Employment and digitalisation: Working in the 21st Century

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From
Jacques Barthelemy and Gilbert Cette
“Travailler au XXIème siècle – L’uberisation de l’économie ?”, Odile Jacob - 2017

1. Introduction

- **The digital revolution**
  - **Strong growth potential** (Brynjolfsson and Andrew Mcafee, 2014 ; Bart Van Ark, 2016 ; Branstetter and Sichel, 2017 ; …)
  - We are at the **beginning of the process**: usually long time between first innovations and generalised effects (David, 1990 ; …)
  - **All activities will be affected**, and among the firsts: transport, finance, retail …
  - Can have **substantial impacts on productivity and therefore growth**, and then possible source of rising standard of living
  - But needs **appropriate institutions** (Brynjolfsson and McAfee, 2014 ; …)
  - Employment risks: **Manage the employment reallocation** (Sauvy, 1980)
- **Disrupts modes of life and work**
  - Like all technological revolutions
- **Creates two types of anxiety concerning employment**
  - '**Quantitative**' anxiety (employment evaporation)
  - '**Qualitative**' anxiety (salaried employment evaporation)

2. ‘Quantitative’ anxiety

- **‘Quantitative’ anxiety about employment evaporation**
  - Source of anxiety: massive destruction of employment and inevitable increase of unemployment?
  - This anxiety is old: Seen in all previous technological revolutions (Cf. J. Mokyr *et al.* (2015)
  - Thomas Mortimer (1772) previously expressed this
  - ‘*Luddism*’ or ‘*neo-luddism*’: Destruction of machines in British textile industry in 1811-1812 (cf. Edward P. Thompson, 1963, and others)
  - John Maynard Keynes (1930): Massive job destruction or 15 hour working week in 100 years (3 hours x 5 days per week). “*For three hours a day is quite enough to satisfy the old Adam in most of us!*” https://assets.aspeninstitute.org/content/uploads/files/content/upload/Intro_and_Section_I.pdf
  - …

2. ‘Quantitative’ anxiety

- **Paradoxically during a period of low productivity gains**

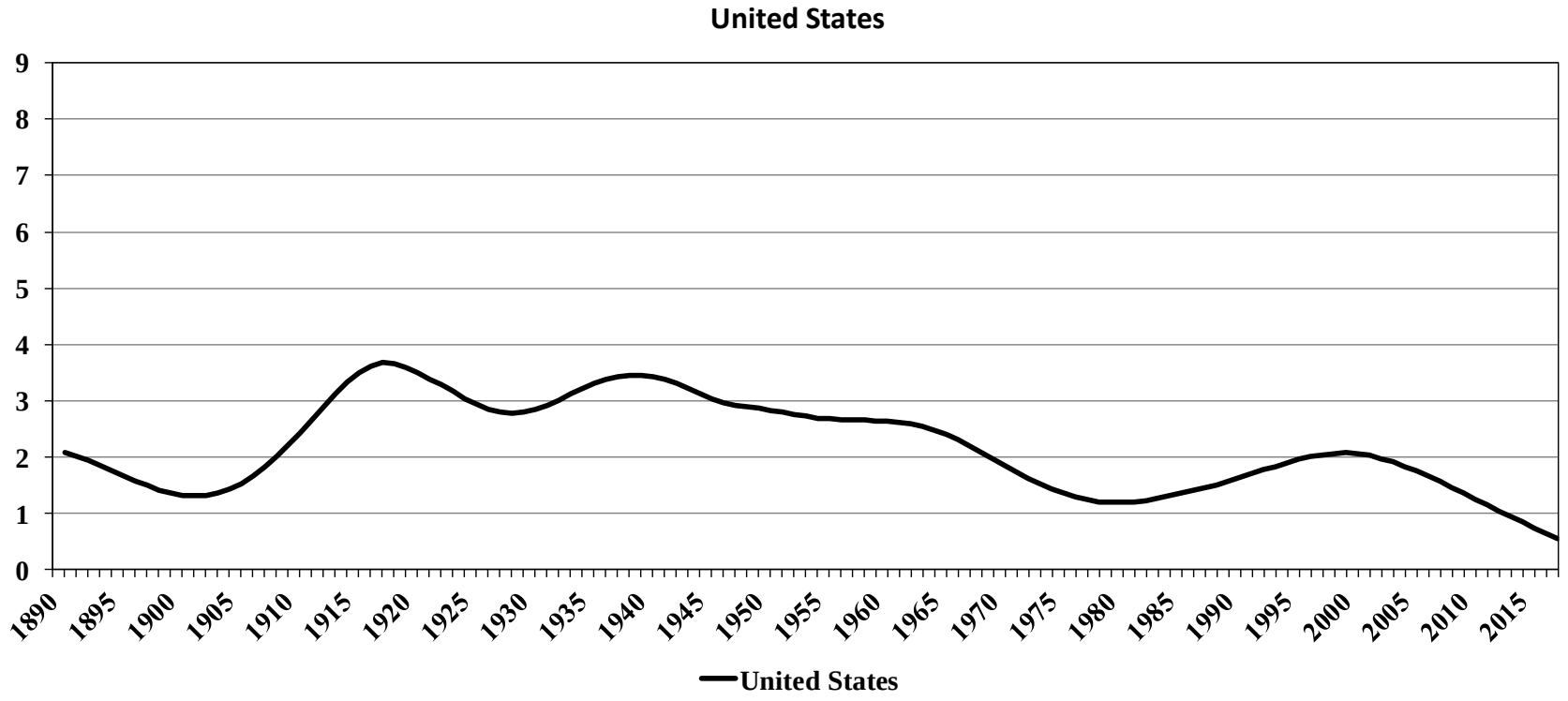
Average annual growth rate of hourly labour productivity
Over different sub-periods – Whole economy – 1891-2018 – In %
Source: Bergeaud, Cette and Lecat (2016) - Cf.: www.longtermproductivity.com

	United States	Euro Area	Japan	United Kingdom	Canada	Germany	France	Italy
1890-1913	1.57	1.71	2.32	0.78	2.30	1.87	1.84	1.54
1913-1950	3.09	1.18	1.79	1.35	2.17	0.20	1.79	2.56
1950-1975	2.33	5.43	7.13	3.27	2.94	5.78	5.28	6.00
1975-1995	1.30	2.71	3.22	2.66	1.12	2.95	2.59	2.66
1995-2005	2.40	1.24	1.91	2.19	1.57	1.92	1.94	0.50
2005-2018	1.00	0.67	0.73	0.45	0.79	0.70	0.52	0.05

- But **anticipation of a huge shock**, linked to digitalisation, robotisation and artificial intelligence

2. ‘Quantitative’ anxiety

Average annual growth rate of labor productivity per hour
Smoothed indicator (HP filter, λ = 500) **- Whole economy – 1891-2018 – In %**
Source: Bergeaud, Cette and Lecat (2016) - See: www.longtermproductivity.com



- US: one big wave over the XXth Century, pause during Great Depression, small wave between 1995-2005
- Huge slowdown from the 2000s : **Risk of *Secular Stagnation*?**

2. ‘Quantitative’ anxiety

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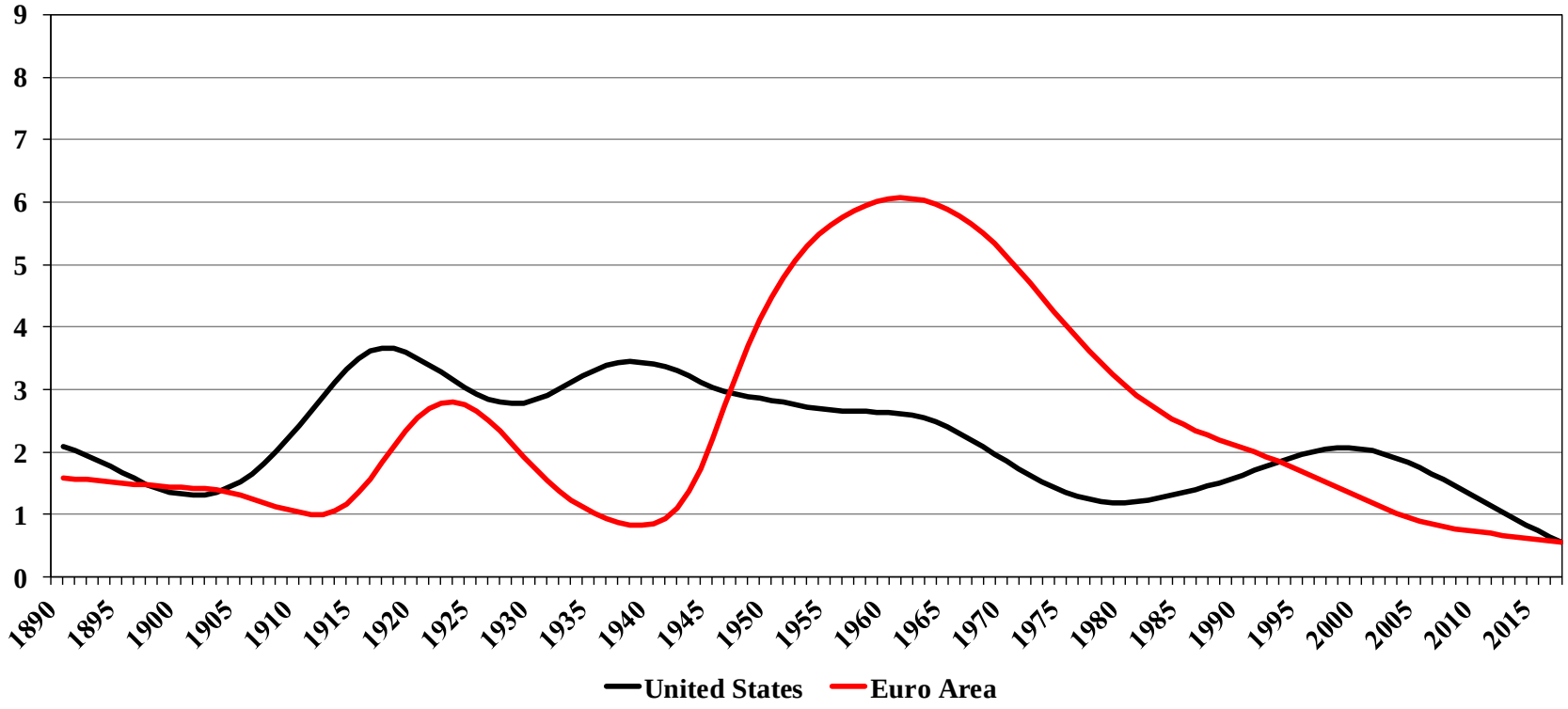

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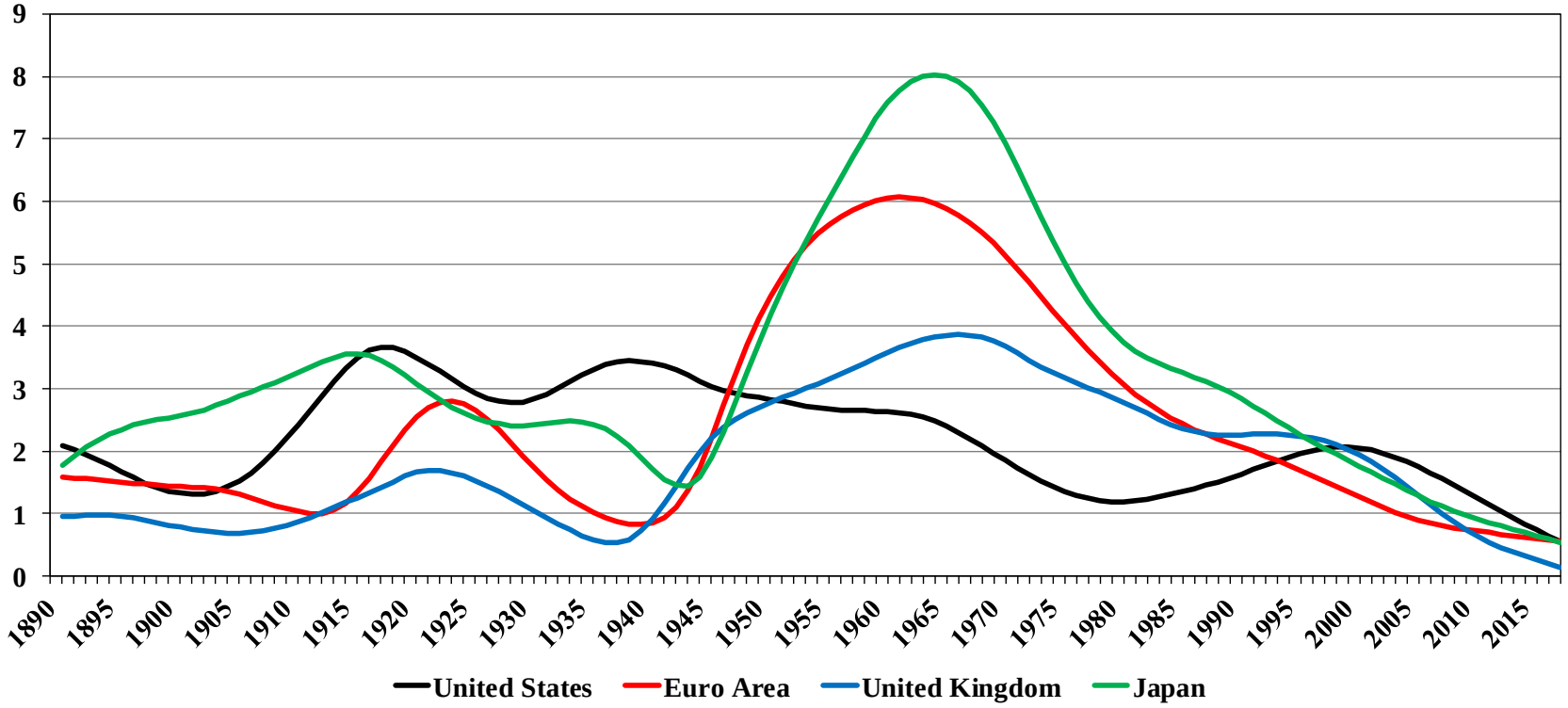

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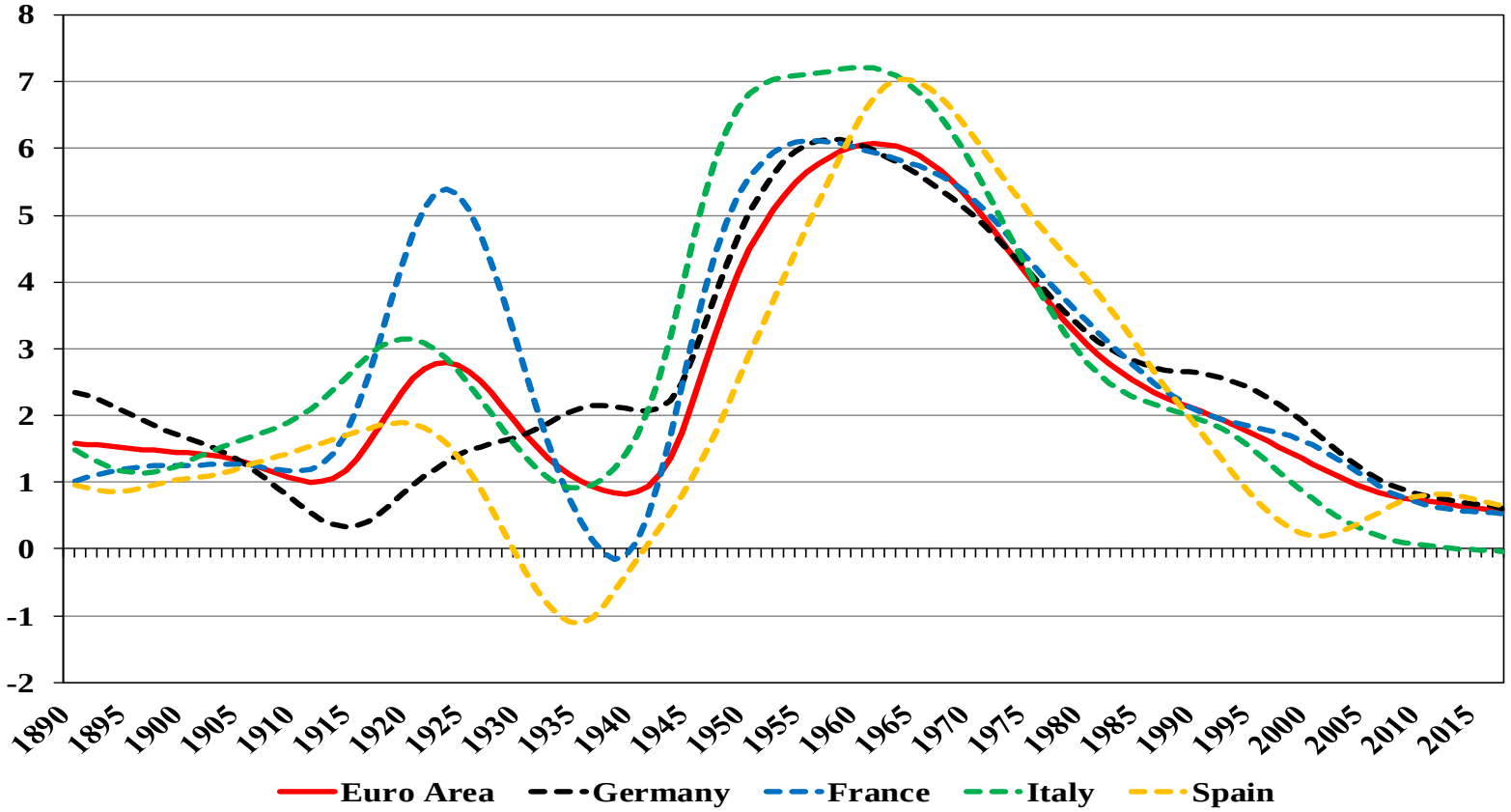


- US: one big wave over the XXth Century, pause during Great Depression, small wave between 1995-2005
- Other countries: delay for the big wave, no small wave except for the UK
- Huge slowdown from the mid 2000s in the all areas : **Risk of *Secular Stagnation*?**

2. ‘Quantitative’ anxiety

- **The digital revolution**
  - Strong potential (Bart Van Ark, 2016; Branstetter and Sichel, 2017; …)
  - Long time lag usually from initial innovations to generalised impact (David, 1990; …)
  - First activities directly concerned: transportation, financial activities, retail… All activities will be impacted in one way or another…
  - But need adapted institutions (Brynjolfsson and McAfee, 2014; …)
  - Employment risks: to manage the workforce transfers

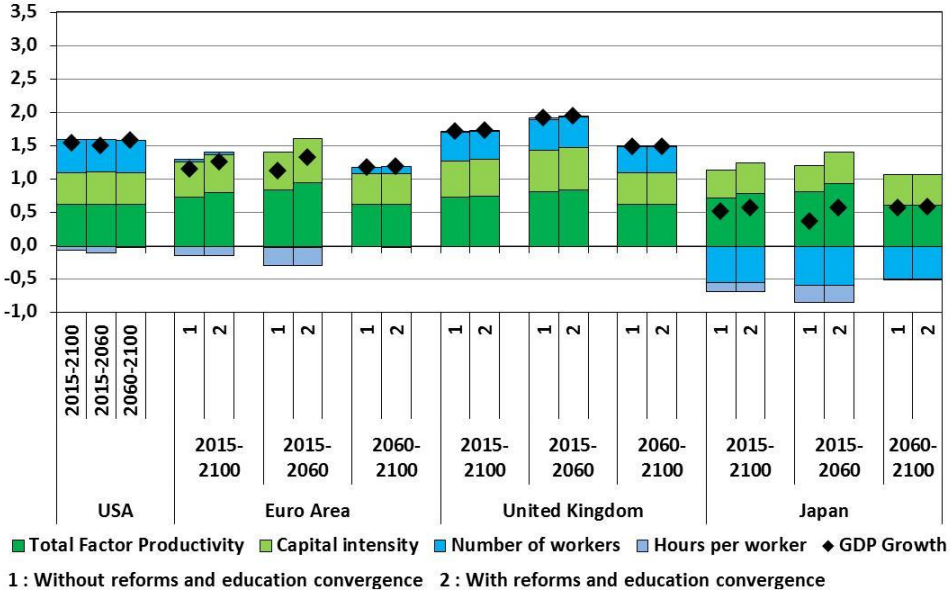
2. ‘Quantitative’ anxiety

➢**Very different possible long-term scenarios**

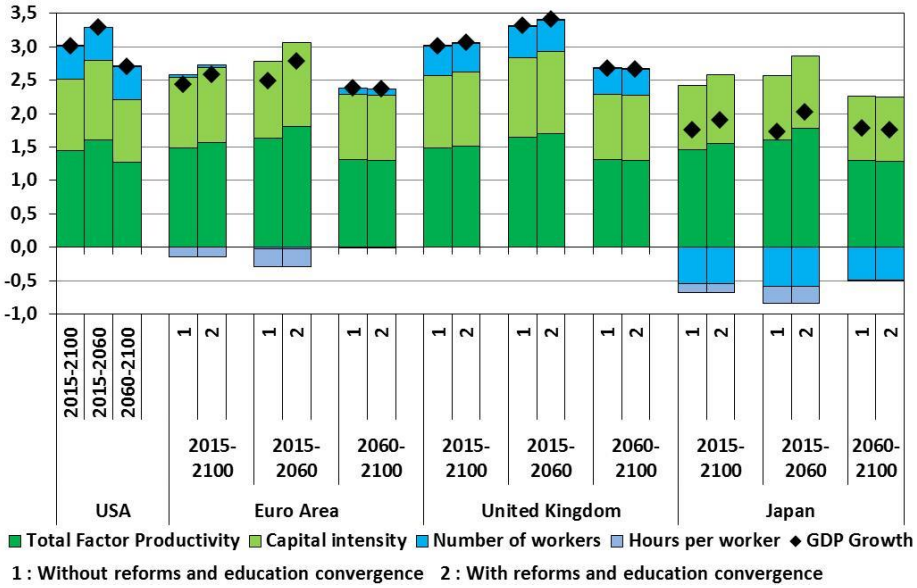
Source: Cette, Lecat and Marin (2017) - See: www.longtermproductivity.com

Average annual GDP growth (in %) and contributions (in pp)

Scenario: « Secular stagnation »



Scenario: « Technology shock »



- The « technology shock » scenario would allow us to face the *headwinds*
- Over the long term, necessity to take into account the environmental risk (climate change, energy, …)

2. ‘Quantitative’ anxiety

- **Massive job destruction from digital shock: no consensus in the literature**
  - **‘*Massive*’ scenario**
    - Frey and Osbourne (2013, 2017): about 50% of jobs in the US (30% to 40 % in the UK) could be replaced by computers or algorithms in the medium term (over 20 years)
      High risk: major retailers, lower level white collar workers, …
      Medium risk: construction, local retailers, road transportation
      Low risk: health, education, scientific professions, …
    - McKinsey (2015, 2017): similar scenario
  - **‘*Moderate*’ scenario**
    - Arntz, Gregory and Zierahn (2016): about 9% of jobs threatened in the medium term in developed countries

2. ‘Quantitative’ anxiety

- ***‘Gross’* jobs destruction: previously seen, and ‘*total’* has not decreased**
  - ***Gross* job destruction has always accompanied previous technological revolutions**
    For example: agricultural employment contraction during the 19th and 20th centuries
    Disappearance of water carrying (A. Sauvy, 1980) and of the ‘*poinçonneur des lilas*’ sung by Gainsbourg
  - **Other jobs appeared and working time decreased**
    . Massive job creation in services during the 20th century
    . Annual working time was divided by a factor close to two during the 20th century
    . Anxiety about massive net job destruction was always contradicted by the facts (Cf. J. Mokyr *et al.*, 2015)
    . Productivity gains financed the two types of standard of living improvement: economic (purchasing power) and leisure (working time decrease)

2. ‘Quantitative’ anxiety

- **Massive *gross* job losses: as already seen, and total employment didn’t decrease**
  - But we have to deal with job transfer (The ‘*reversement*’, A. Sauvy, 1980)
    And learn to use the new digital technologies
  - Some previous **‘*solutions*’ must be abandoned**
    For instance the pre-retirement of the years 1950-1980 : expensive and wasteful
  - **Need for agility of training systems** (initial and et professional)
    Otherwise, higher risks
  - **Net job creation to come in numerous activities**
    . Autor (2015): personal services
    . Mc Kinsey (2018): computing and programming (90% increase of the needs, until 2030), personal services, leisure, …
  - **Emerging activities are often poorly anticipated**
    . Need for responsiveness of training systems

2. ‘Quantitative’ anxiety

- **My own view is quite optimistic**
  - The digital revolution is an **historical opportunity** that we must not miss
  - The productivity acceleration from it is the **only easy financing source of the *headwinds*** that we face: ageing population, State dis-indebtedness, environmental investment... And expectations of purchasing power gains (cf. French yellow jacket movement).
  - To miss this opportunity would condemn us to a downgrading process (to become the Argentina of the XXI century).
    Without this financing source, our social model (and further, democracy itself…) would be under threat.

3. ‘Qualitative’ anxiety

- **A first risk of job polarisation?**
  - Since the 1980s, technical progress would have destroyed routine jobs more than unskilled ones
    Decline of the share of the median remuneration and increase of both high and low
    Autor and Handel (2013), Goos, Manning and Salomons (2014), Autor (2015)
    Catherine, Landier and Thesmar (2015): same observation for France
  - **This development is not only linked to digital**. Also linked to:
    . The increase of unskilled jobs (with strong incentives)
    . The increase of inequality
  - **Decrease in demand for cognitive skills during the 2000s in the US** (Beaudry *et al*., 2013)

3. ‘Qualitative’ anxiety

- **A first risk of job polarisation?**
  - **Consensus concerning a decrease of median remuneration**
  - **No consensus in the litterature concerning unskilled jobs**
    - The most affected by gross destruction would be associated with low salary and low skill levels (Furman and Seamans, 2018), with a decrease of low-skilled worker’ employment rate (Graetz and Michaels, 2018). risk of increase in inequalities
    - No impact on the share of unskilled jobs (Jerbashian, 2019)
  - **Continuous increase in training levels of workers**, especially for the less skilled, within all OECD countries (Barthelemy and Cette, 2017)

3. ‘Qualitative’ anxiety

- **A second risk of *uberisation* of the economy?**
  - **Self-employment would develop to the detriment of salaried jobs**
    With, for much self-employment, a mediatisation via platforms
  - **Anxiety creating** because self-employment benefits of lower protection, compared to salaried jobs, in different fields:
    . Social protection (unemployment benefits, …)
    . Separation (disconnection without legal recourse, …)
    . Remuneration (no minimum wage, …)
    . Working conditions (no maximum working time, …)
    . Financial risks (provide their own working tools, …)
  - But this **risk was contradicted by statistical data**

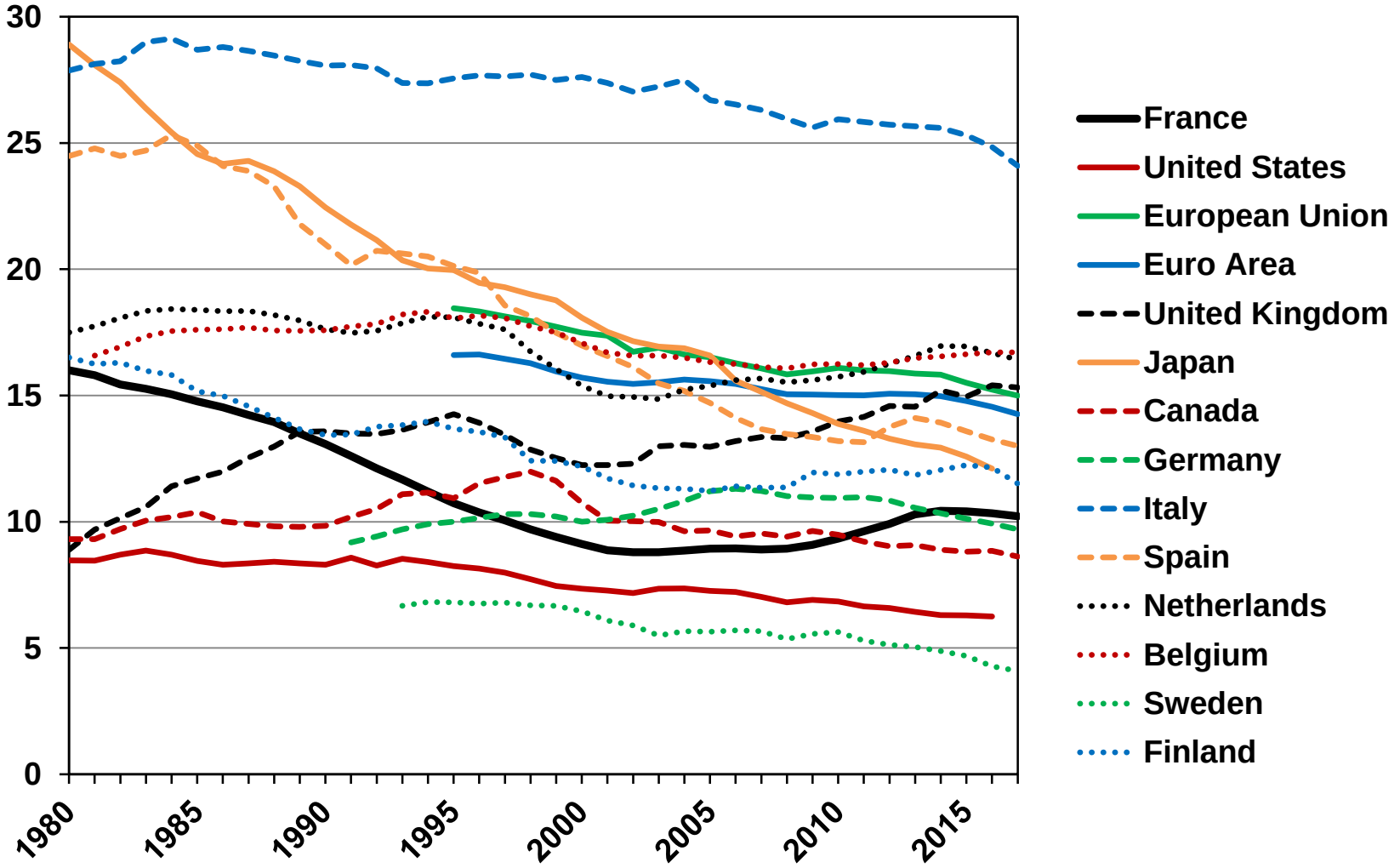
    Among the 36 OECD countries, the share of salaried employees declines in only 3 countries over the last two decades: France: + 1.¼ pp (creation of the autoentrepreneur status; The Netherlands: + 2 pp, United-Kingdom: + 3 pp
  - **Salaried employee remains the dominant working status**

3. ‘Qualitative’ anxiety

- **A second risk of *uberisation* of the economy?**

Share of self-employment of the total employment in developed countries

In% - Source: OECD



3. ‘Qualitative’ anxiety

- **But profound changes within self-employment in developed countries**
  Barthelemy and Cette (2017)
  Two types of self-employment developed
  - **Low-skilled jobs**
    . Workers with low education levels, low autonomy (transport, delivery…)
    . Jobs often through digital platforms
    . These jobs will disappear (driverless vehicles, …)
  - **High-skilled jobs**
    . Workers with high education levels, high autonomy (professional/advisory, …)
    . Intensive use of mobility tools (ICTs)
    . Integration of professional and personal lives (including family life)
    . Modes of work similar to those of the most qualified employees
- **The current situation is not acceptable because of the low protection for low-skilled self-employed jobs compared to employees**

4. What can be done?

- **Three *scenarios*:**
  - ***Laissez-faire***
    - Inequitable
    - Difficult because of reclassification of self-employed workers as employees (California, 2015; London, October 2016; …)
    - In France? Complex jurisprudence, ongoing court cases, …
  - **Reclassification of self-employed workers as employees**
    - Inefficient: Means including in a category created for the factory model some types of jobs which involve specific flexibilities
    - Not desired by many self-employed
  - **<u>Create a new professional activity legal code</u>**

    To go from a situation in which rights are linked to a juridical subordination (characterised in the employment contract)

    To a situation in which these rights are linked to an economic dependency (subordination)

    Barthelemy and Cette (2017)

4. What can be done?

- **Central role of collective bargaining in the third scenario**
  - To define
    - The levels of economic dependence and autonomy of workers
    - The associated rights
  - Threshold regulations could be defined in this new professional activity legal code
    It could be possible to replace them with **thresholds defined through collective agreements** (suppletivity of the superior level rules, in the logic of the new labor ordinances)