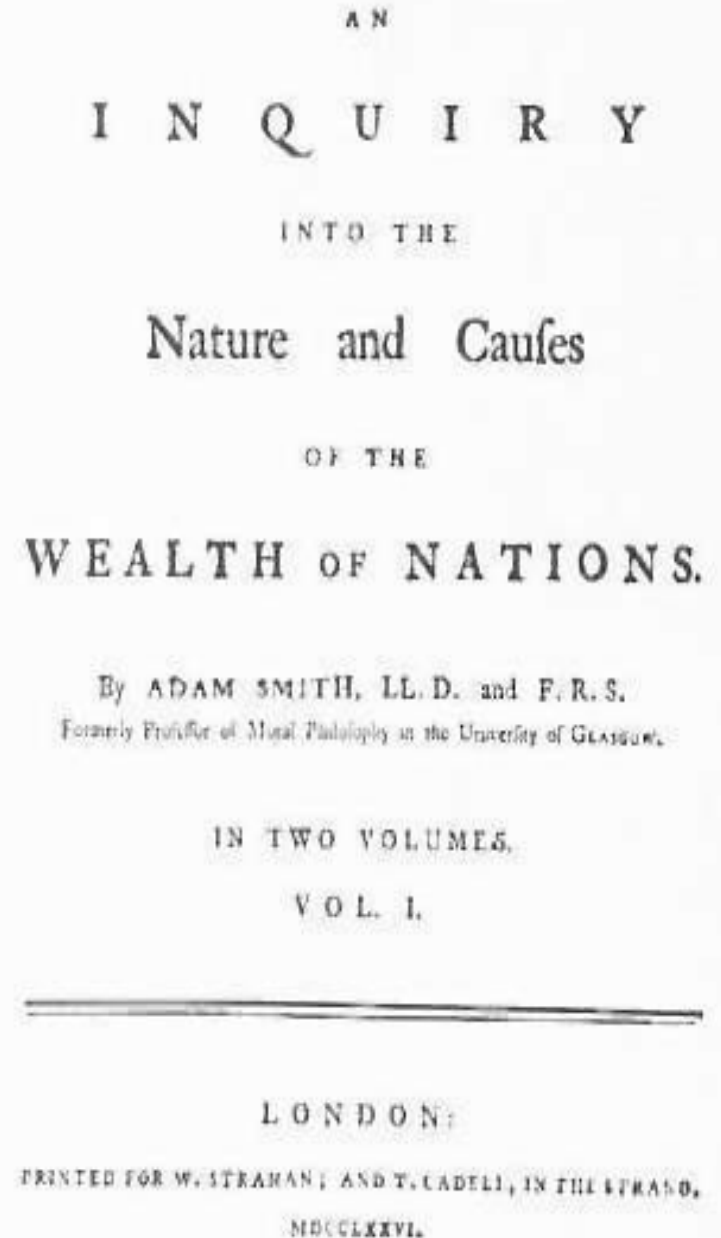
Rivoluzione
industriale

Cambiamento
tecnologico

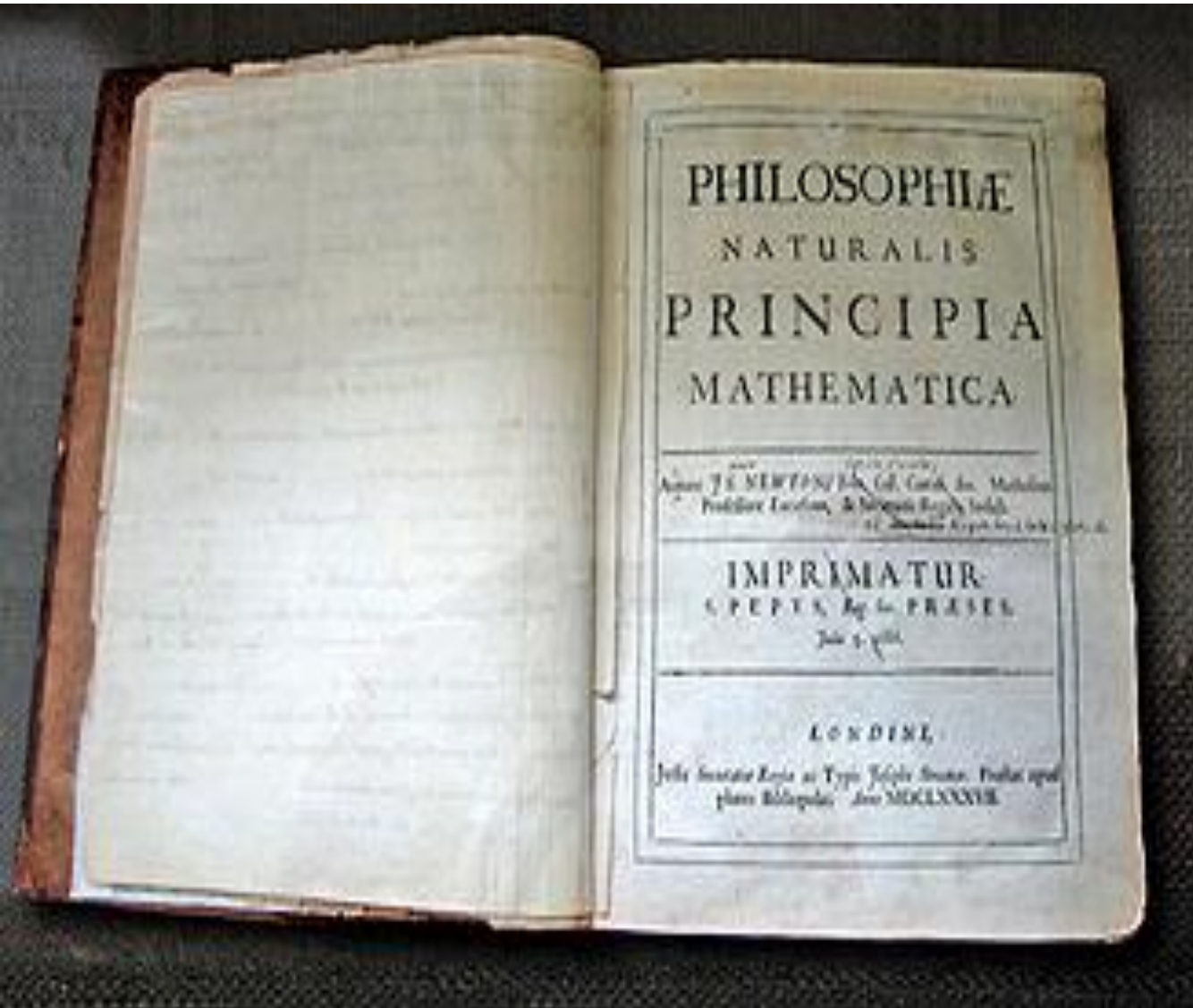
Trasformazione
sociale



- “The greatest improvement in the **productive powers of labour**, and the greater part of the **skill, dexterity, and judgement**, ...seem to have been the effects of the **division of labour**” (WN, I, I, p.13)



1687 La rivoluzione scientifica NEWTON



Gli astri si muovono senza bisogno di un centro

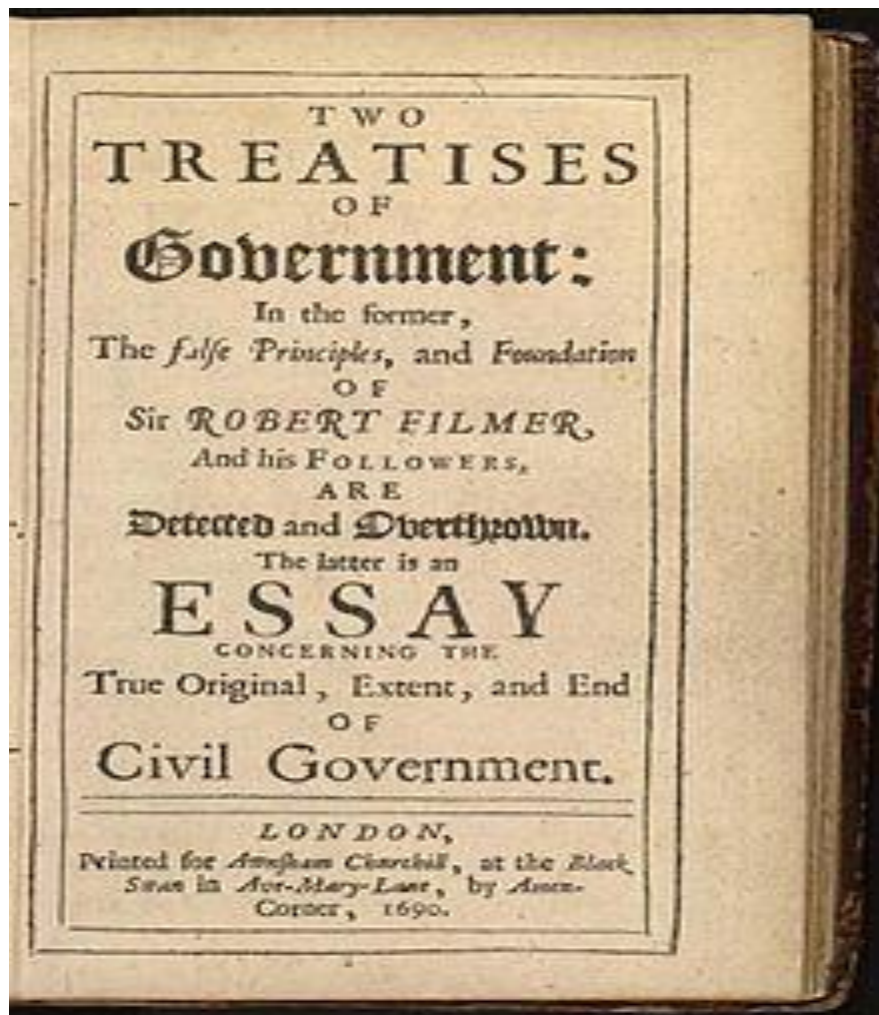
Il movimento delle stelle dipende dalla stessa interdipendenza fra corpi aventi diverso peso e diversa consistenza

La rivoluzione politica

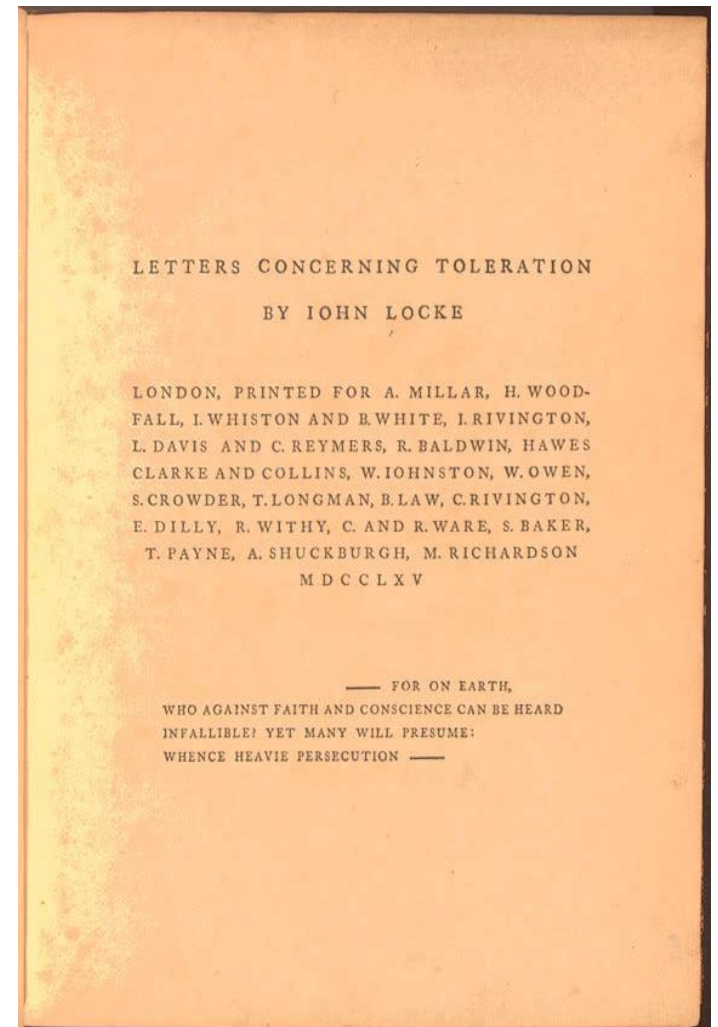
LA GLORIOSA
RIVOLUZIONE
FA EMERGERE
GLI UOMINI
NUOVI, CHE
VOGLIONO
AFFERMARE
SE STESSI CON
LE PROPRIE
CAPACITA'

1688-
1689





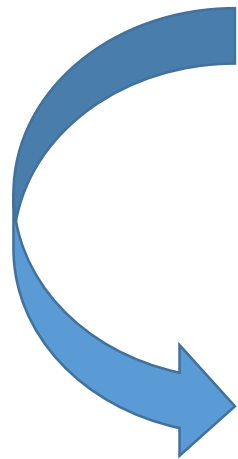
La rivoluzione culturale 1690



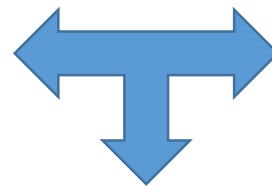
IL GOVERNO DI UN PAESE SI BASA
SULLA INTERAZIONE DI TUTTI GLI
ATTORI SOCIALI, FAVORENDONE LA
CRESCITA COLLETTIVA

«As it is the power of exchanging that gives occasion to the division of labour, so the extent of this division must always be limited by the extent of the power, or, in other words, by the extent of the market»

A.Smith, The Wealth of Nations, I, 3, 1776



production



market

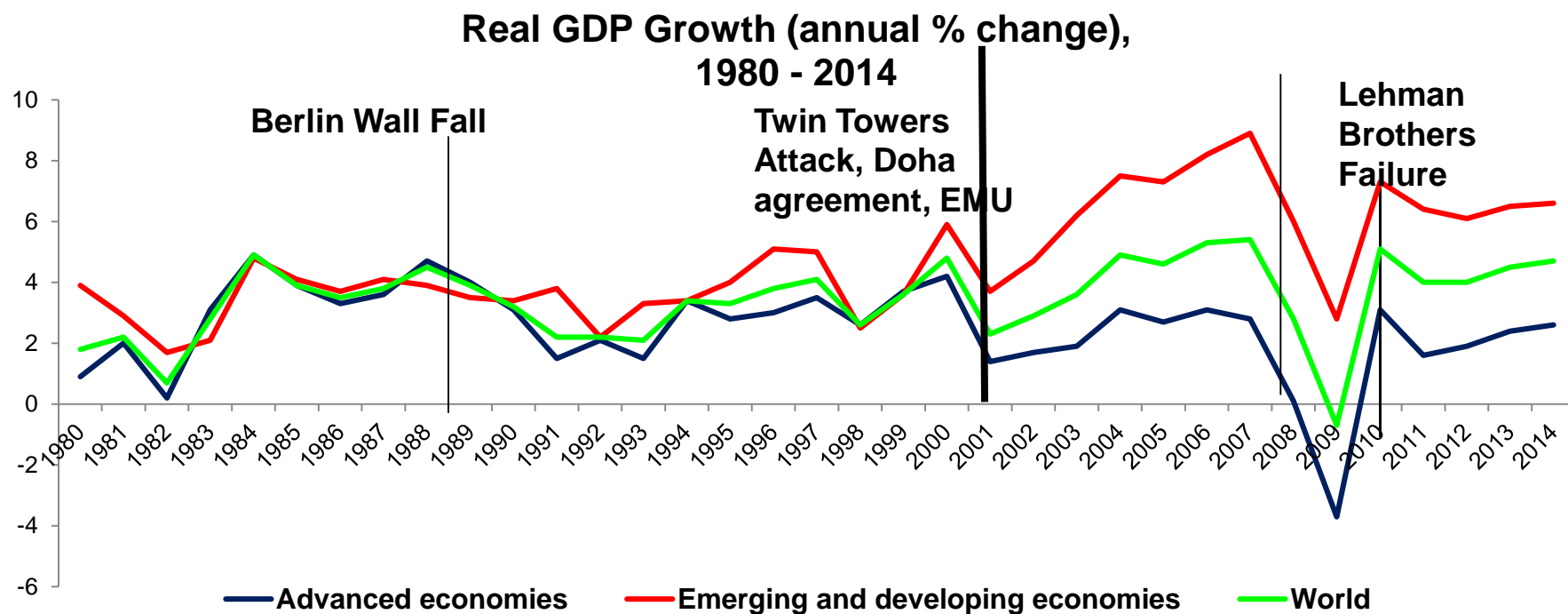


power

Industrial revolution	periods	Political identity	Reference technology/ SCIENCE
1 industr.rev.	1730 - 1880	Nation states	Steam power GRAVITY
2 industr. Rev.	1880 - 1950	Nationalism and imperialism	Electricity and automotive RELATIVITY
3 industr. Rev.	1950 - 2000	Bipolar world	Electronics and informatics QUANTISTIC
4. industr. Rev.	2000 →	globalization	Hyperconnection

Le rivoluzioni politiche, scientifiche , culturali che preparano la 4° rivoluzione industriale

È finito il '900



Nuovi attori nel mercato globale

Facebook 2004

Youtube 2005

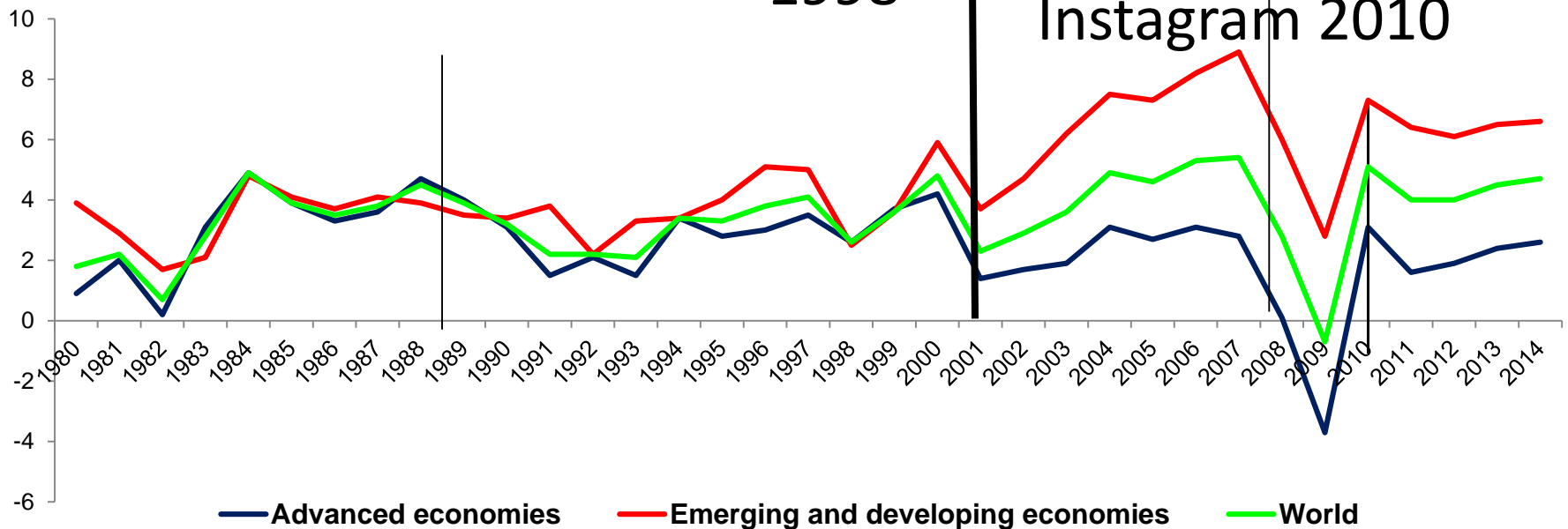
Bitmoji 2008

Uber 2009

Whatapp 2009

Instagram 2010

Google
1998



All'aumento della estensione del mercato,
il mercato si segmenta

Upgrading the segmentation scale,
il prodotto aumenta
I suoi caratteri identitari



il caso Berluti

Il caso Lamborghini



Product definition

Volumes of
production

high	Fordist production		Industry 4.0
medium		Flexible production	
low			craft production

low

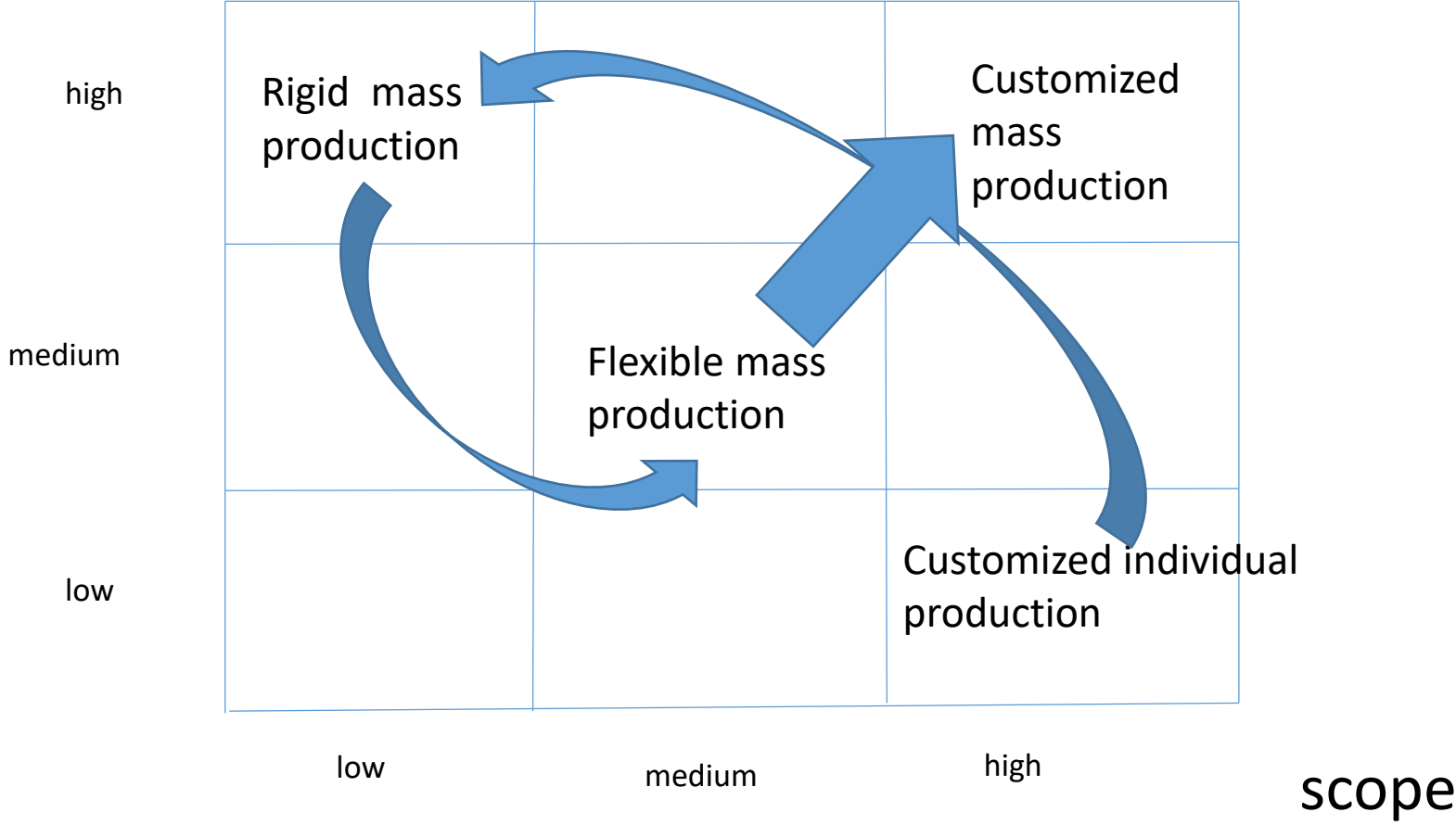
medium

high

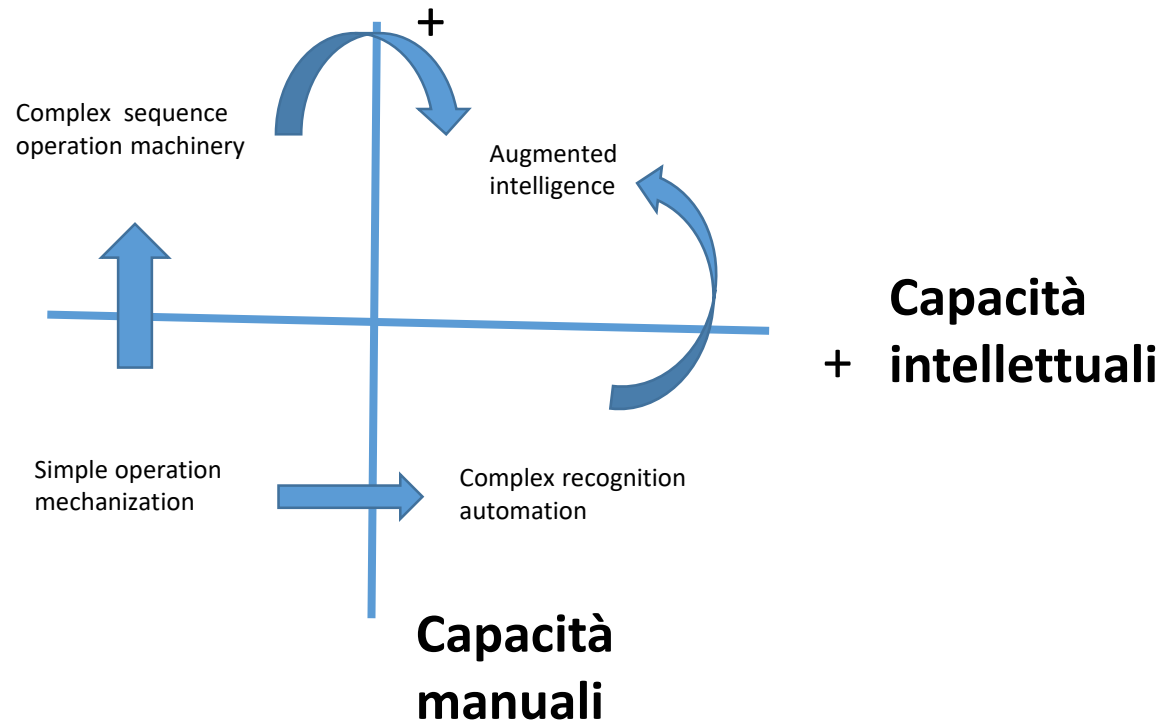
Product
Differentiation

Process organization

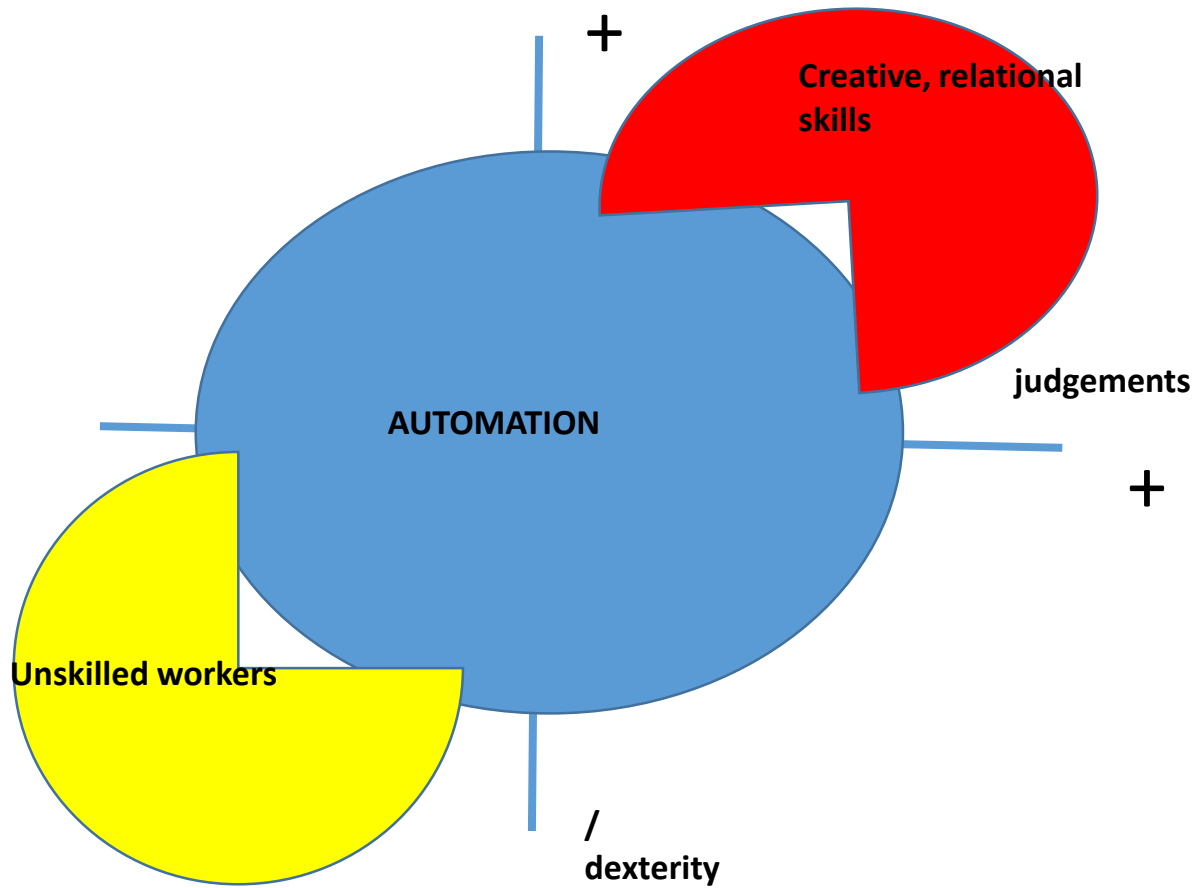
scale



L'impatto dell' Automazione sulla Produzione

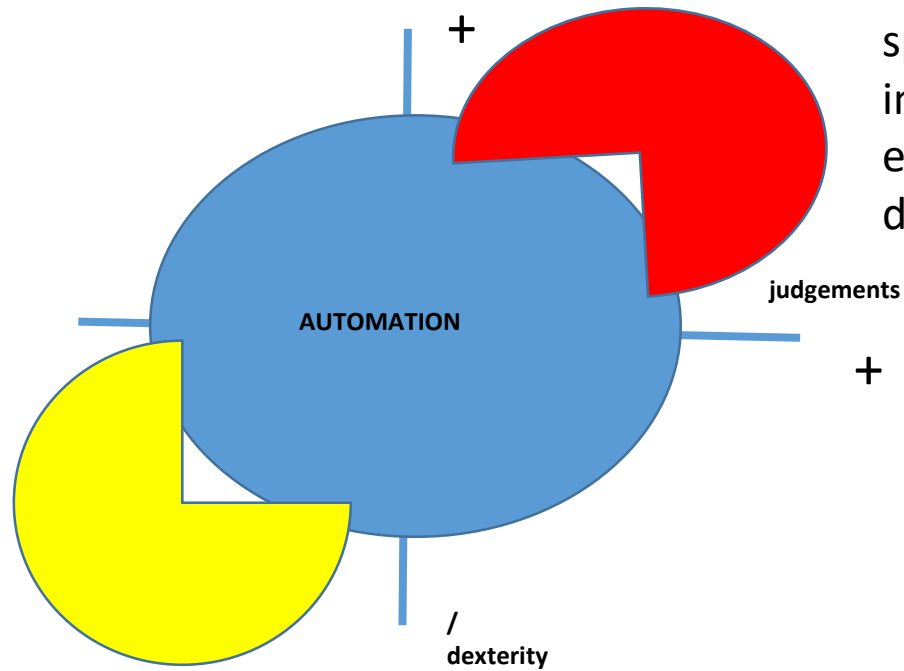


L'



Impatto della automazione sui sistemi produttivi

Piccole imprese a bassa specializzazione isolate



Imprese piccole ad alta specializzazione integrate in ecosystem dinamici

specializzazione

alta

Piccole imprese isolate ma ad alta specializzazione

Imprese ad alta specializzazione riunite in sistemi territoriali avanzati

bassa

Piccole imprese a bassa specializzazione e isolate

Piccole imprese a bassa specializzazione in distretti tradizionali

Sistemi territoriali di impresa

bassa

alta

complementarità

specializzazione

alta

Piccole imprese isolate ma ad alta specializzazione

Imprese ad alta specializzazione riunite in sistemi territoriali avanzati

bassa

Piccole imprese a bassa specializzazione e isolate

Piccole imprese a bassa specializzazione in distretti tradizionali

bassa

alta

complementarità

Politiche di
riposizionamento



Politiche di inserimento di un territorio nelle Global Value Chain

Il caso della
industria elettronica
in Guang Dong e in
Malaysia

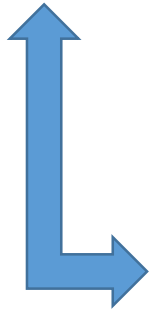


Upscaling the GVCs

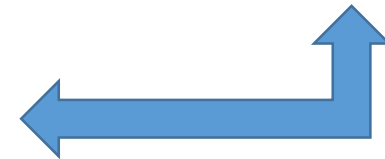
Strategia di
inserimento
in GVC

Attrazione e
radicamento attori
internazionali

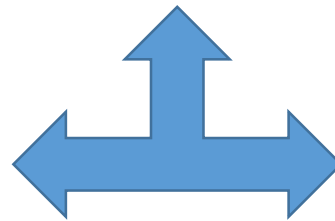
Sistema
produttivo
locale



Infrastrutture
educative e
scientifiche

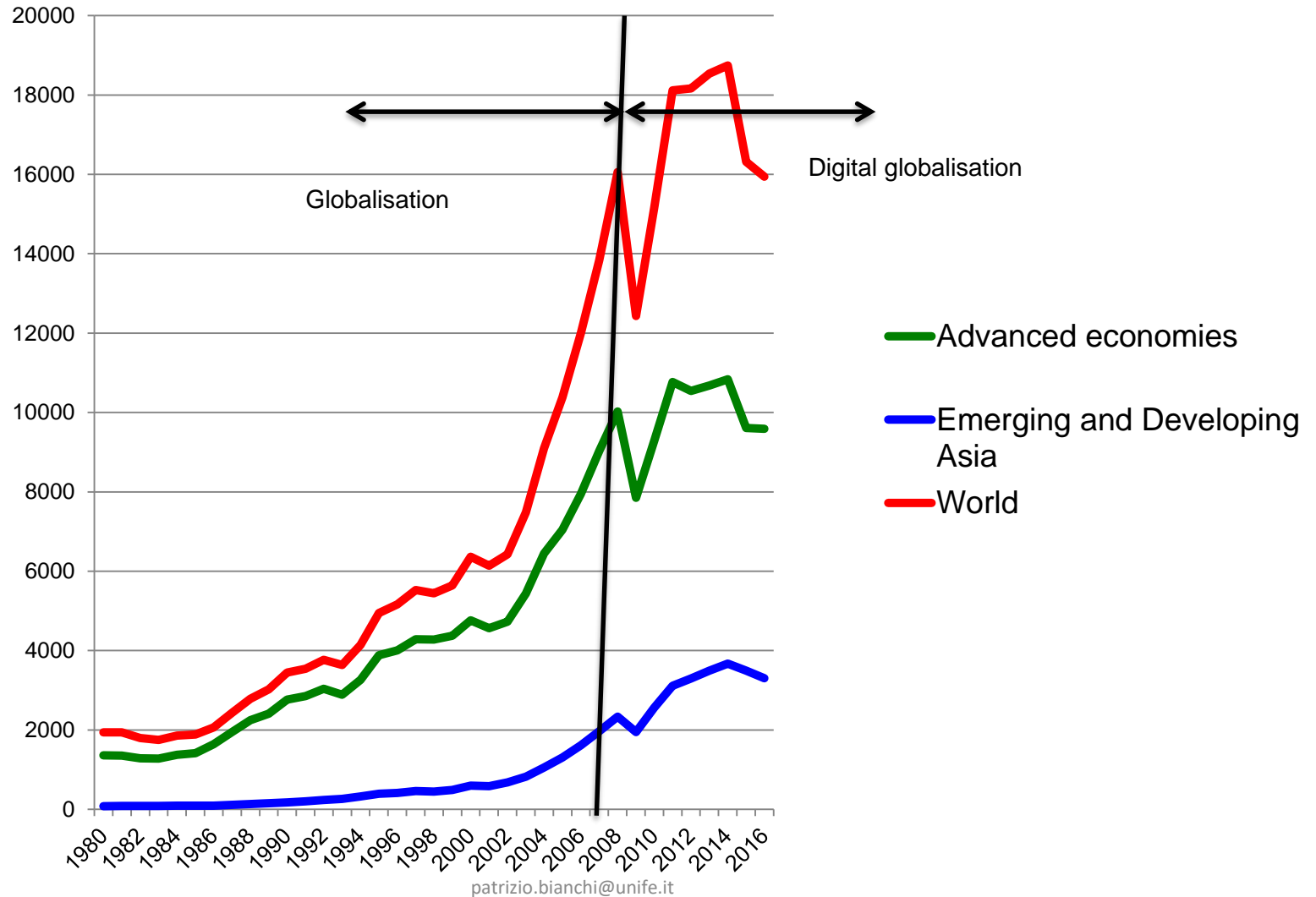


Scale and
upscaling
produzione

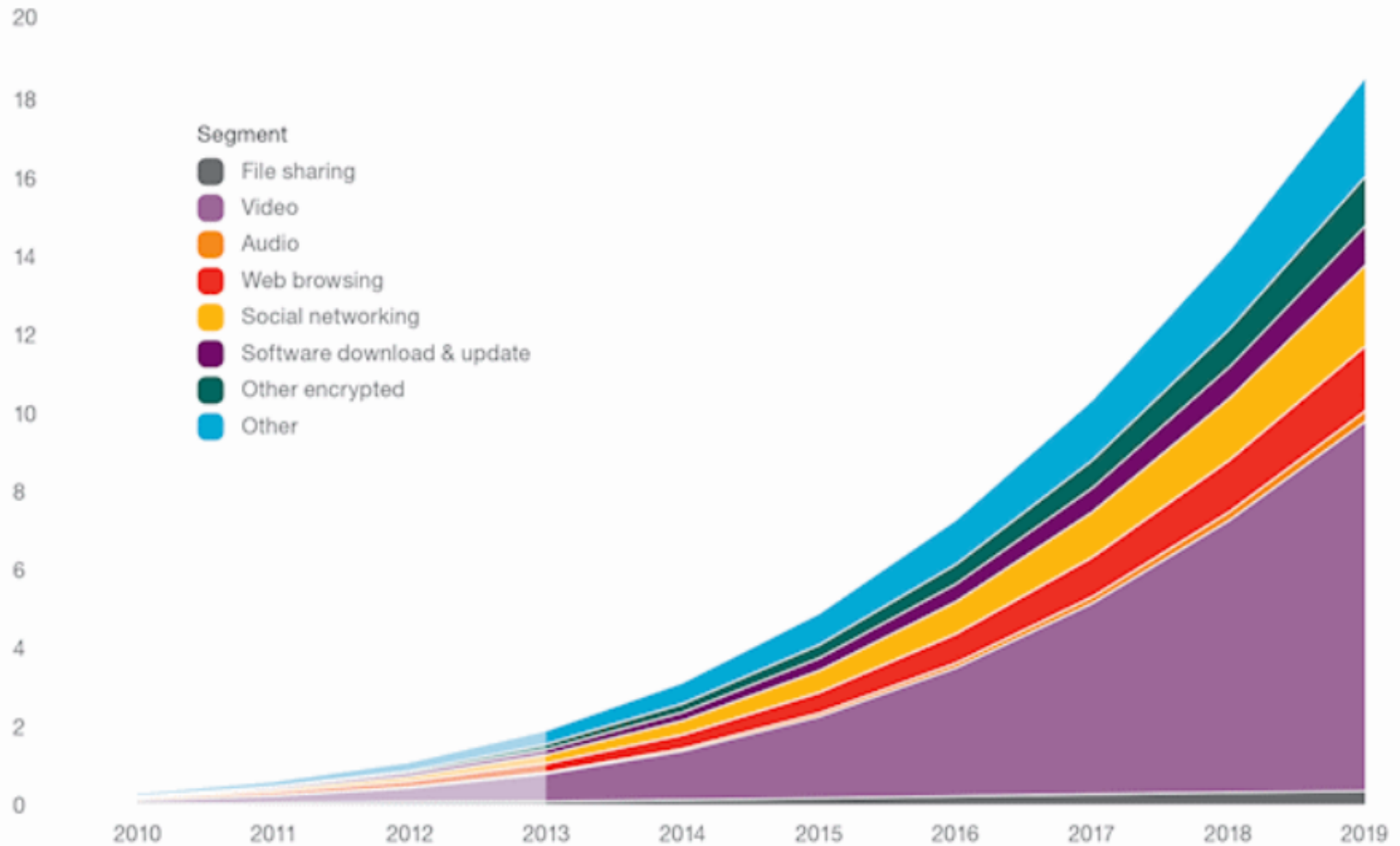


Dimensione della
rete di produzione
Dimensione della
rete di vendita

Export of goods annual billion US (fonte IMF)

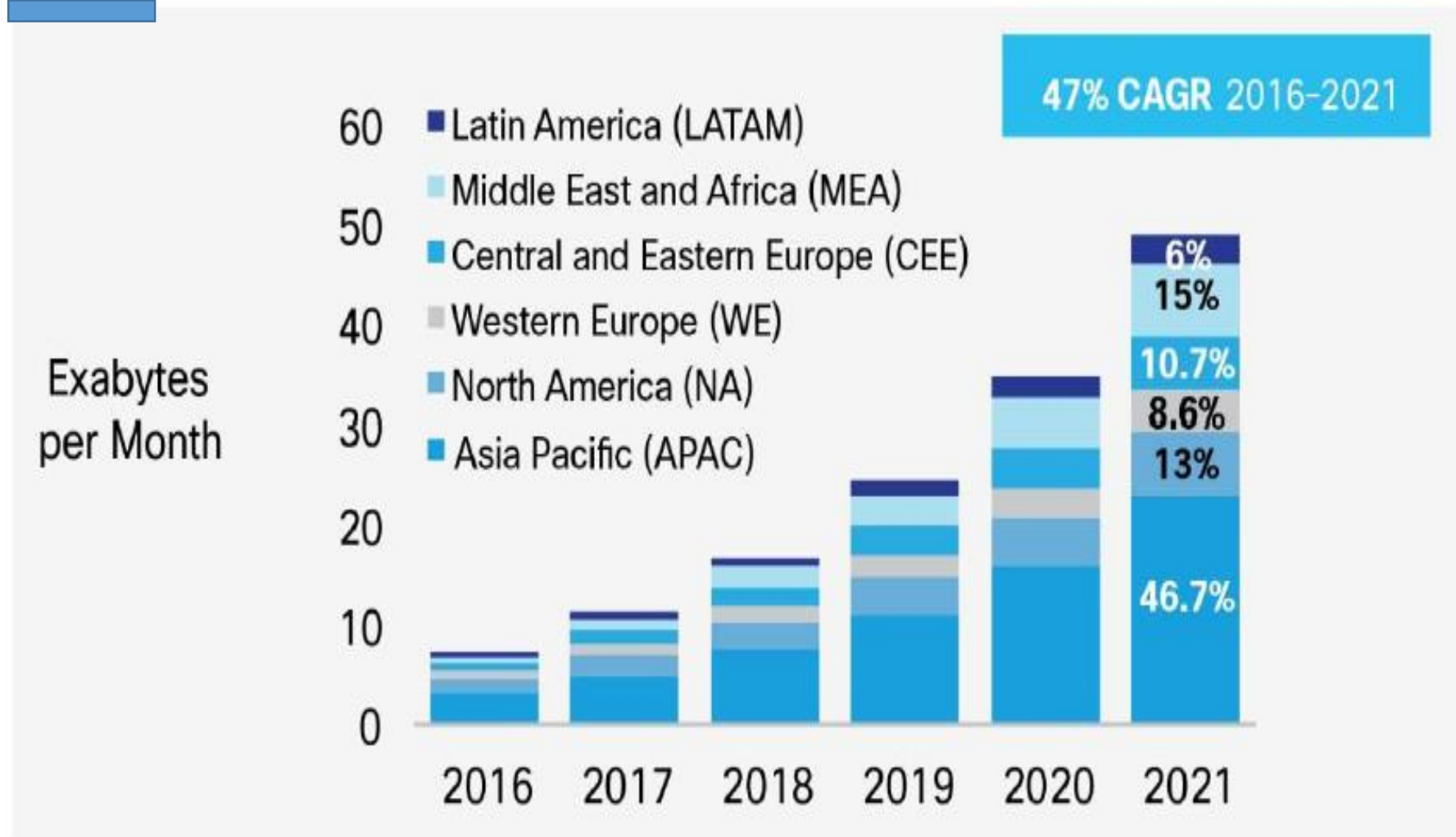


Mobile data traffic by application type monthly exabyte (Ericsson)



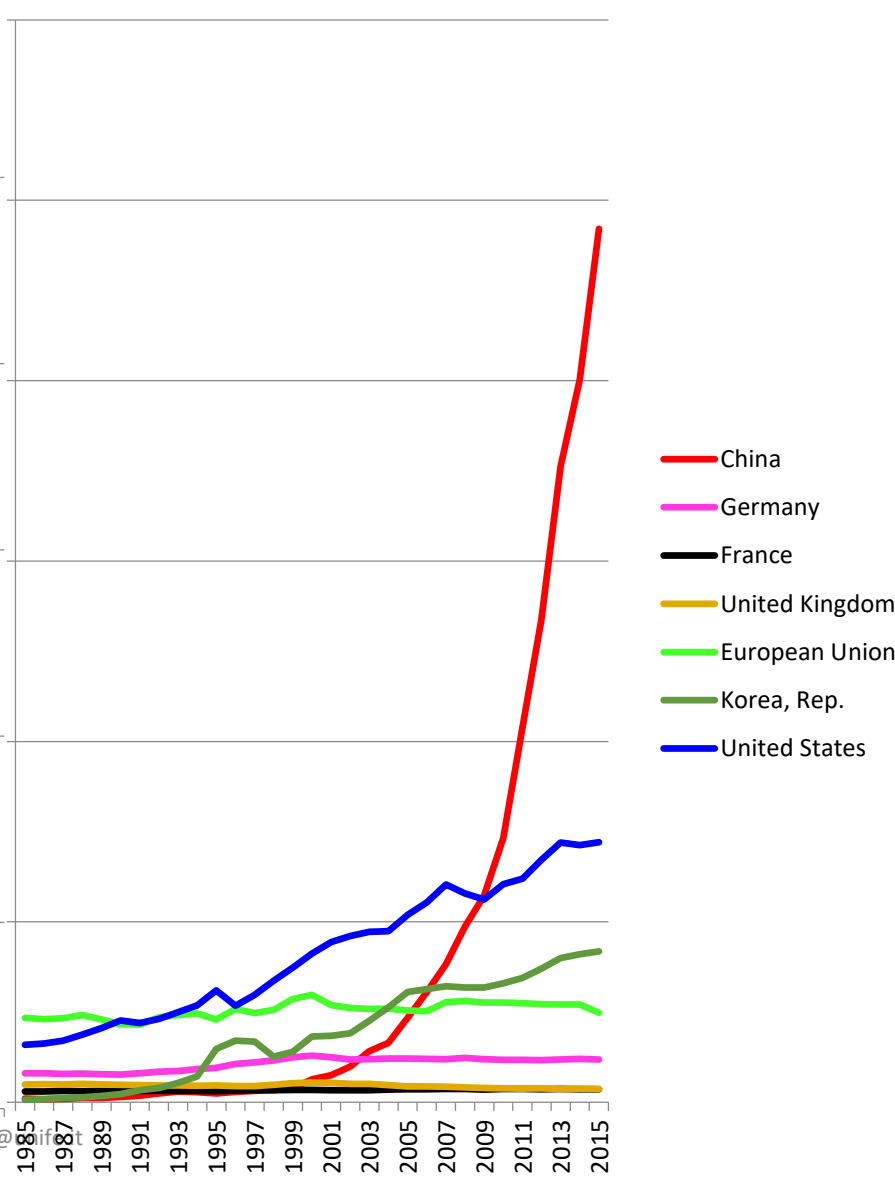
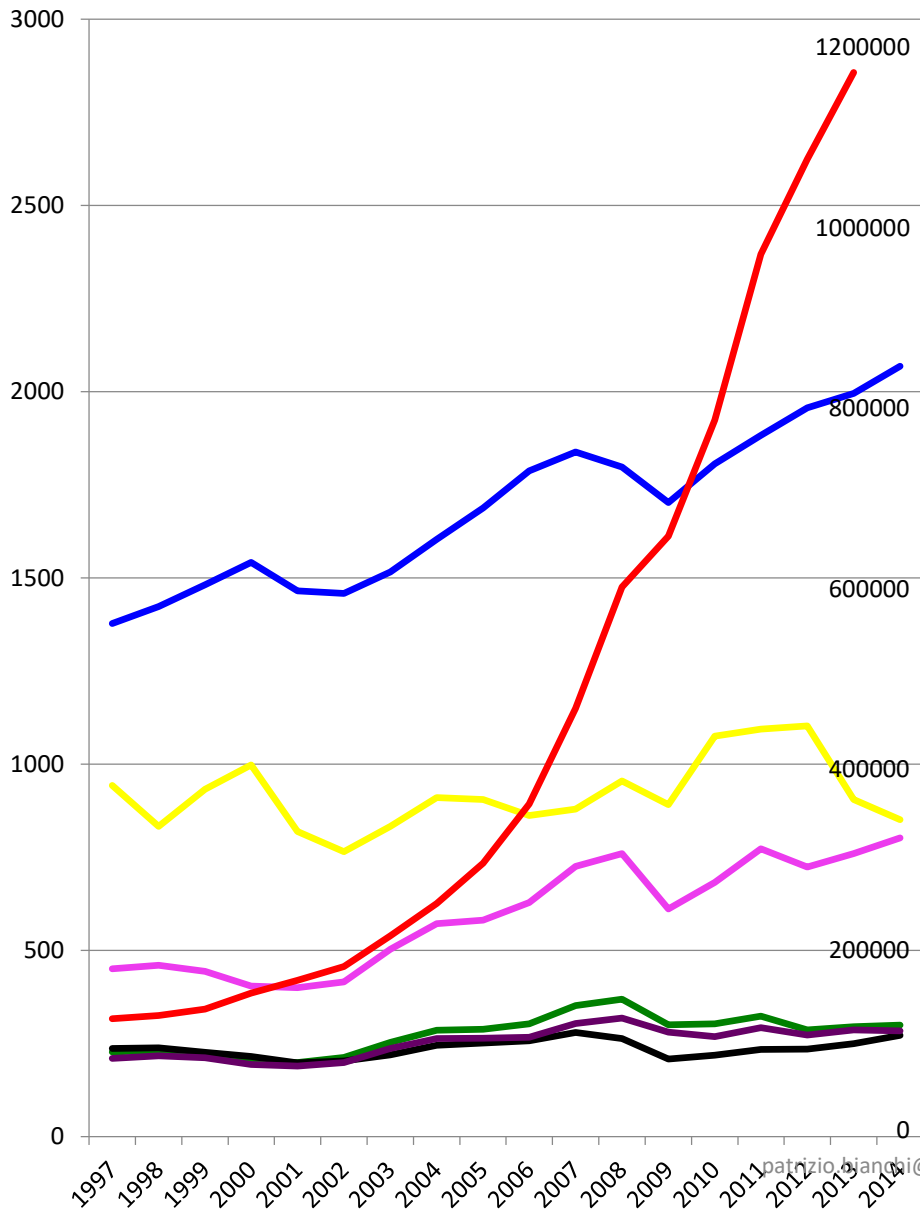
Global mobile data traffic forecast (fonte Cisco, 2017)

Traffic Forecast by Region



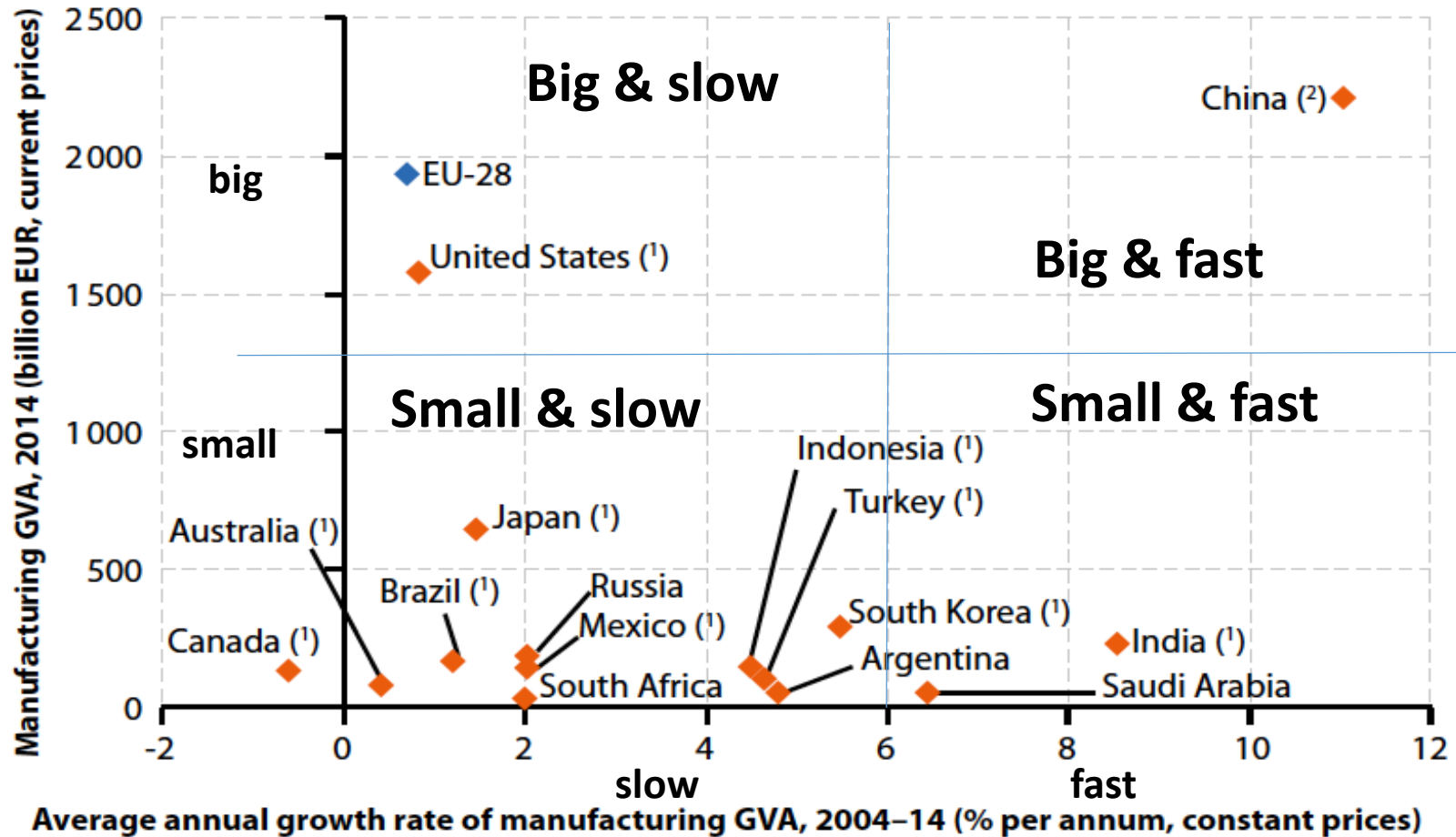
Manufacturing Value added, Current billion \$

Patent applications, residents, 1985 to 2015



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Manufacturing gross value and annual value rate of gross value added 2004 – 2014



Note: the EU-28's annual average growth rate between 2004 and 2014 of GVA for manufacturing activities was 0.7 % (shown on the horizontal axis). The EU-28 GVA was EUR 1 932 billion in 2014 (shown on the vertical axis).

(1) 'Manufacturing' excludes recycling and publishing activities.

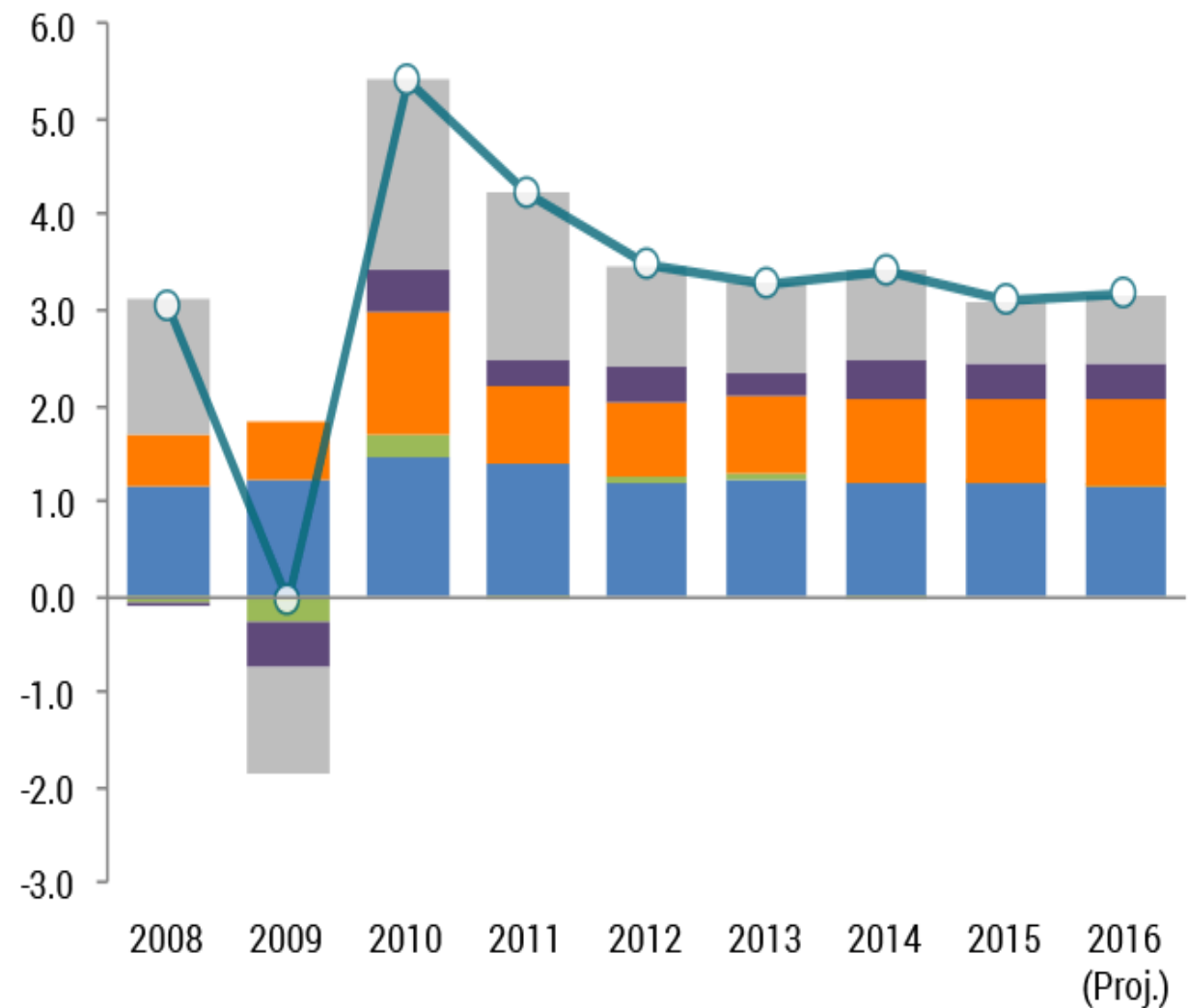
(2) At producers' prices for current prices series. 2005 data for constant prices series instead of 2004.

Source: Eurostat (online data code: [demo_gind](#)), United Nations, National Accounts Estimates of Main Aggregates and United Nations Population Division, Department of Economic and Social Affairs (World Population Prospects: the 2015 Revision)

Contribution to Global Growth 2008–16
(In percentage points)



- Others
- United States
- Rest of Asia
- Japan
- China
- World



Sources: IMF, World Economic Outlook; and IMF staff calculations.

Gli «Others» siamo noi

Le nuove infrastrutture
dello sviluppo

I nuovi settori dello sviluppo

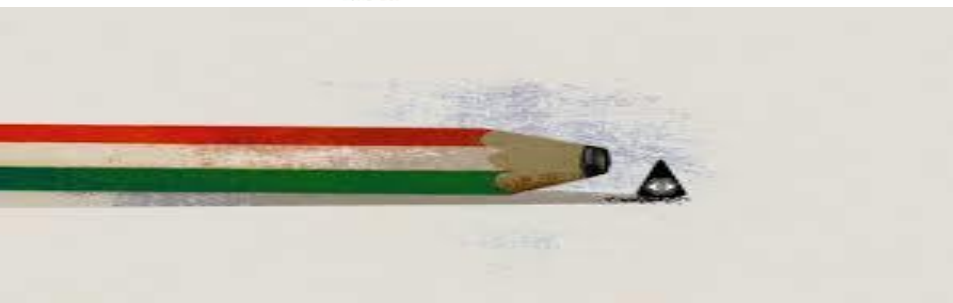
La nuova immagine dello
sviluppo



MADE IN ITALY



Basque Design Today



MADE IN ITALY





Dompé



IMA



INFN

IVVA



VISIT LAB

VISUAL INFORMATION
TECHNOLOGY LAB

CINECA

Istituto Nazionale
di Fisica Nucleare

Sustain Ability

Chiesi
RESPIRATORY



LIFE FROM INSIDE



EMILIA ROMAGNA BIG DATA COMMUNITY

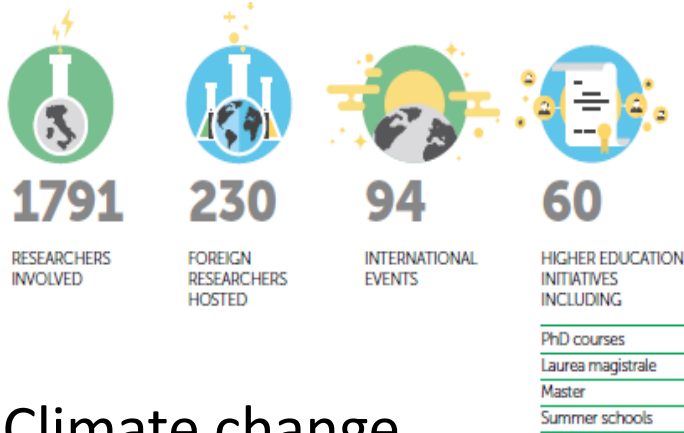
FROM
VOLUME
TO VALUE



The EMILIA ROMAGNA Big Data COMMUNITY

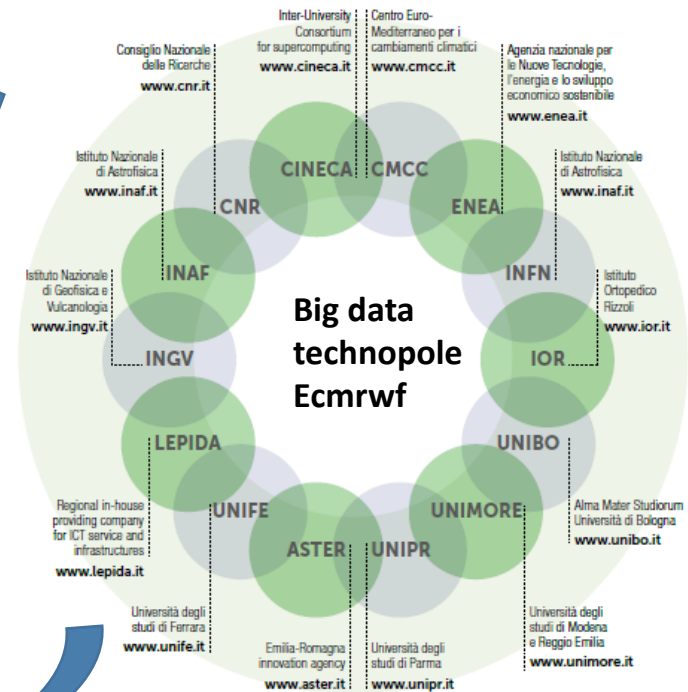
- The Emilia Romagna Region (ERR) is the National and European hub for big data: about the 70% of the Italian research data is stored/ processed in its research centre.
- Four top universities, the national university supercomputing consortium(CINECA) , the National Institute for Nuclear Physics (INFN) and other National research institutes have their tier one computing services and data centres in ERR
- ERR is the headquarters of world-leading companies in the sector: automotive, mechatronics, digital production, bio-medical, e-commerce, agrifood
- Emilia-Romagna is the 1° Italian region in terms of economic growth rate and one of the most dynamic regions in Europe

BOLOGNA BIG DATA COMMUNITY



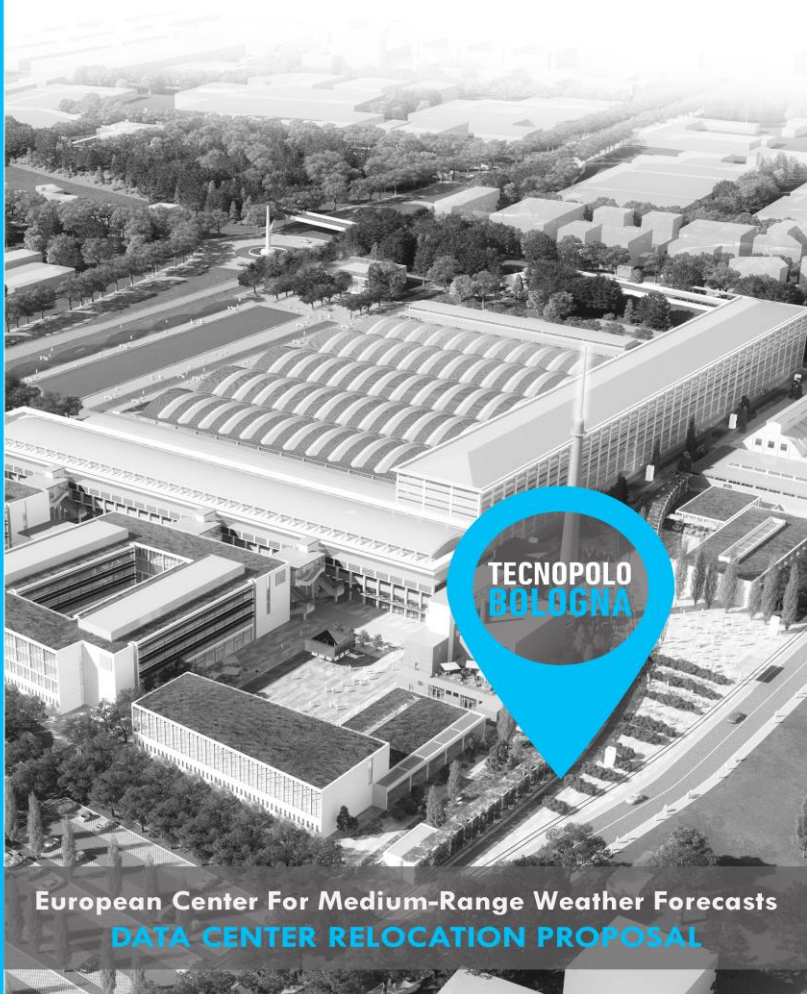
- Climate change
- Health and aging
- Production and innovation
- Humanities and society
- Sustainable cities
- Security and Cybersecurity
- education

Fundamental analytics and applications
Science, Industrial and society challenges





MINISTERO DELL'ISTRUZIONE DELL'UNIVERSITÀ E DELLA RICERCA



European Center For Medium-Range Weather Forecasts
DATA CENTER RELOCATION PROPOSAL

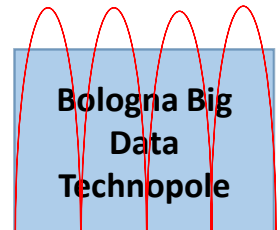
Bologna big data Technopole:

EUROPEAN CENTER FOR MEDIUM-
RANGE WEATHER FORECAST

INFN-CINECA Big Data Center

IBM center on Aging

Competence center Big Data for Industry



4 Universities, 11 campus

5 National Research organizations

Inter-university Computing Center (CINECA)

The Regional High Tech Network

10 Technopoles

88 laboratories/centres of industrial research

600 full time young researchers

1200 part-time researchers

800 High Tech Start ups





Muner

Motorvehicle University of Emilia Romagna

- The Regional Government promoted an association among the 4 universities and the motorvehicle companies working in ER
- University of Bologna, University of Ferrara, University of Modena and Reggio Emilia, University of Parma
- Ferrari, Alfa Romeo, Maserati, Lamborghini, Ducati, Dallara, Toro Rosso, Pagani, Marelli, Coxa
- For a joint Msc degree in Automotive engineering and Compumotive





Noio... volevam... volevàn savoir... Per andare dove vogliamo andare, dove dobbiamo andare