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GLOBAL MACRO & THEMATIC  
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# GLOBAL GREYING



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# Global Greying - summary

Explosive worldwide growth in the working-aged population has paid immense dividends over the last four decades in the form of unprecedented expansion in global production capacities and savings. But the life cycle moves on. Yesterday's young labour force and savers are set to become legions of elderly people in mature economies but also the most influential countries of the developing world.

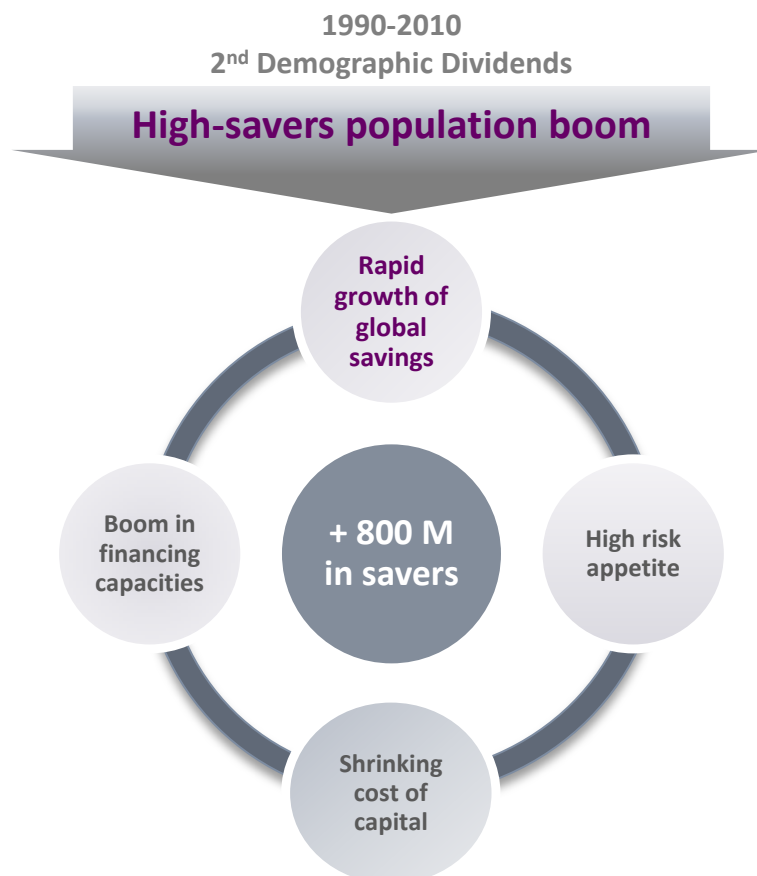
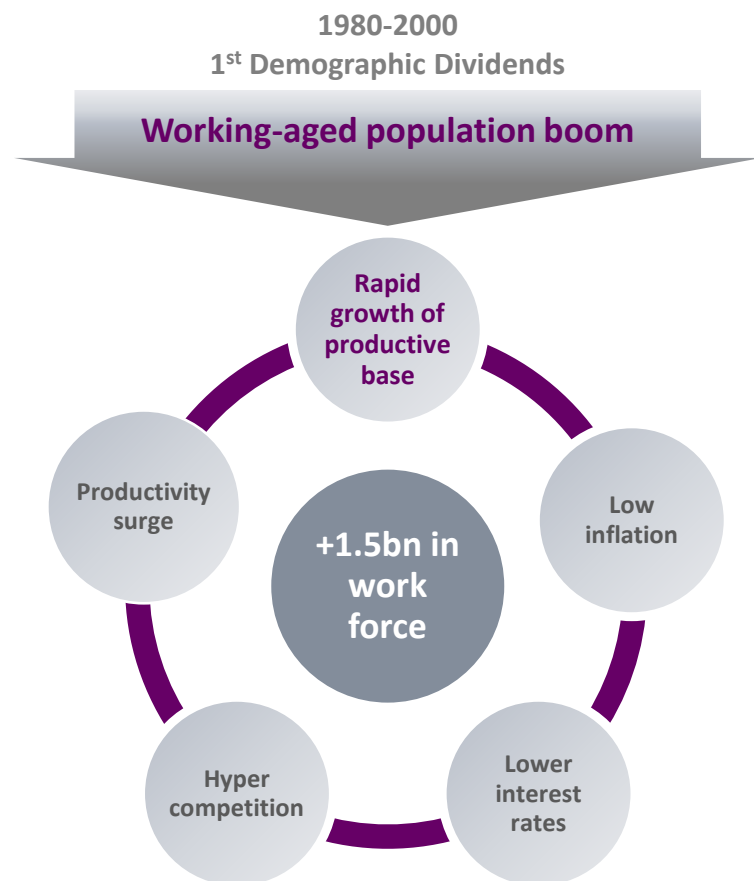
What does this mean for the next super cycle of growth, productivity and our ability to feed future generations with the required resources? What are the implications for policy makers, central banks and the geopolitical environment? How will savings, the cost of capital and asset prices be affected in the long run?

**Demographics: an essential issue for fund managers.**

- Since WWII, demographic changes have fuelled unprecedented labour growth with immeasurable economic effects.
- The latest wave of this demographic growth has been concentrated in Asia, a region of the world in which the working age population has grown by two billion individuals in less than forty years.
- Economic shake-ups that have resulted from this growth have shaped a new world, and created much new productive offer at a pace never seen before in History.
- The demographic changes that are now underway are causing sea changes whose effects are likely to completely overturn this model in the near future.

# The Global Economy 1985-2005: First, a Story of Demographic Dividends

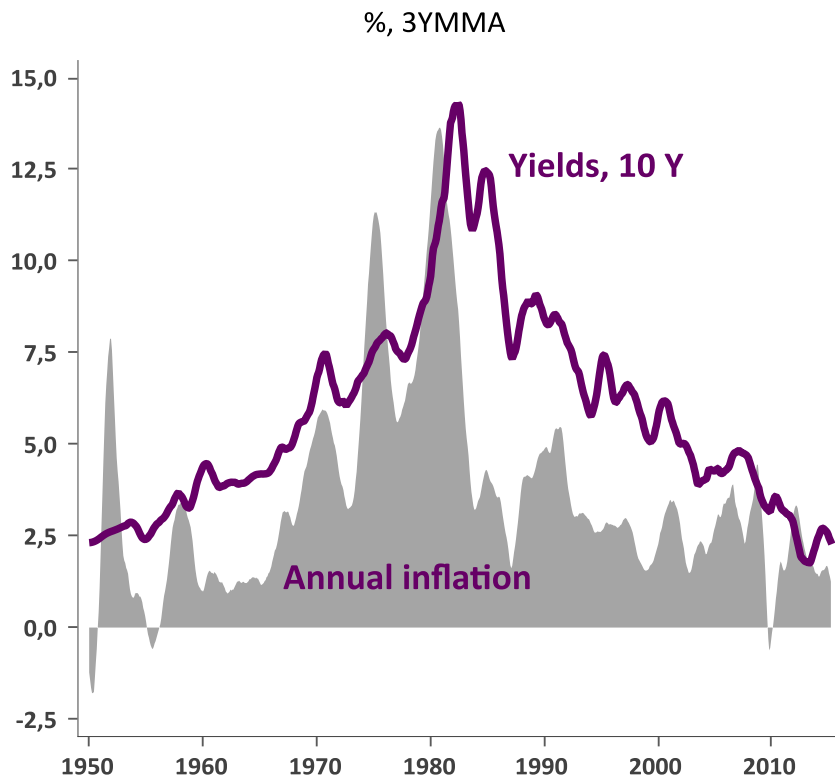
Immense dividends from the changing demographic pattern have shaped the economic regime that has provided prosperity worldwide over the past three decades





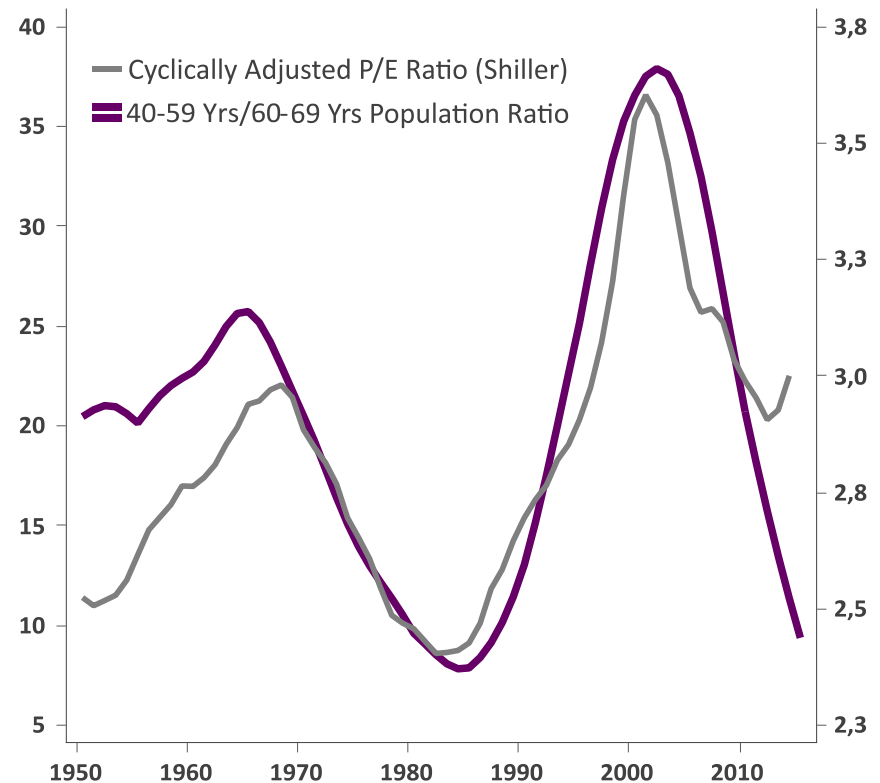
# Demographics, an Essential Factor Behind “the Great Moderation” that Drove Markets and Wealth Trends

## US Inflation and 10 yr Gvt yields



Sources : RichesFlores Research, Macrobond

## US High/Lower Savers ratio and S&P PE Ratio



Sources : RichesFlores Research, Macrobond

# Most demographic benefits have now been used up

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- **World population is still expected to grow by a considerable amount of +/- 2.5bn over the next three decades, from 7bn to 9.5bn, but:**
  - i. This will not be enough to keep the annual growth rate of the world population intact. Demographic growth is expected to halve from 1.5% p.a. over the past 40 years to 0.8% p.a. to 2050.
  - ii. Seniors (65+) are expected to make up 40% of this move.
  - iii. Working age population would only rise by 1.5bn, the same amount as during the past three decades but a corresponding rate of growth shaved from 75% to 35%
  - iv. As yesterday's savers spend their nest eggs, they will be replaced by a new generation of savers from countries that are currently among the world's poorest (India, sub-saharan Africa).

# Ageing: how serious is it?

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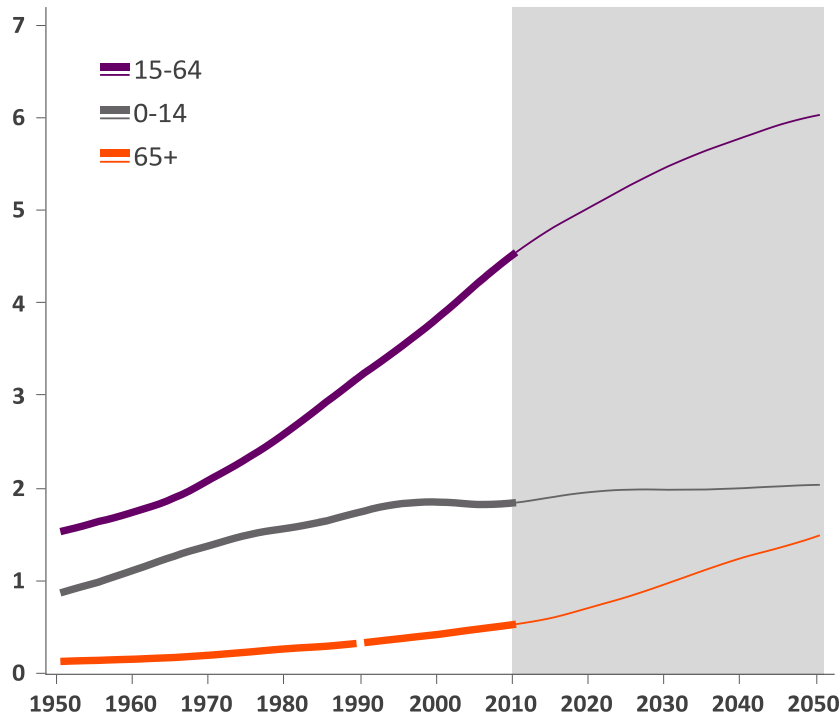
- **The ageing of the population is not a concern for the distant future or limited to wealthy countries only:**
  - The process is already taking shape in the majority of countries around the planet where the lion's share of global productive resources are located.
- **The disruptions that are liable to come along with the ageing population are just as serious as the changes that resulted from the unprecedented abundance of a population of young workers, above all:**
  - Scarcity of labor and savings resources, the evolution of which will determine the development of supply potential.

# 2010-2050: the Great Shift

Slowing growth of working aged population,  
surging grey population

## World Population by Age Group

In billions

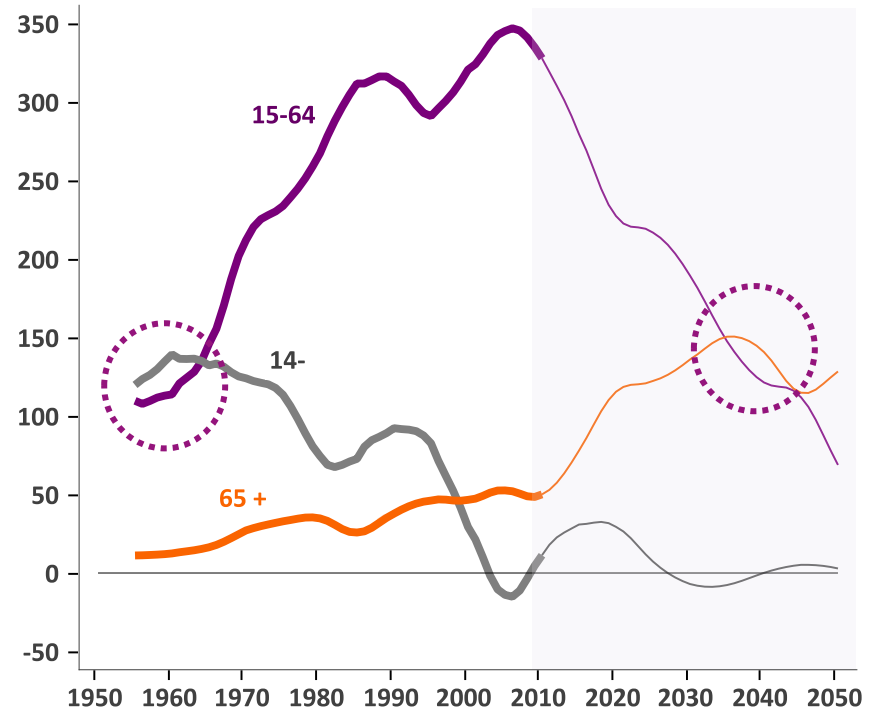


Sources: RichesFlores Research, Macrobond

Young people to gradually be replaced by  
the 65+

## Global Population Growth By Age Category

5Y growth, in millions



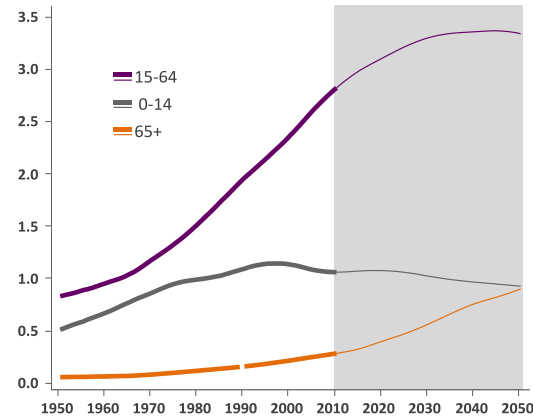
Sources : RichesFlores Research, Macrobond

# Population by Age Group, Main Regions

Peak in the working age population, falling or stagnant number of children, increase in the number of seniors: an aging process affecting everyone except Africa

## Asia

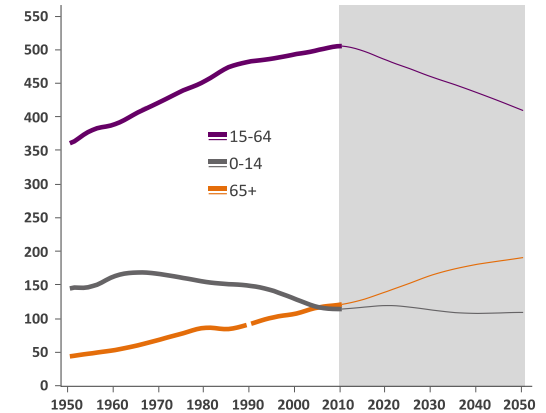
In billion



Sources: RichesFlores Research, Macrobond

## Europe

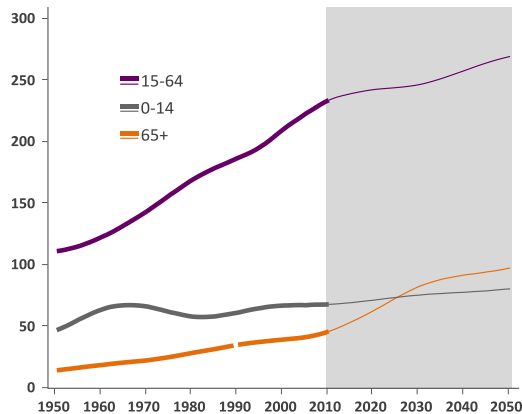
In million



Sources: RichesFlores Research, Macrobond

## North America

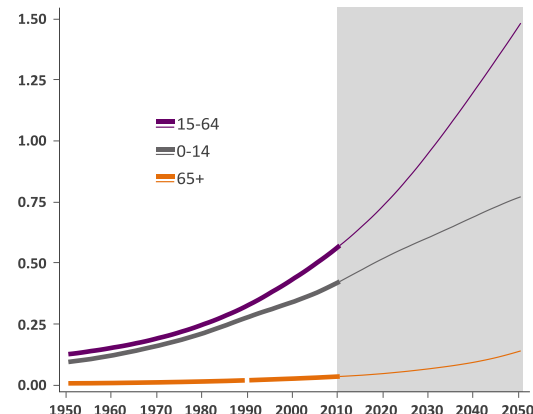
In million



Sources: RichesFlores Research, Macrobond

## Africa

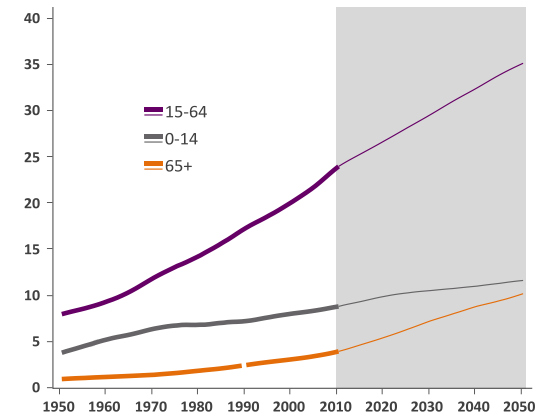
In billion



Sources: RichesFlores Research, Macrobond

## Oceania

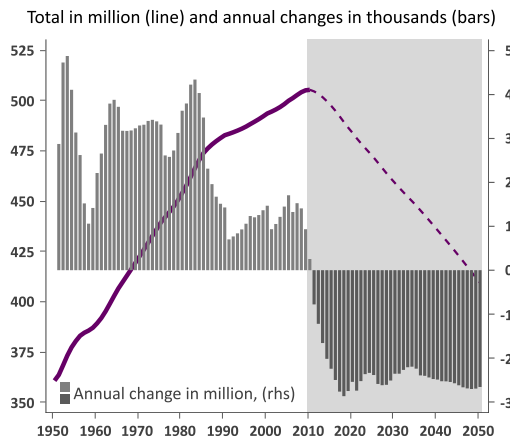
In million



Sources: RichesFlores Research, Macrobond

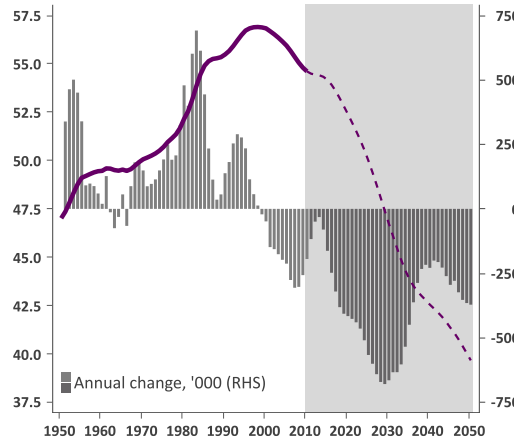
# Among advanced countries, Europe is the most exposed after Japan, albeit France and the UK look safer

## Europe Working Age Population



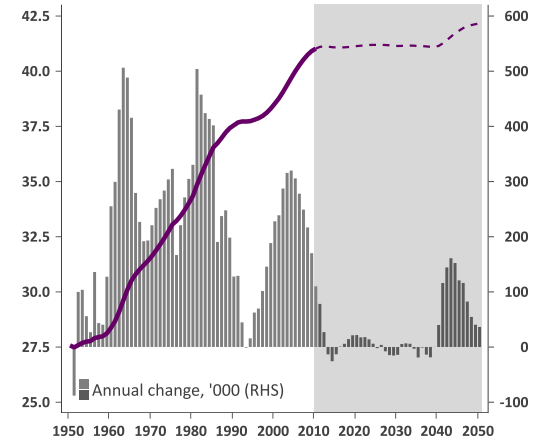
Sources: RichesFlores Research, Macrobond

## Germany



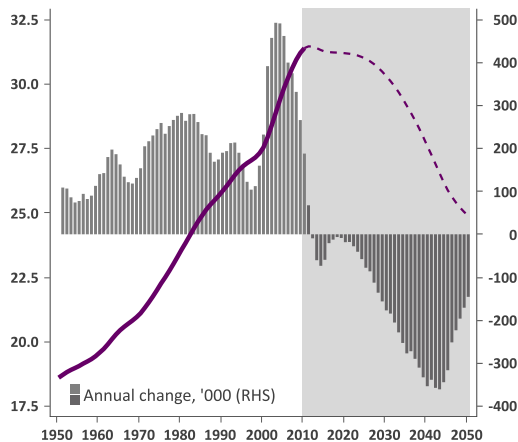
Sources: RichesFlores Research, Macrobond

## France



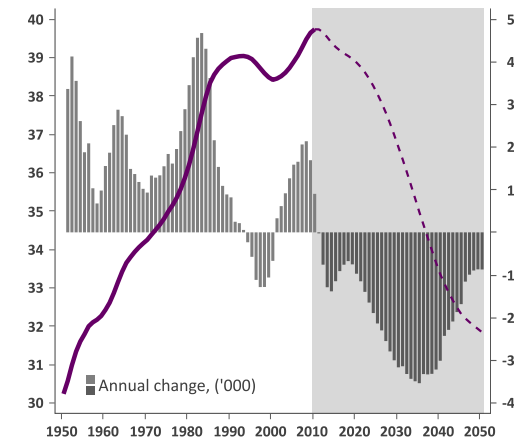
Sources: RichesFlores Research, Macrobond

## Spain



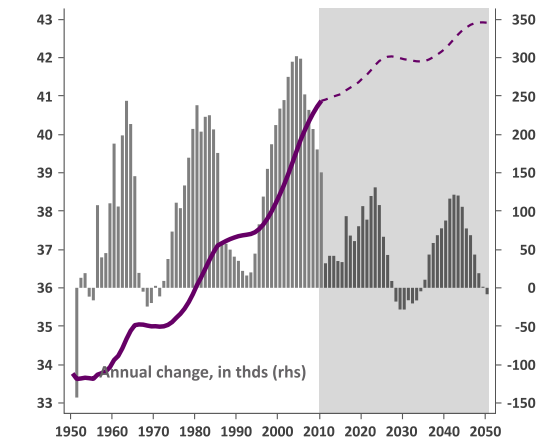
Sources: RichesFlores Research, Macrobond

## Italy



Sources: RichesFlores Research, Macrobond

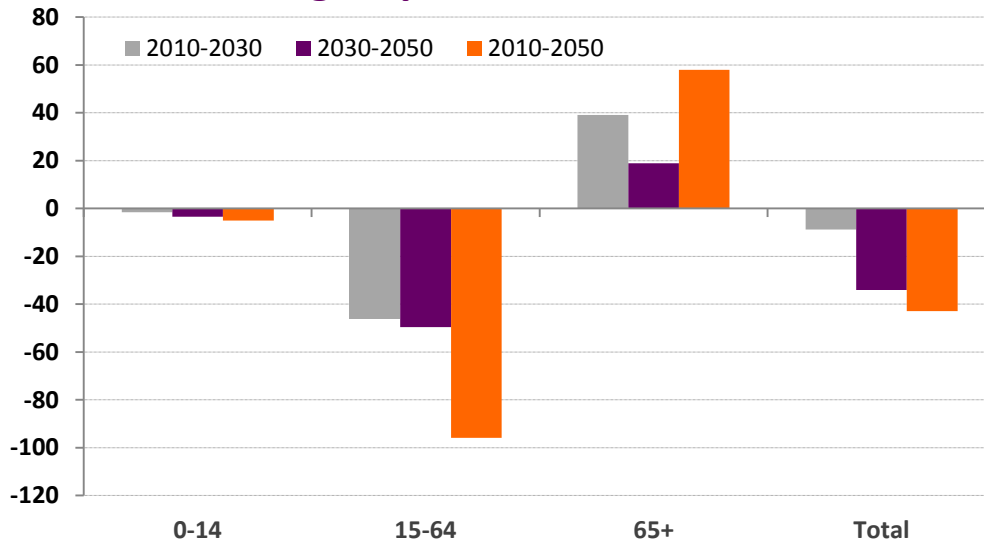
## United Kingdom



Sources: RichesFlores Research, Macrobond

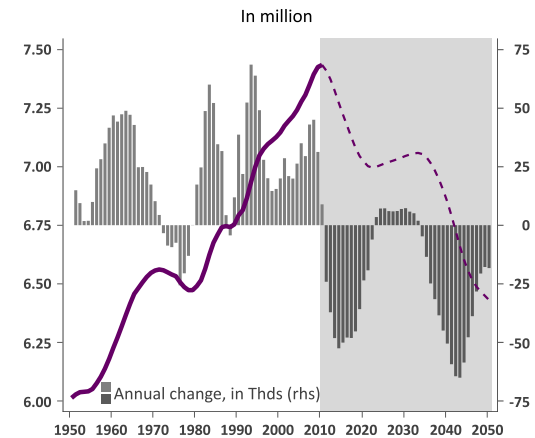
# From Western to Eastern Europe, seniors will be the only category that will be expending from now

Europe population growth by age group, 2010-2050, M



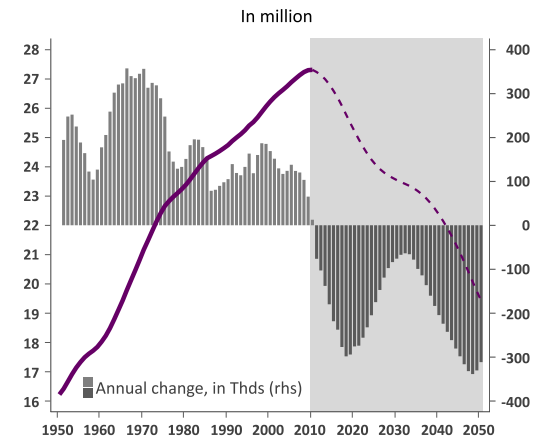
Source: UNITED NATIONS

Czech Republic Working Age Population



Sources: RichesFlores Research, Macrobond

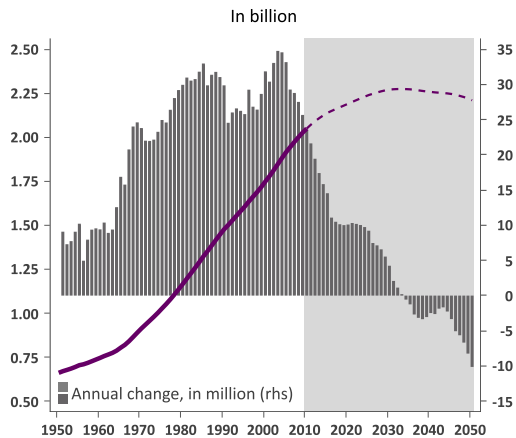
Poland Working Age Population



Sources: RichesFlores Research, Macrobond

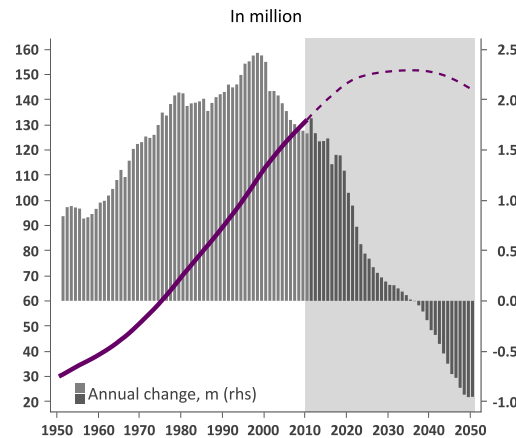
# Safer BRICS?

## Overall 5 BRICS



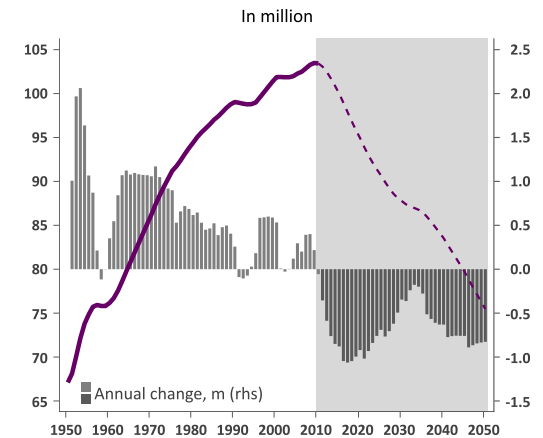
Sources: RichesFlores Research, Macrobond

## Brazil



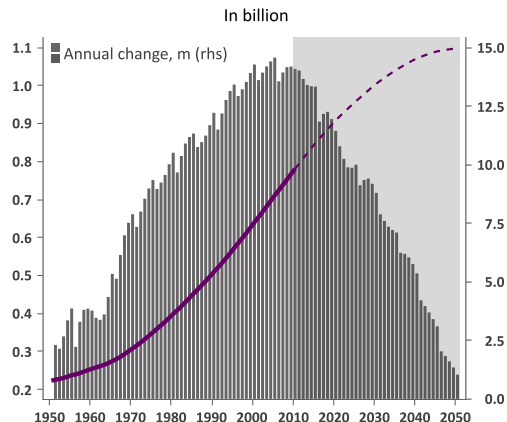
Sources: RichesFlores Research, Macrobond

## Russia



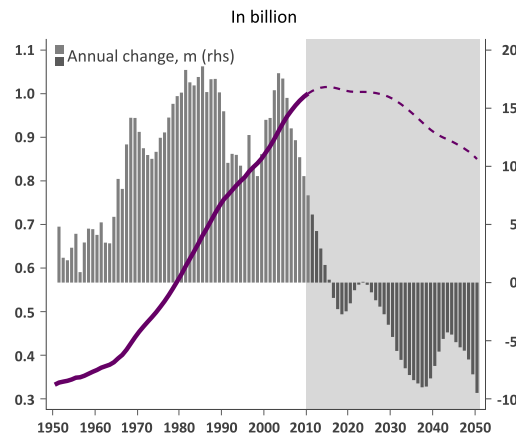
Sources: RichesFlores Research, Macrobond

## India



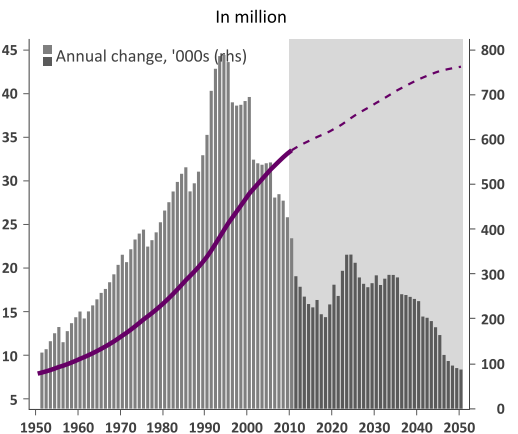
Sources: RichesFlores Research, Macrobond

## China



Sources: RichesFlores Research, Macrobond

## South Africa



Sources: RichesFlores Research, Macrobond

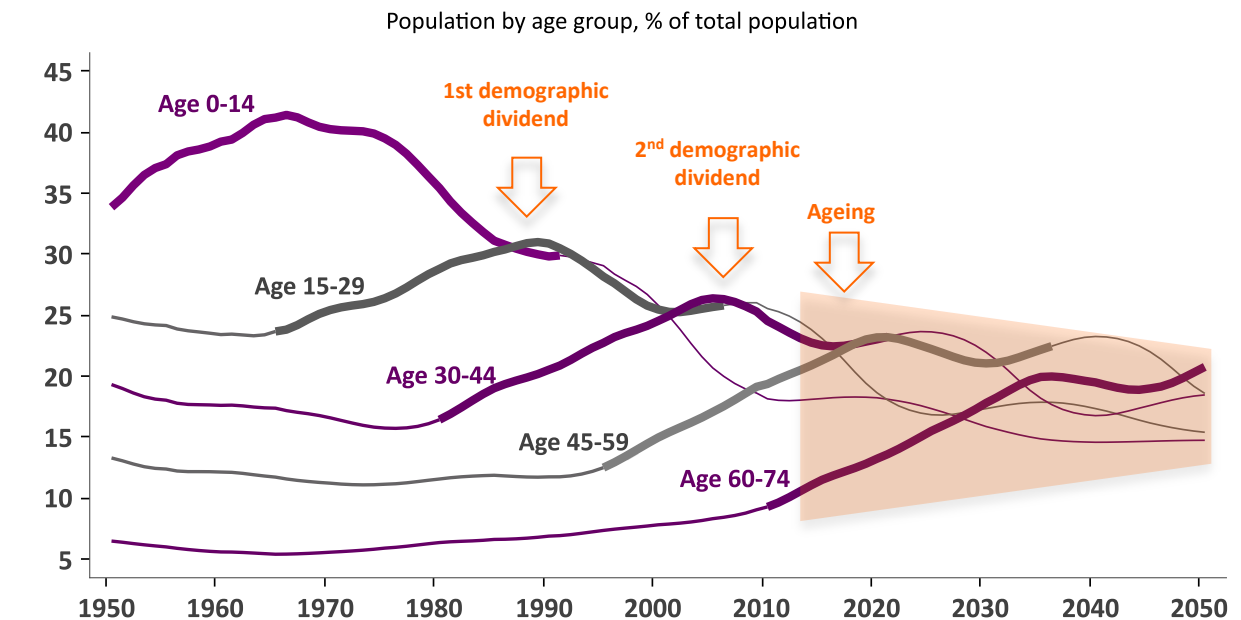


# The Chinese Dimension

The Chinese demographic boom has been a major source of demographic transition and will remain a key engine of global demographic changes in coming decades

The post-revolution baby boom followed by spectacular improvements in sanitary and health conditions shaped the Chinese demographics that supported the economic catch-up of the country over the last 30 years. The baby-boomers' cohort is now greying. An ageing process that could go faster than what is currently underway in Europe.

Changes in the Post-Revolution Baby-Boom Population (1950-1975)

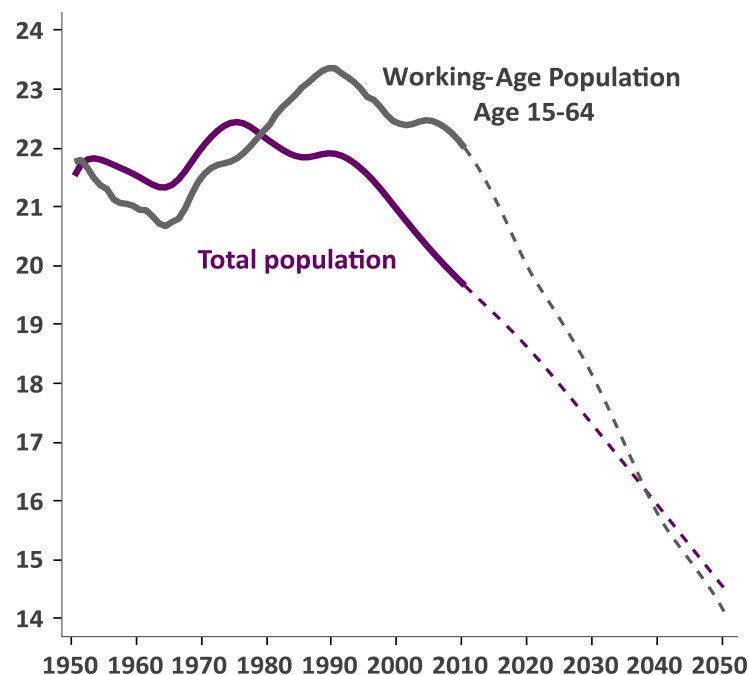


Sources: RichesFlores Research, ONU 2012, Macrobond

# China, the cornerstone of ongoing global demographic changes

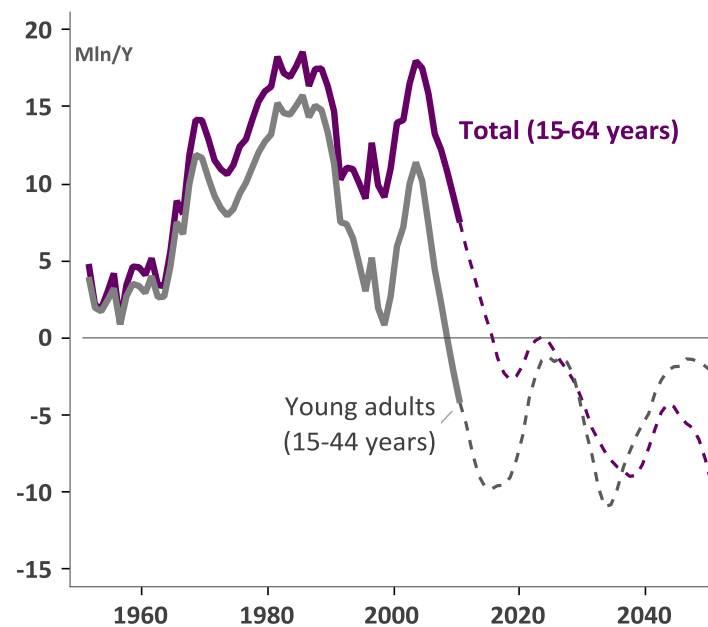
Chinese demographics have driven the world economy, accounting for over 20% of the global workforce since the 80s. The ongoing greying of China is certainly a greater issue for the world economy than the ageing phenomena in Japan and Europe.

## China's Population, % of World Population



Sources: RichesFlores Research, UN 2012, Macrobond

## Annual Growth of Chinese Working Age Population



Sources: RichesFlores Research, UN 2012, Macrobond

# Key questions arising from these observations

## FUTURE ECONOMY

### GROWTH

1.1

- What does the economic potential look like in the long run?
- How credible are current projections for global growth?

### PRODUCTIVITY

1.2

- Is a productivity boom likely as:
  - The population ages and savings resources dwindle?

### LABOUR SCARCITY

1.3

- Do these trends portend the end of the “low cost” industry?
- How much of this gap could new technology fill?

## FUTURE WEALTH

### SAVINGS

2.1

- What is the outlook for future savings/asset accumulation as baby-boomers are passing the high-saver age?
- What implication on capital cost, investment?

### REVENUE DISTRIBUTION

2.2

- What is the future of our retirement systems?
- How to prevent inter-generational conflicts?

### DEBT

2.3

- Who will repay current debt?
- Who will buy government bonds?

## FUTURE POLICY

### SUPPLY-DEMAND BALANCE

3.1

- How to balance tomorrow’s supply and demand in commodities? Innovation-efficiency-waste reduction?

### POLICY-MAKERS

3.2

- Policy implications, socioeconomic and geopolitical risks?
- Will central banks keep their independence?

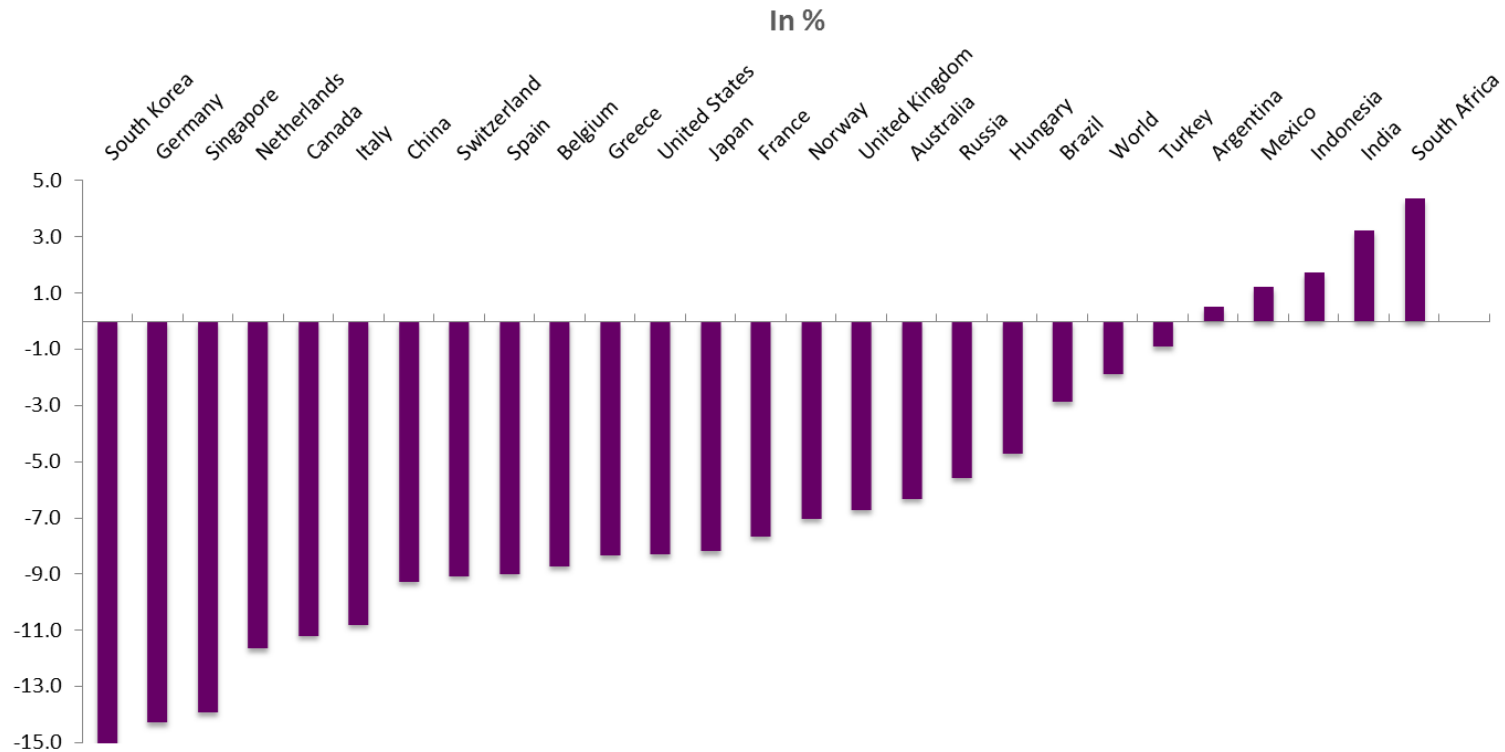
# The Future Economy of a Greying World

Shortening of the Workforce, Weakening Productivity, Erosion of Savings

# Economic Shortfall of Ageing

A smaller active/inactive ratio means less income for overall population

## Impact of Ageing on Income Per Capita, 2015-2035\*

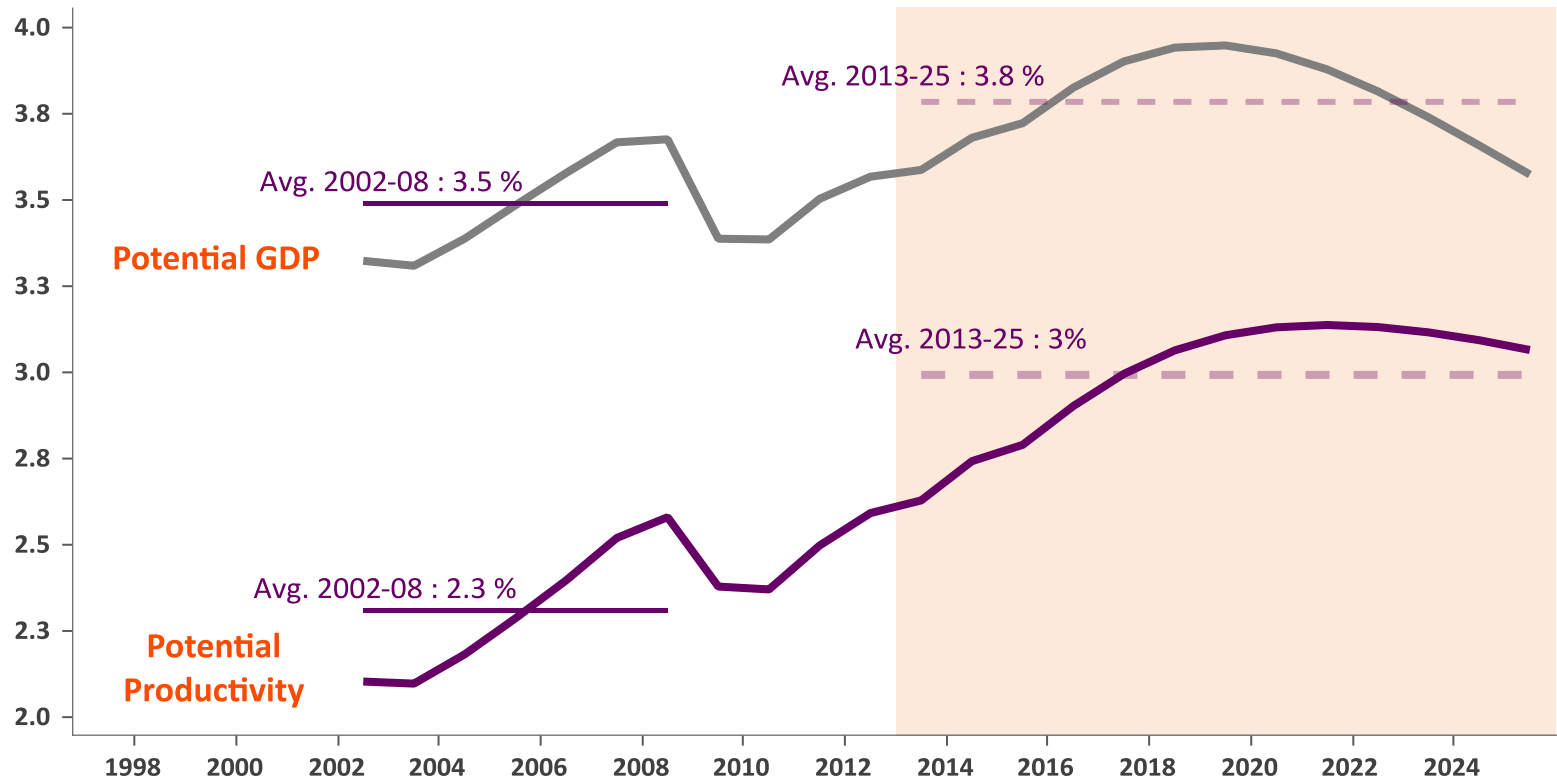


\* Everything else being equal and assuming that the working age population is the only one generating revenues, the above calculations illustrate the potential impact on revenue per capita of the shrinking share of the working age population in total population

Sources: RichesFlores Research

# Productivity Boom: Is this really the story?

## Potential GDP and Productivity Growth of The Global Economy According to OECD Long-Term Economic Scenario (2013)

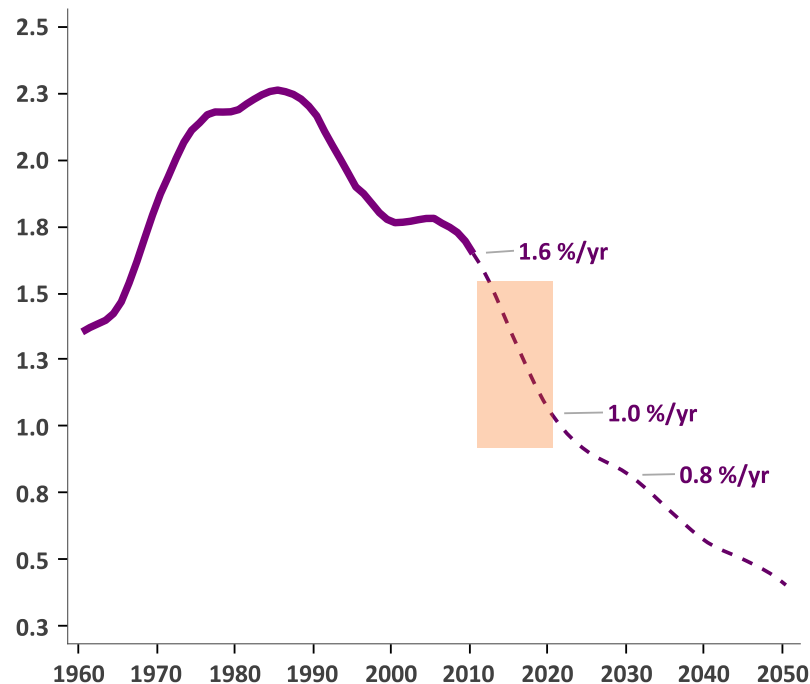


Sources: RichesFlores Research, Macrobond

# Substituting Increasingly Rare Labour with Productivity: a Dire Necessity But Not Yet a Done Deal

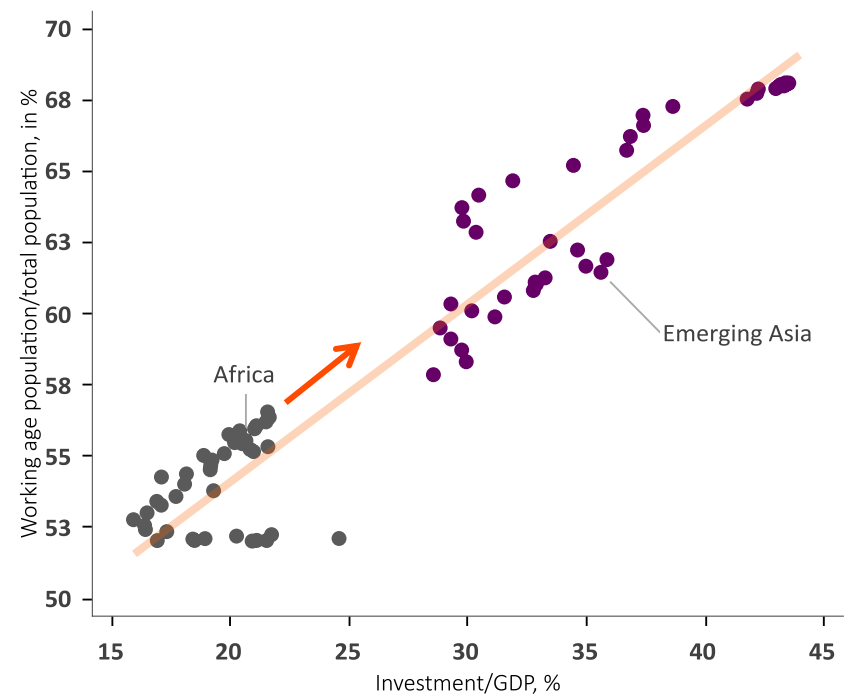
Productivity needs capex which itself looks strongly dependent on the labour factor....

Average Annual Growth Rate of Global Working Age Population, 10Y avg.



Sources: RichesFlores Research, UNO, Macrobond

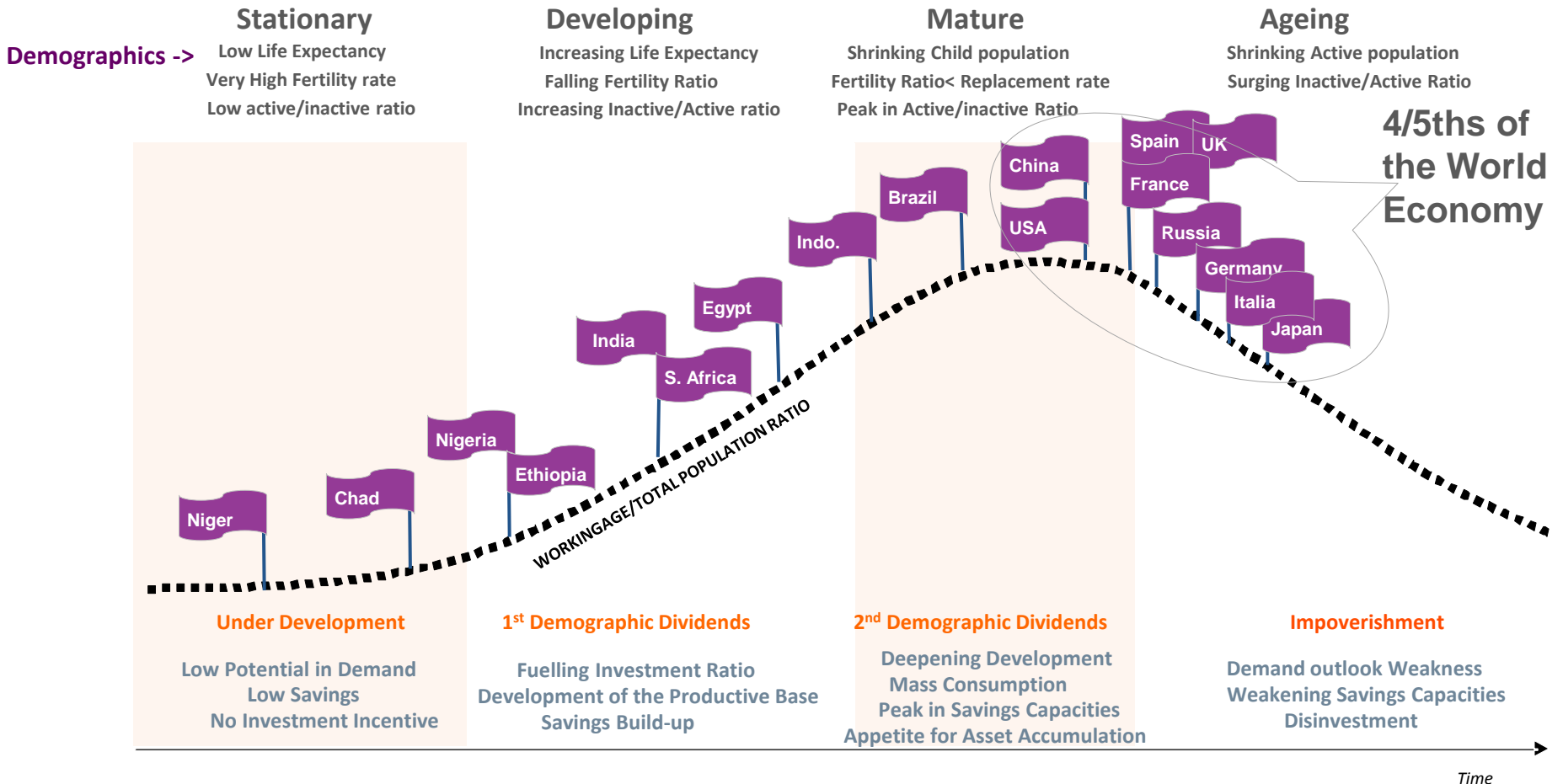
Working Age Population and Investment Rate in Developing Areas -1980-2015



Sources: RichesFlores Research, Macrobond

# Desperately Seeking Future Suppliers

## From Demographic Cycle to Economic Foundations





# Filling the gap

- **Immigration**
- **Postponing the retirement age**
- **More women in workforce**
- **Social and integration issues**
  - Immigration needs time to be absorbed
  - Can damage faster the situation in countries of origin (c.f. Eastern Europe)
- **Productivity and savings issue**
  - Productivity peaks between 35-40 yrs old
  - Earlier savings would weight on demand
- **An obvious part of the answer**
  - But headwinds are hard to remove
  - Japan is only beginning to deal with such an issue 20 years after the turning point of its demography

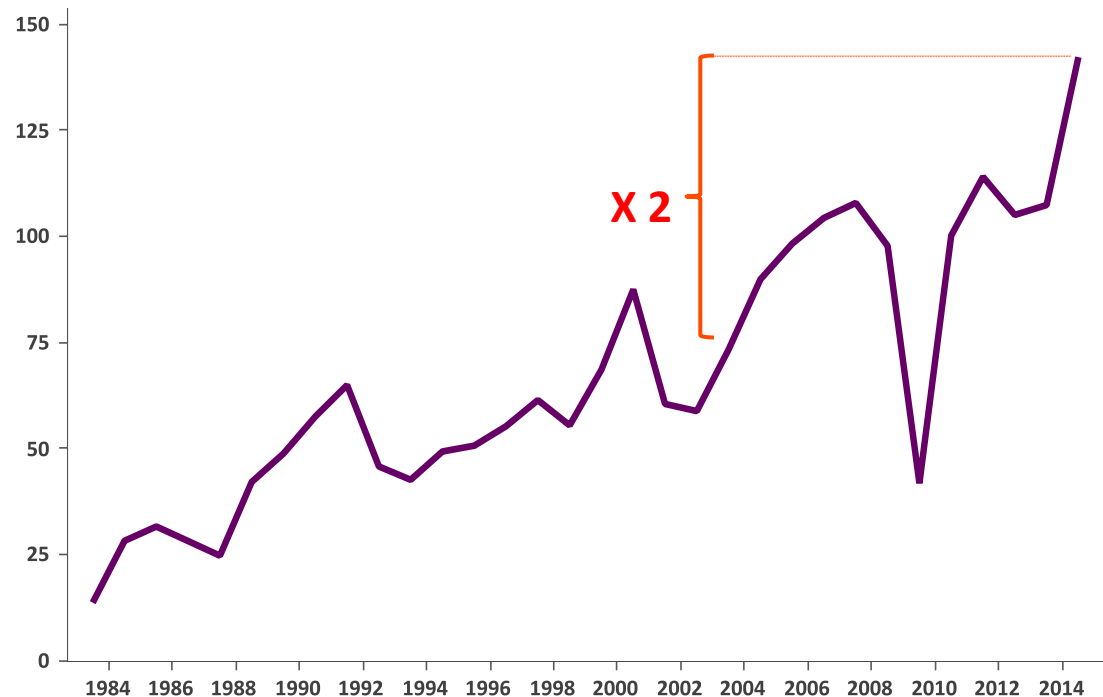
# How Much of the Labor Resource Gap to be filled by new technology?

Robots could replace workers by a large extend in industry.  
**But what will replace labour incomes? Higher taxes?**

The Boston Consulting Group predicts that cheaper and better robots will increasingly replace human workers in industry in the next decade.

Investment in industrial robots is expected to grow by 10 percent a year in the world's 25-biggest export nations through 2025 (up from 2 % to 3%/year today).  
**Human labor needs could thus shrink by 20% to more than 30% in the most active countries (South Korea for instance).**

Index of Industrial Robot Production in Japan



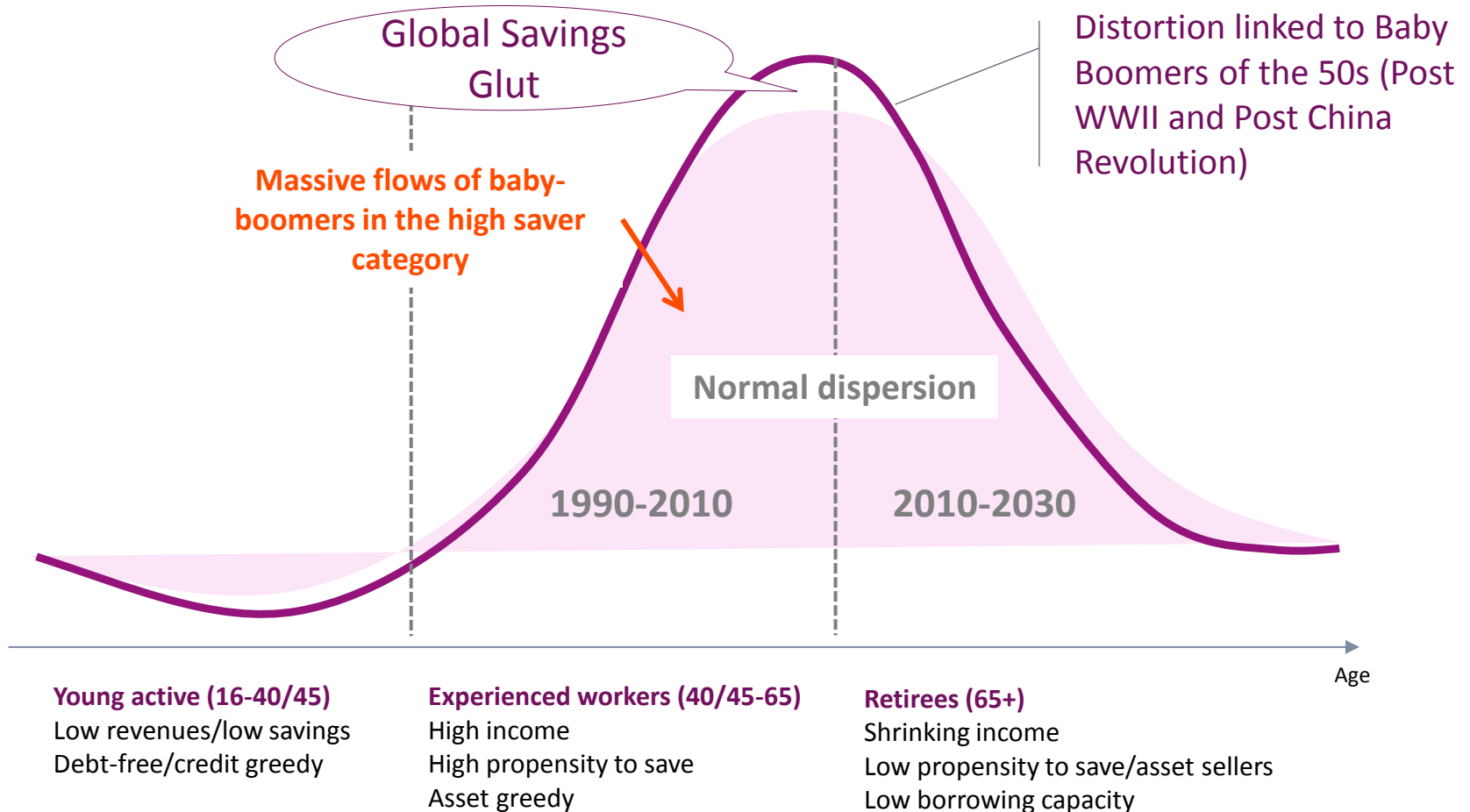
Sources : RichesFlores Research, Macrobond

# The Future Wealth of a Greying World

Savings Shortages, Capital Shortfall and Cost of Capital

# 2<sup>nd</sup> demographic dividends have been exceptional drivers for financial and housing markets

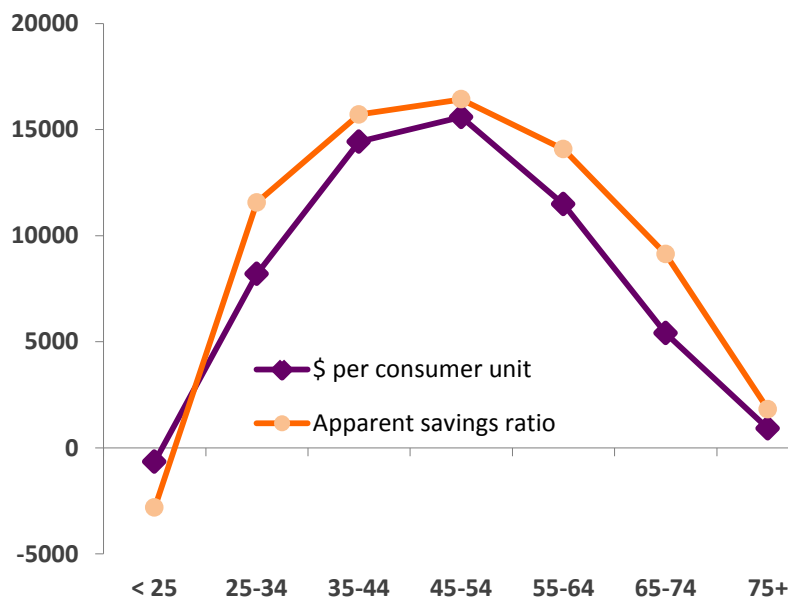
## Savings and asset accumulation over the life span



# But savings is essentially a function of age

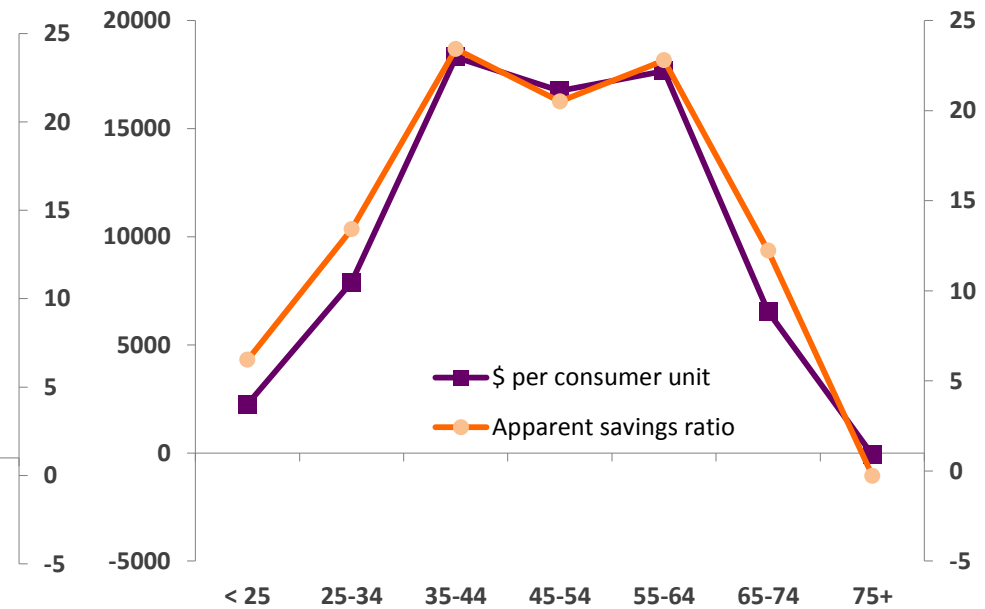
Propensity to save is closely related to age. Older population usually has low propensity to save.

US Savings by Age Group - 2005



Sources: RichesFlores Research, BLS

US Savings by Age Group - 2012



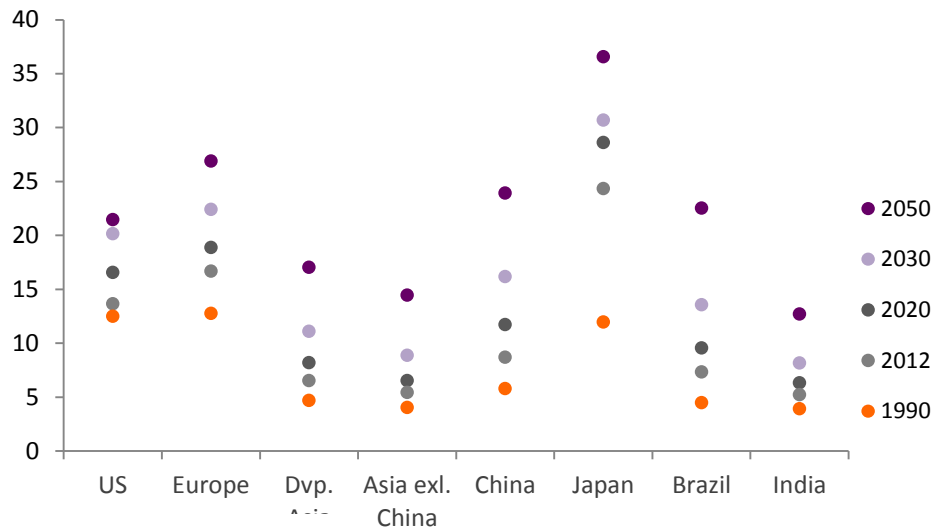
Sources: RichesFlores Research, BLS

# Retiring Baby-Boomers no Longer Feed the Cohort of High Savers

World growth of high saver population is going to slow very rapidly moving forward

Older population means lower savings accumulation, not the opposite as often assumed!

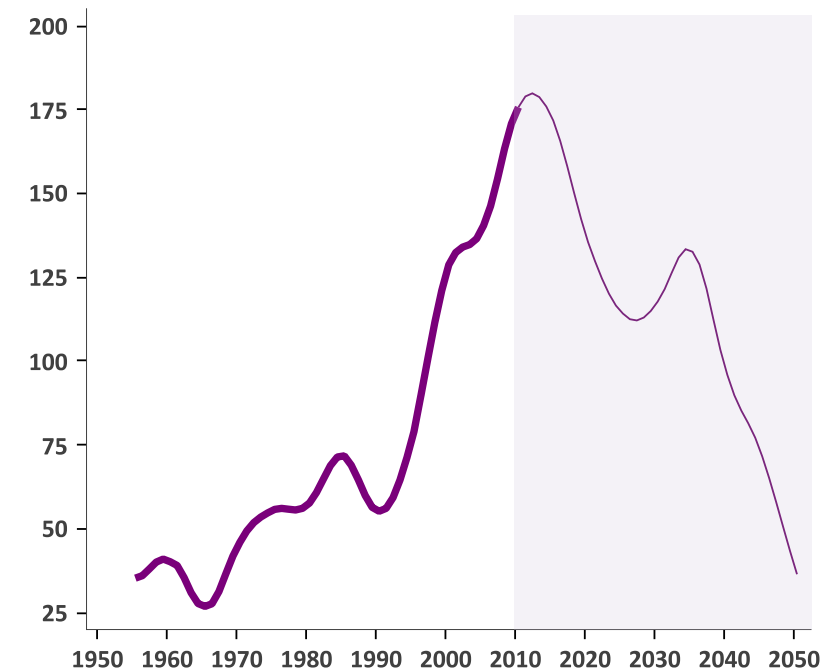
## Seniors (65+) as a % of Total Population



Sources: RichesFlores Research

## Population with High Savings Potential : 45-65 Years

5 Y growth, in millions

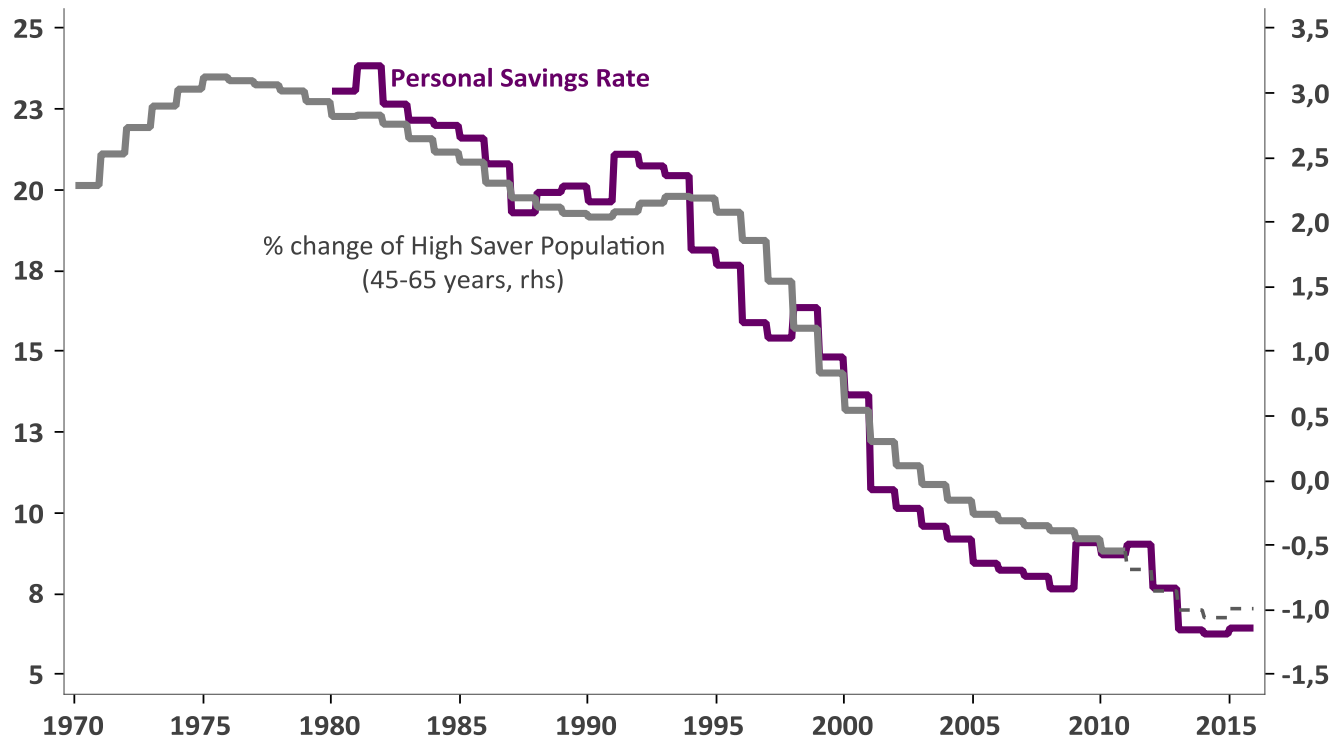


Sources: RichesFlores Research, Macrobond

# The Japanese Experience, A Concrete Validation of the Theory

The Fall in the Japanese Savings Ratio Has Been Impressively Correlated to the Shrinking Trend of the 45-65 Years Old Population over the Last 25 Years

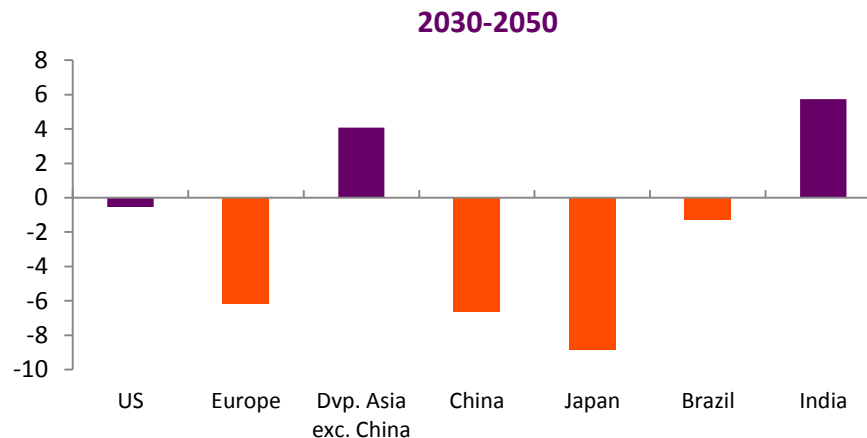
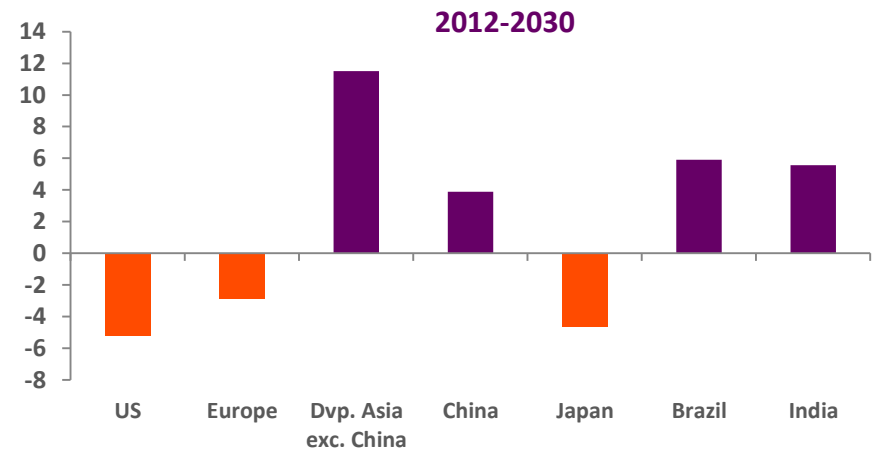
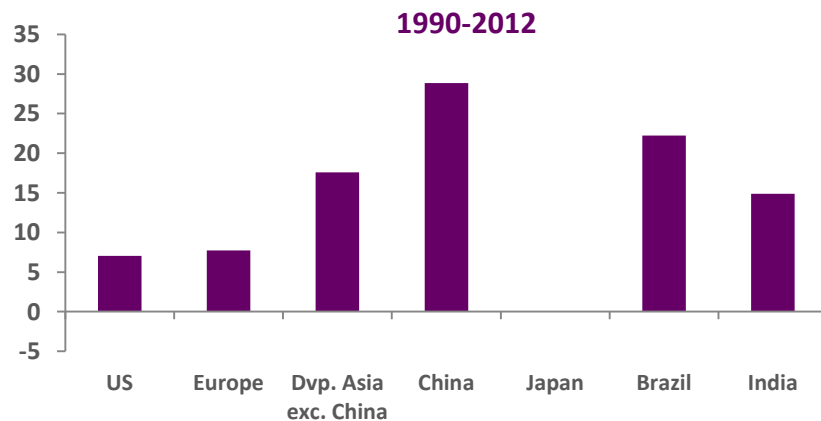
## The Japanese Experience of Ageing



Sources: RichesFlores Research, Macrobond

# Global Savings Build-up to Slow and then Shrink Across the Board

Influence of changing demographic structures on savings build-up, based on US savings behaviour over life span\*



\*Assuming that each country/region has the same pattern of savings as the US in 2012

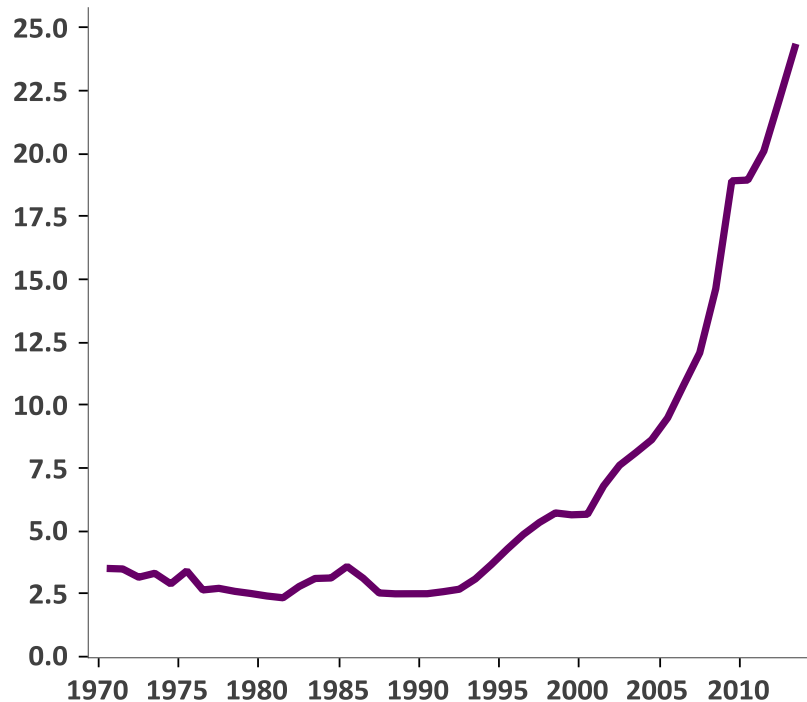
Sources: RichesFlores Research



# Again, a Major Chinese Influence

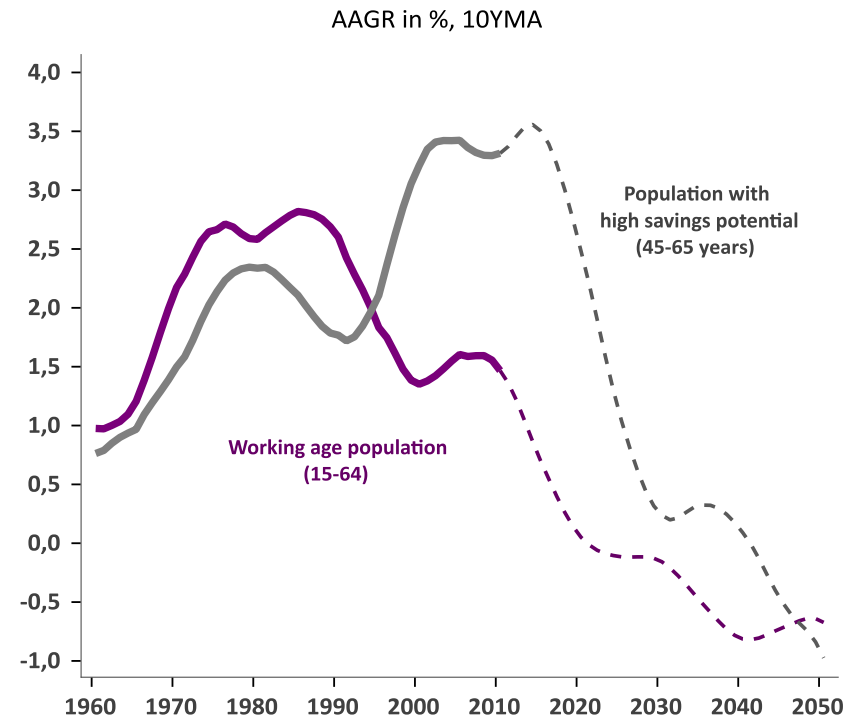
20% of Global Savings at Risk of Eroding with the Greying Of the Chinese Citizen

China's Share of Global Savings, %



Sources: RichesFlores Research, Macrobond

Chinese Population by Main Age Category

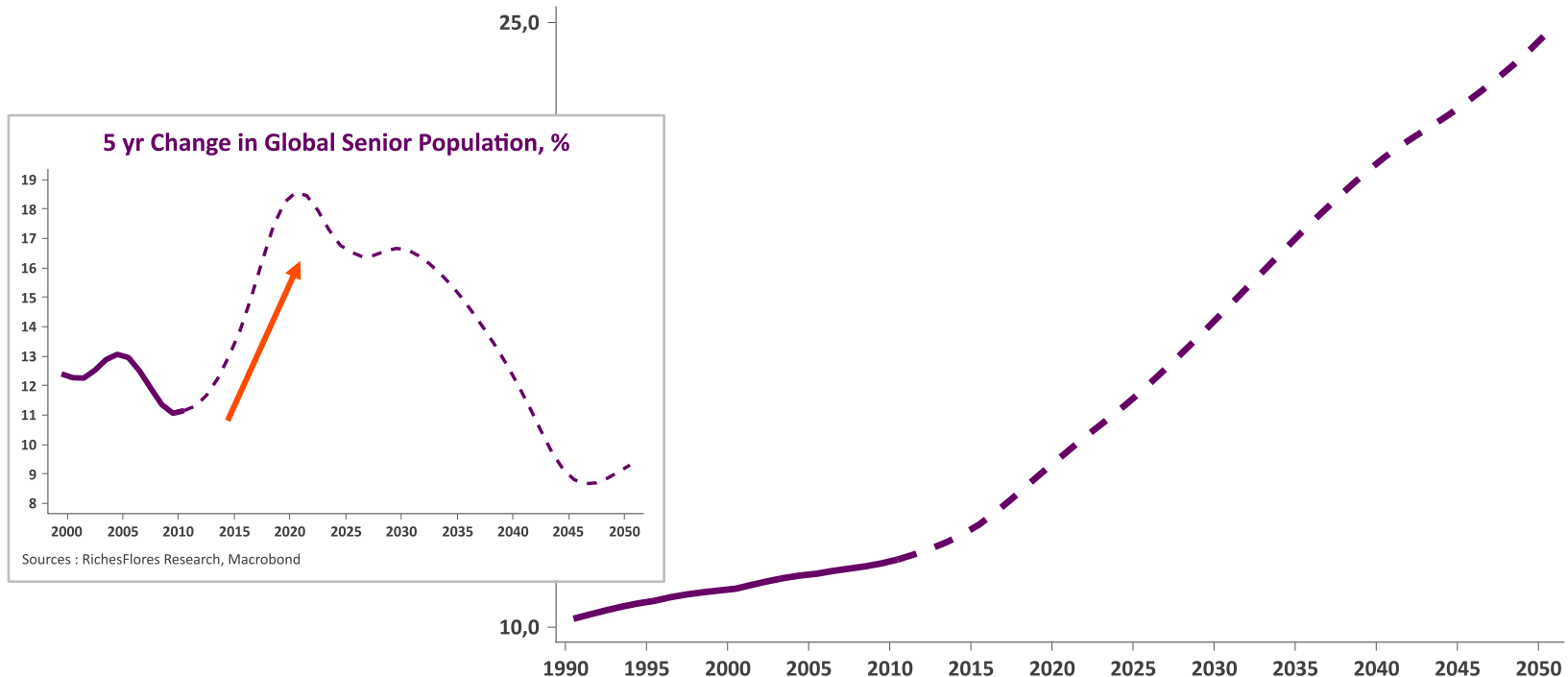


Sources: RichesFlores Research, Macrobond

# Conflicting Generations, Who Will Pay for Future Pensions?

Will Younger Generation Save More, then Spend Less than Their Parents?

World Dependency Ratio of Seniors/Working Aged Population



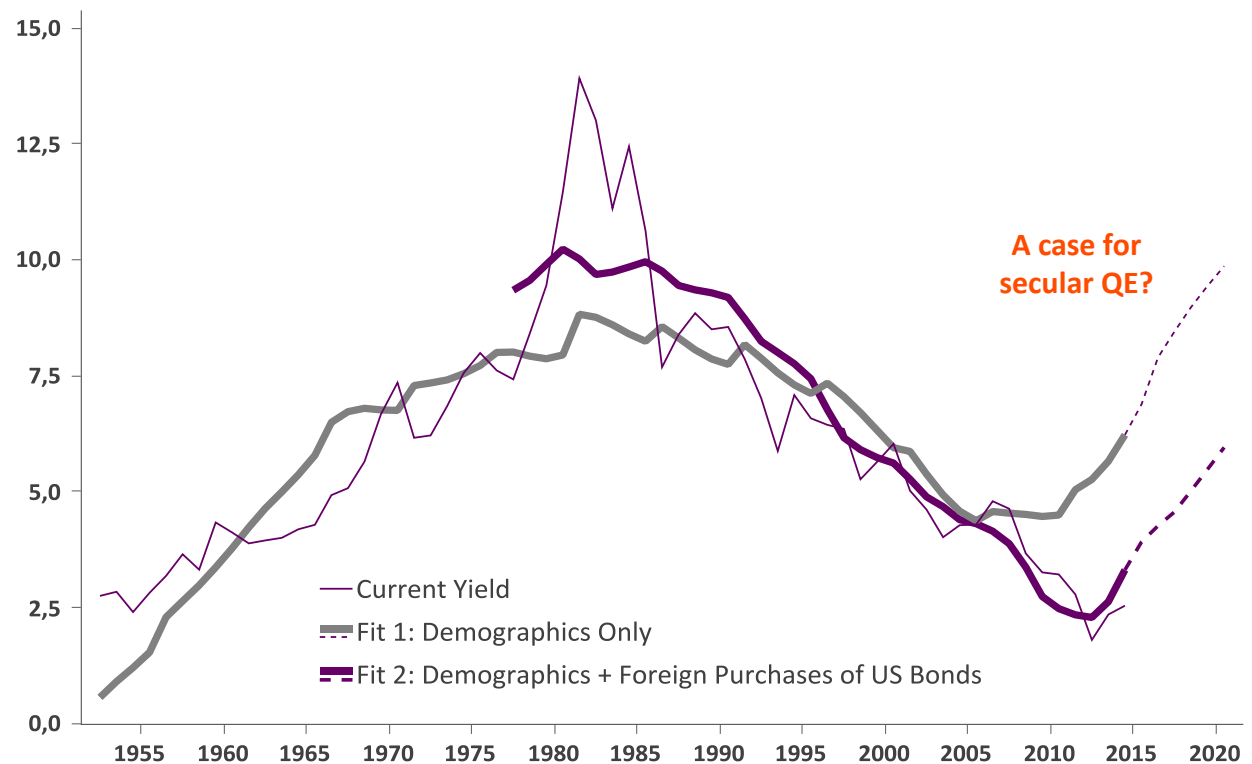
Sources: RichesFlores Research, Macrobond

# A Case for Higher Cost of Capital

Changing demographic pattern could easily push bond yields back to the levels last seen in the early 1980s over the next 10/15 years.

## US 10 Yr Bond Yields Based on Demographics

The respective trends in high/low saver population - as a proxy for excess savings - and the dependency rate - as a proxy for financial needs - would explain more than 70% of long-term interest rates over the last 50 years.

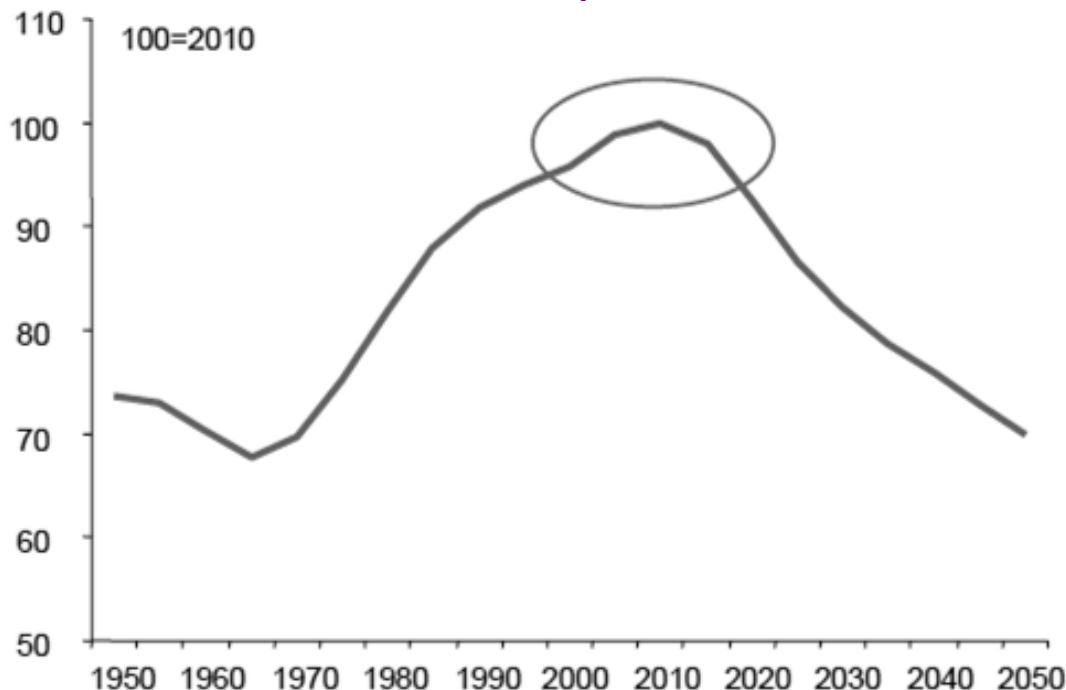


Sources: RichesFlores Research, Macrobond

# Any Buyers of Government Bonds After The Central Banks?

Seniors higher appetite for long term assets may not be sufficient to offset the negative impact on demand for bonds from lower income and the lower savings ratio of the older population

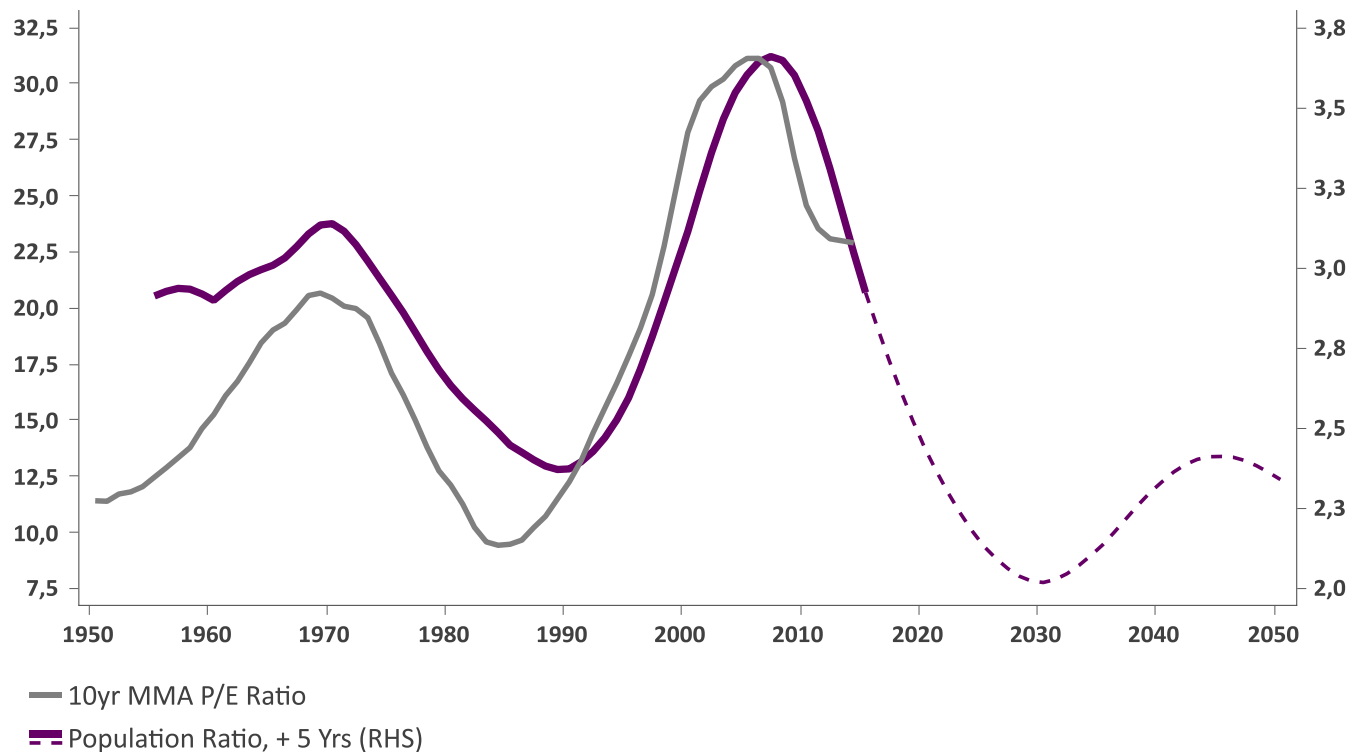
## Influence of Demographics on Demand for Bonds\* Developed Countries



\*Applying the same savings pattern by age group than in the US in 2012 and assuming the share of bonds in total savings equals the age of each population group

# A Risk-Adverse Environment

US High/Lower Savers ratio and S&P PE Ratio



Sources : RichesFlores Research, Macrobond

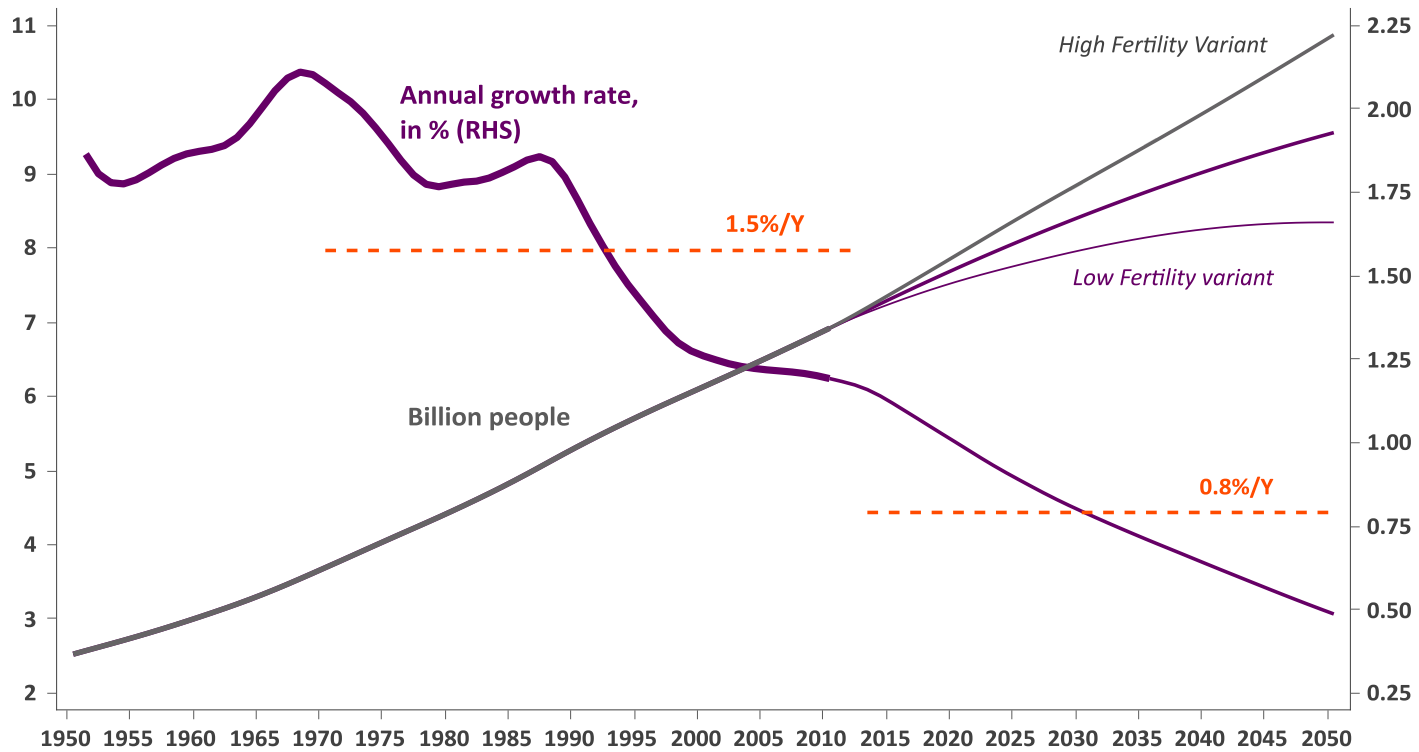
# The Future Regime of a Greying World

A Supply-Adverse Environment, Scarcity of Resources, A Highly-Regulated World

# The Existential Conundrum

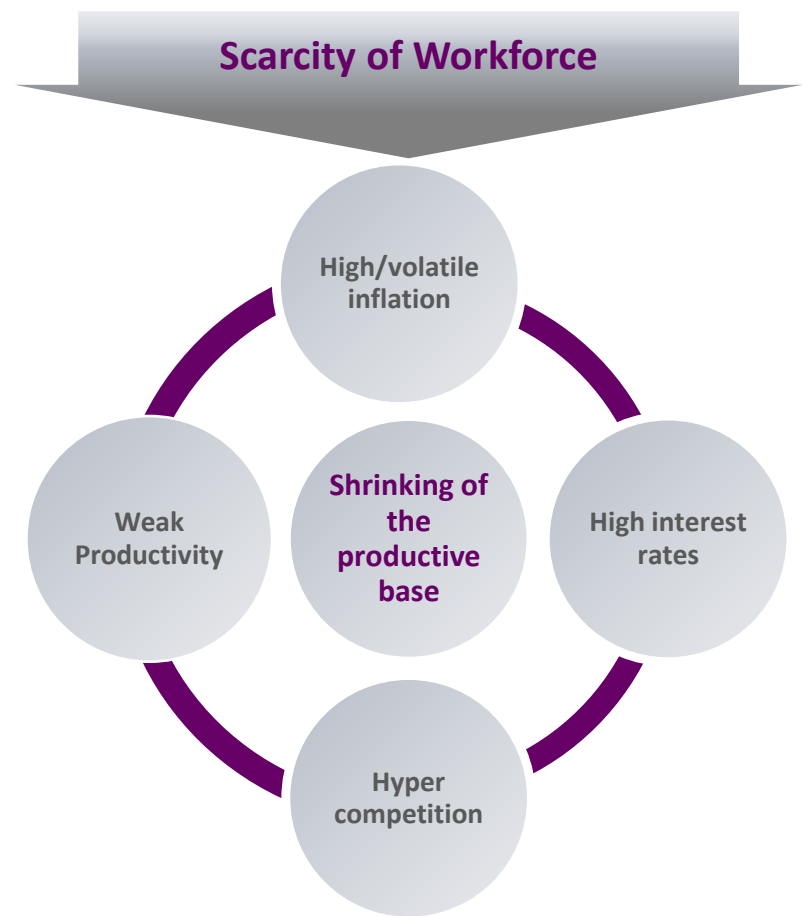
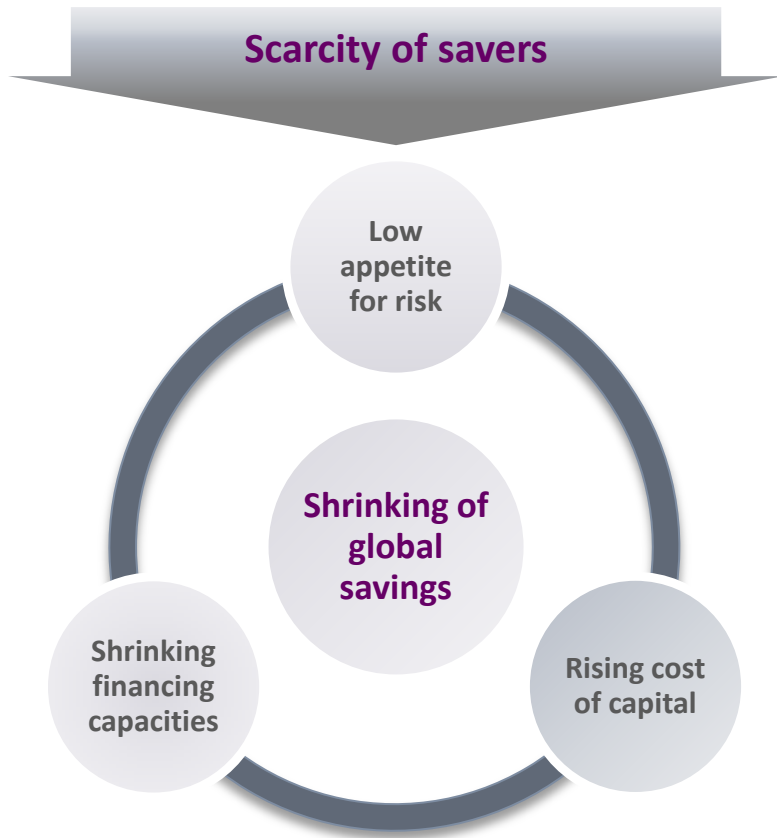
How to reconcile the need for strong population growth to support economic prosperity with the physical limits of our planet to absorb more inhabitants?

World Population and Annual Growth Rate



Sources: RichesFlores Research, Macrobond

# From Now On: A Future Without Demographic Dividends



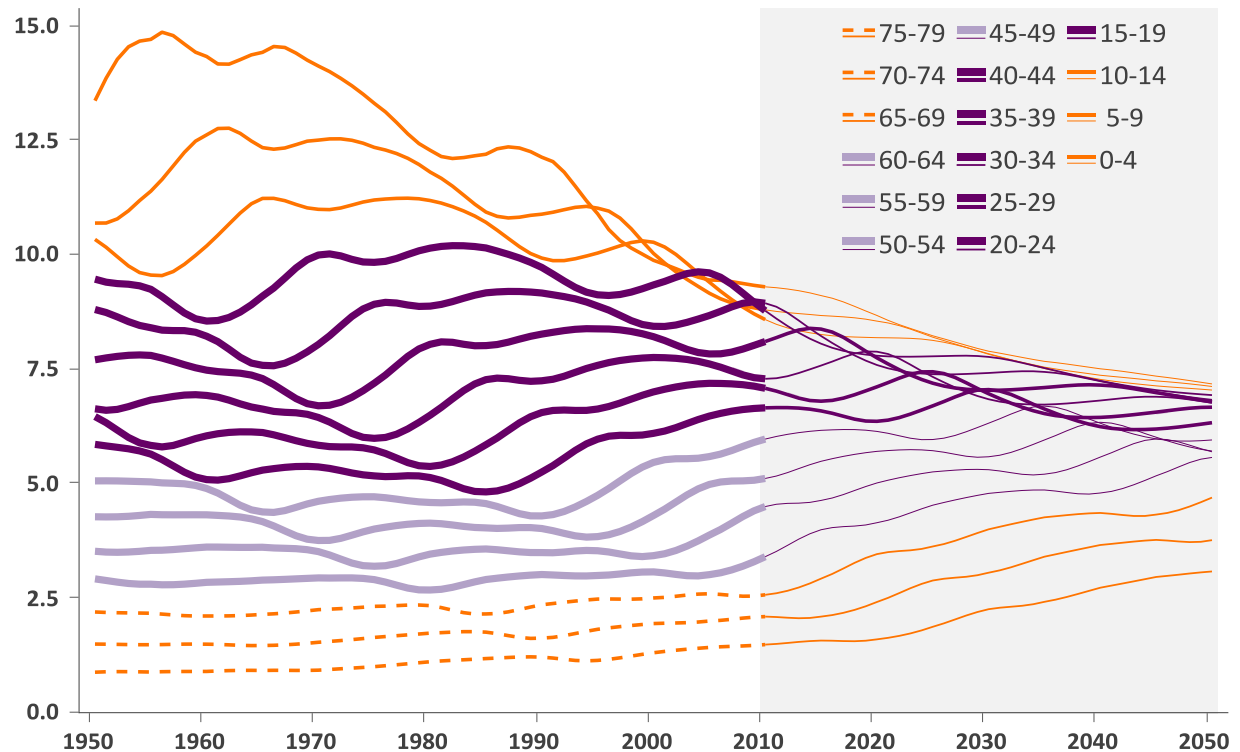


# What kind of economic regime could work for population groups of basically the same weight?

One of the main characteristics of the ageing process: the convergence of the different age groups toward the same weight (i.e. % of total population)...

How does capitalism work against such a background?

World Population by Age Group, As % of Total Population



Sources: RichesFlores Research, Macrobond

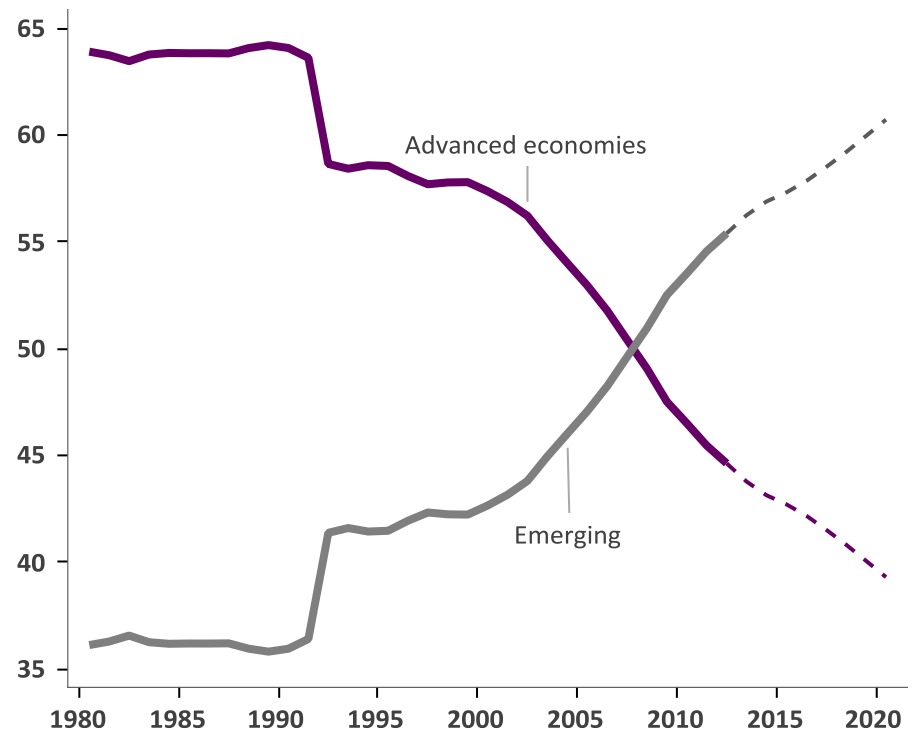
# Emerging Countries: From Global Suppliers to Demand Drivers

## Demand on the Way to Overtake Global Supply

- From now to 2030, two-thirds of the global consumption is expected to come from the emerging world, the population of which will approach 7 billions.
- An additional two billion consumers instead of one billion so far concentrated in advanced economies. Two billions of new consumers with similar needs and aspirations as today's US, European or Japanese consumers.
- After three decades during which EM countries have essentially contributed to an increasing global supply, their contribution is likely to switch on global demand.

## Share of The World GDP

In % of world GDP, at purchasing power parity

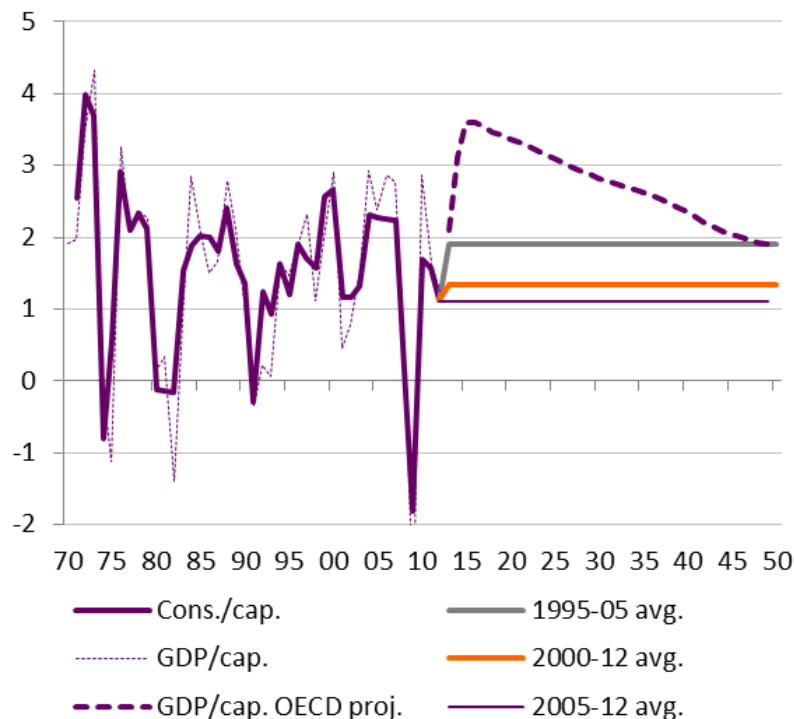


Sources: RichesFlores Research, IMF, Macrobond

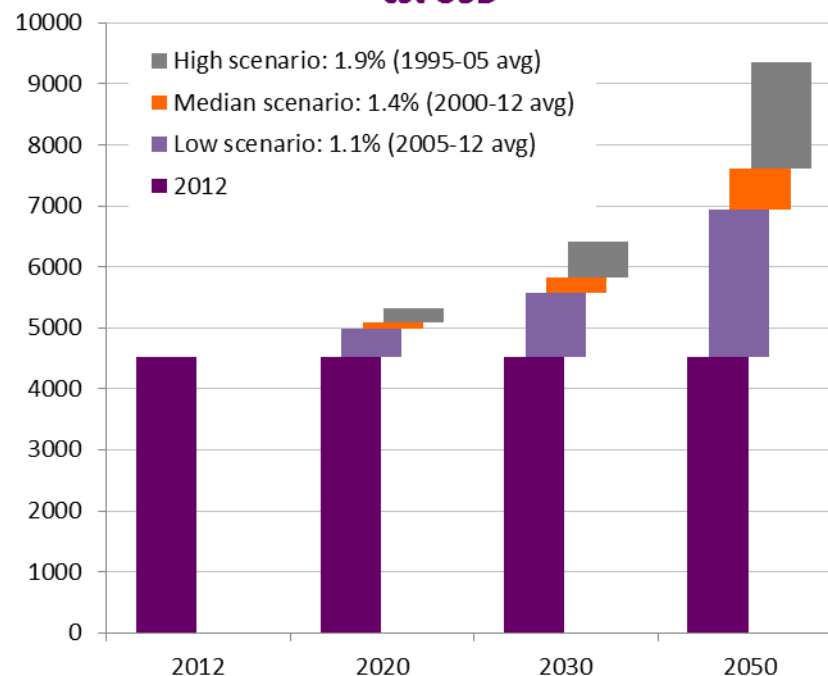
# Global Consumption Needs Will Surge Despite Ageing

**Higher income in EM countries + Population Growth = Explosion in Needs**

**Past Growth in Real Consumption per Capita and Working Assumptions**



**World consumption/capita projections, cst USD**

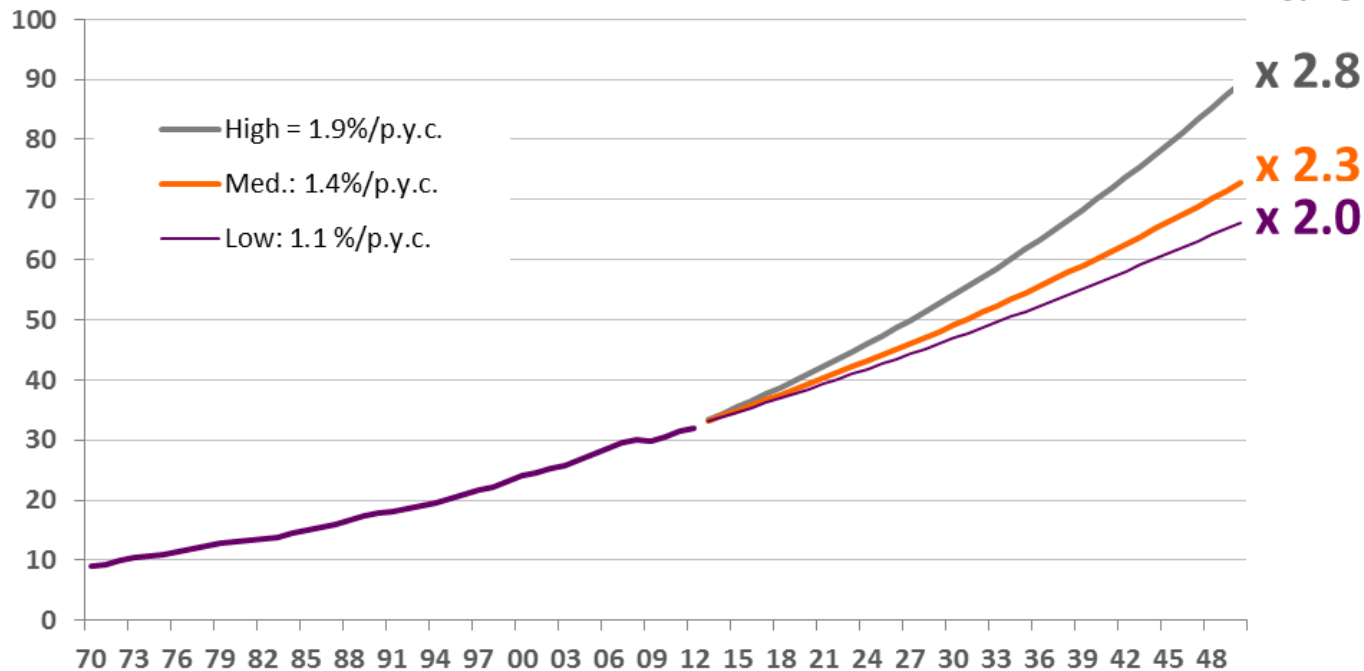


Sources: World Bank, RF Research estimates

# By 2050, World Consumption Should be 2 to 3 Times Its Current Level

World Consumption According to The Different Working Assumptions, Tr \$, csts

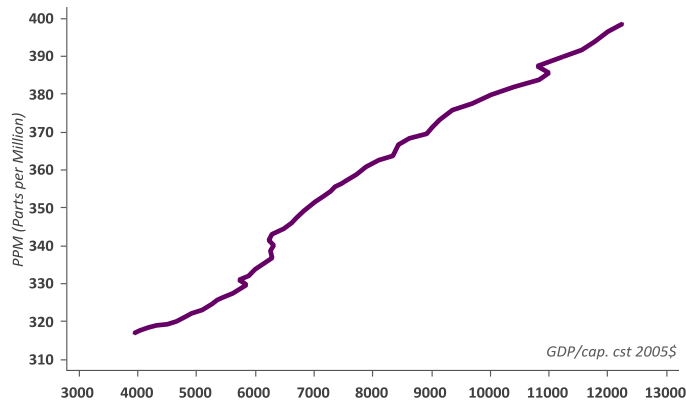
**x 3.7** with OECD's LT Scenario -i.e. 2.7% p.a. in real GDP/cap- the right one



Sources: World Bank Data, RF Research estimates

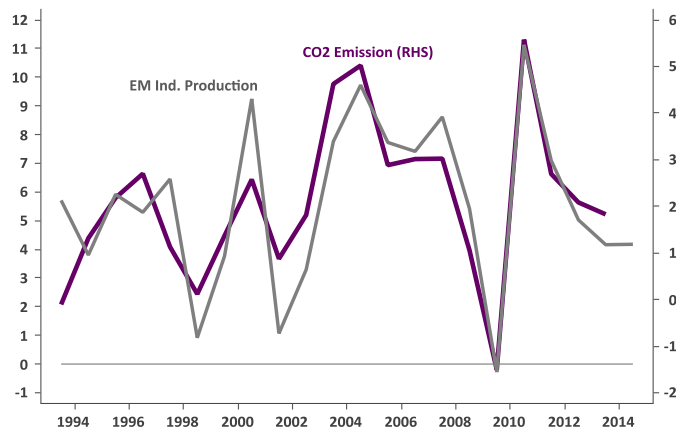
# Global Warming, A Powerful Driver for an unescapable Multi-Criteria Innovation Trend

Carbon Dioxide Concentration in the Atmosphere and GDP/cap.- 1960-2012



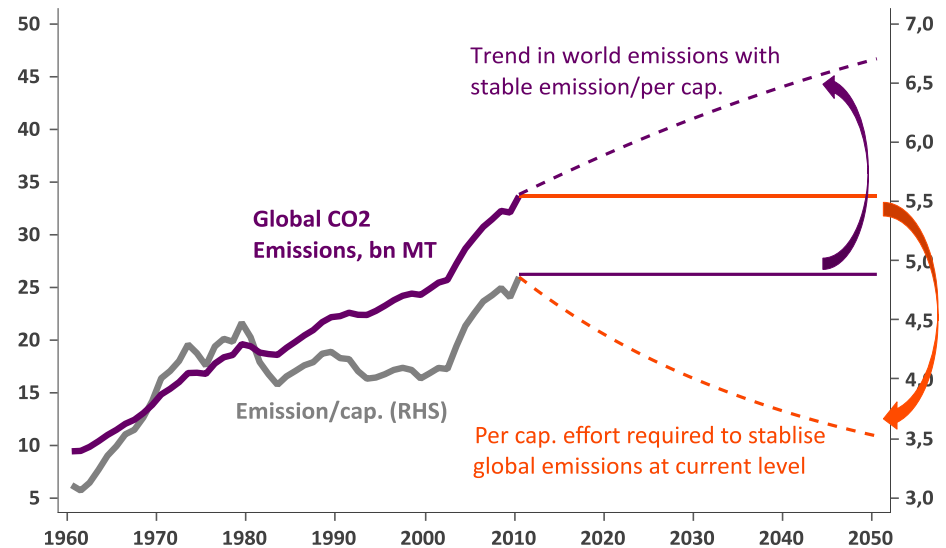
Sources : RichesFlores Research, Macrobond

Global Carbon Dioxide Emission and EM Industrial, %



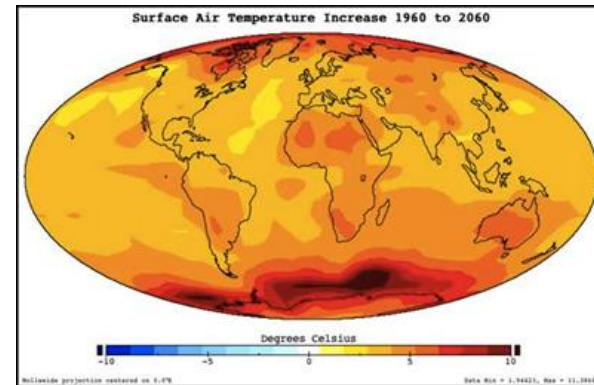
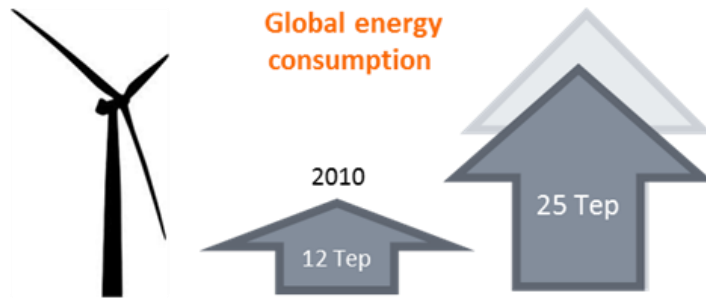
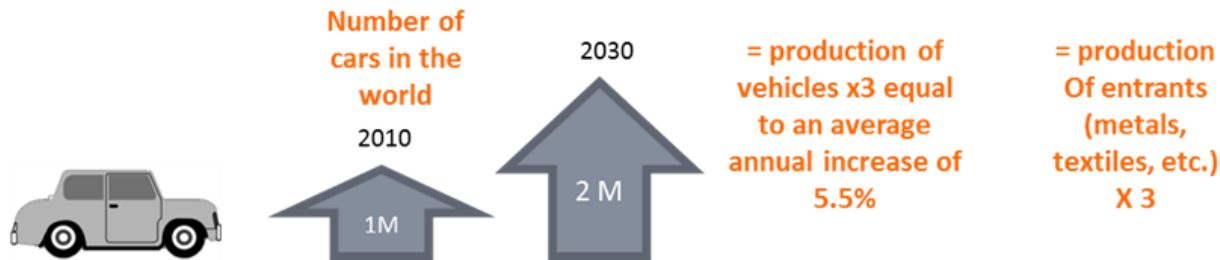
Sources: RichesFlores Research, Macrobond

Impact of Future Rise in Population on Carbon Emissions and Effort Required to Stabilize CO2 Emissions



Sources : RichesFlores Research, Macrobond

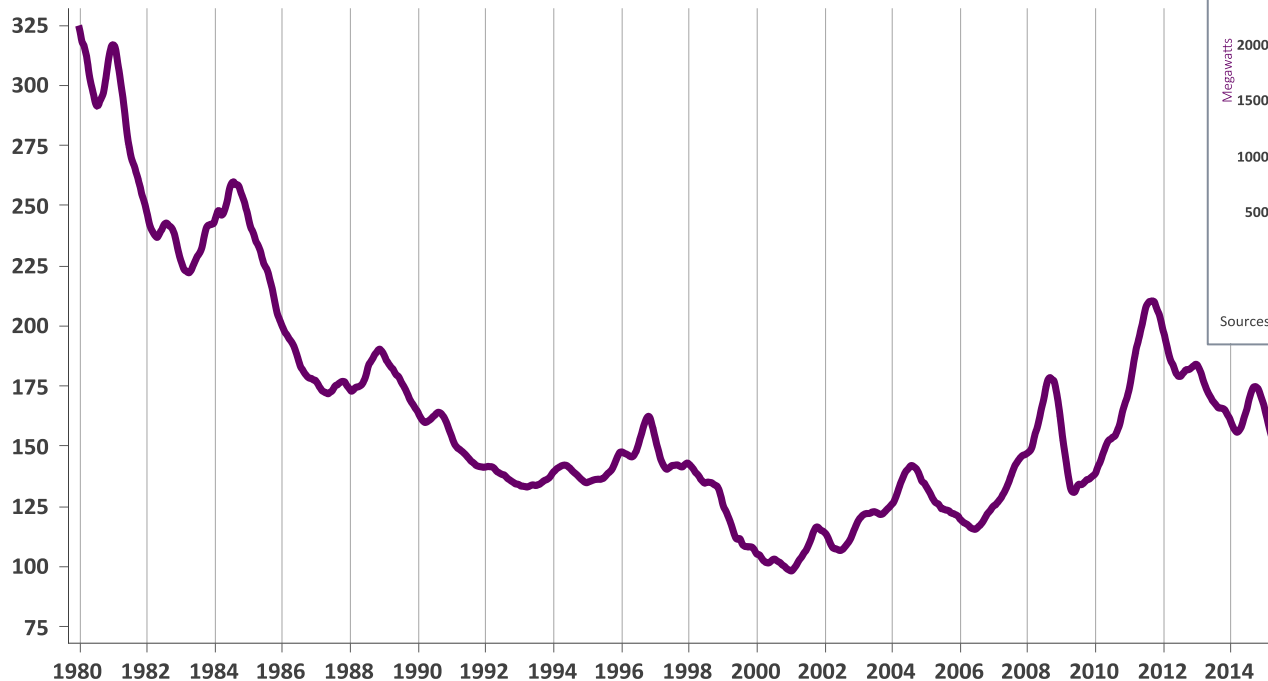
# Innovation: An Imperative for Surpassing the Physical Limits of The Planet's Development



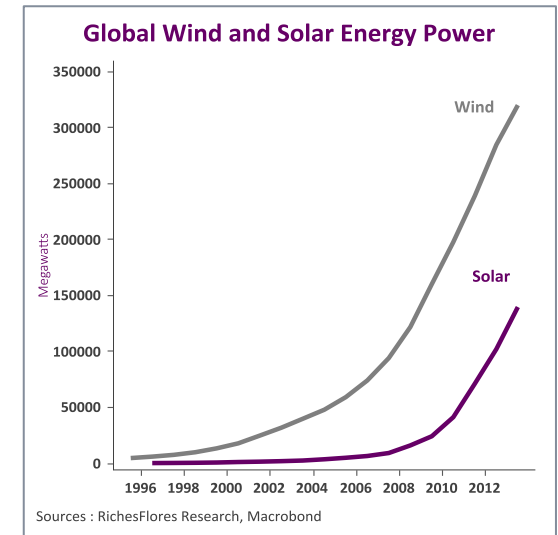
# Will Innovation Prevent Structural Rise in Commodity Prices To Go Ahead?

## Real Prices of Commodities, CRB Index at 2014 USD Prices

J. 2000=100



Sources : RichesFlores Research, Macrobond

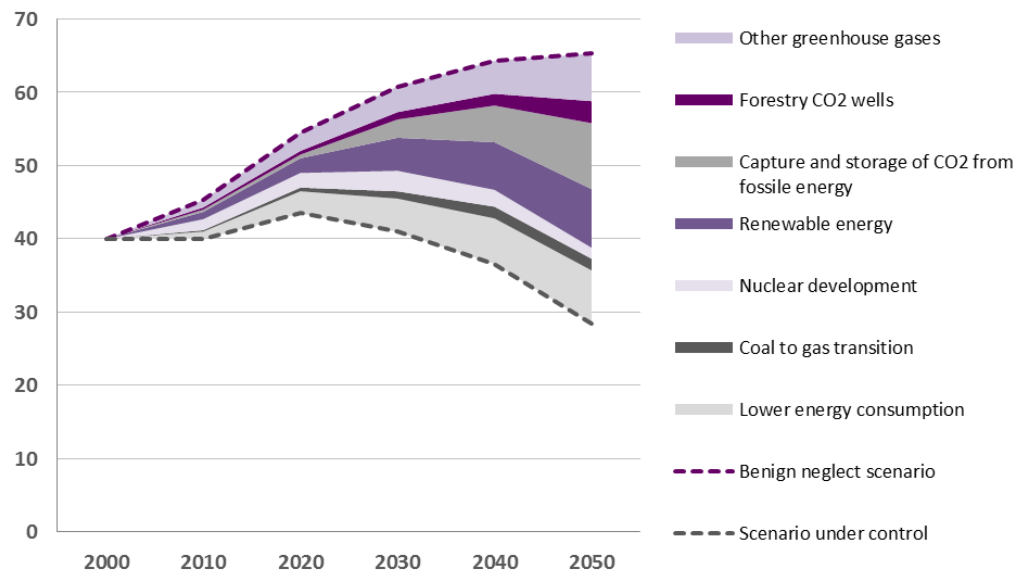


Sources : RichesFlores Research, Macrobond

# Innovation, Energy is Only One of the Area Where Things Should Change

## The Transition in Energy

### Greenhouse Gas Emissions With and Without action - 2000 and 2050



Source: World Bank, 2009

## Other Transitions Coming Soon

- ➡ **Transports**
- ➡ **Agriculture**
- ➡ **Industry**
- ➡ **Communication**
- ➡ **Urbanization**
- ➡ **Nutrition**



# Tomorrow Major's Projects

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## • Primary Needs

- Food
- Habitat
- Energy
- Transport-communication

## • Innovation

- Technology
- Agronomy
- Health- Medicine
- Beyond Earth

## • Resource Protection

- Water
- Earth
- Seas
- Air

## • Resource Allocation

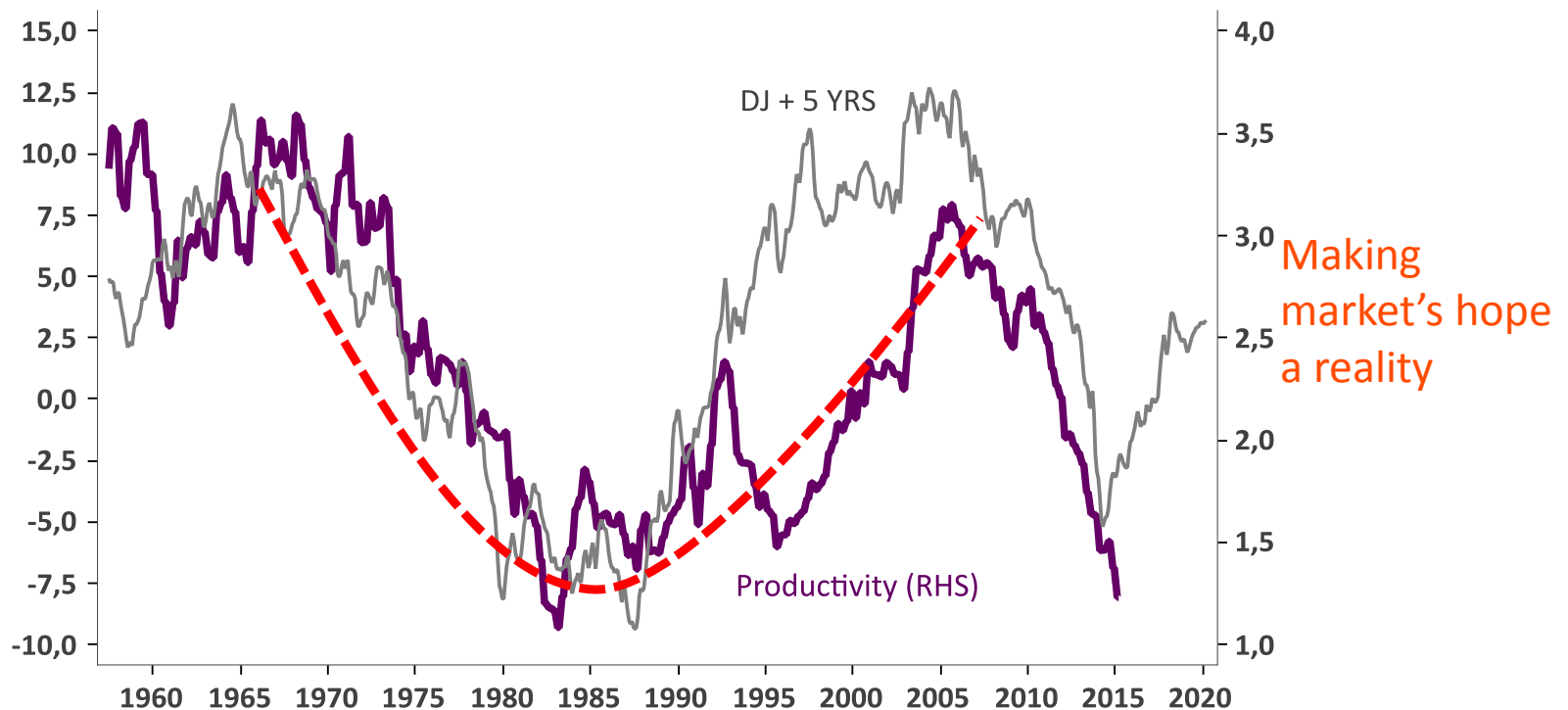
- Education, Work Force, Migrations
- Financial Resources: Savings, Pensions, repartition
- Regulation
- World Governance

# Innovation to Feed Tomorrow's Population and Productivity

## Secular Trends in Labor Productivity and Equity Market

### Real Performance of the Dow Jones vs Hourly Productivity

% Annual Rate of Change over Decades



Making  
market's hope  
a reality

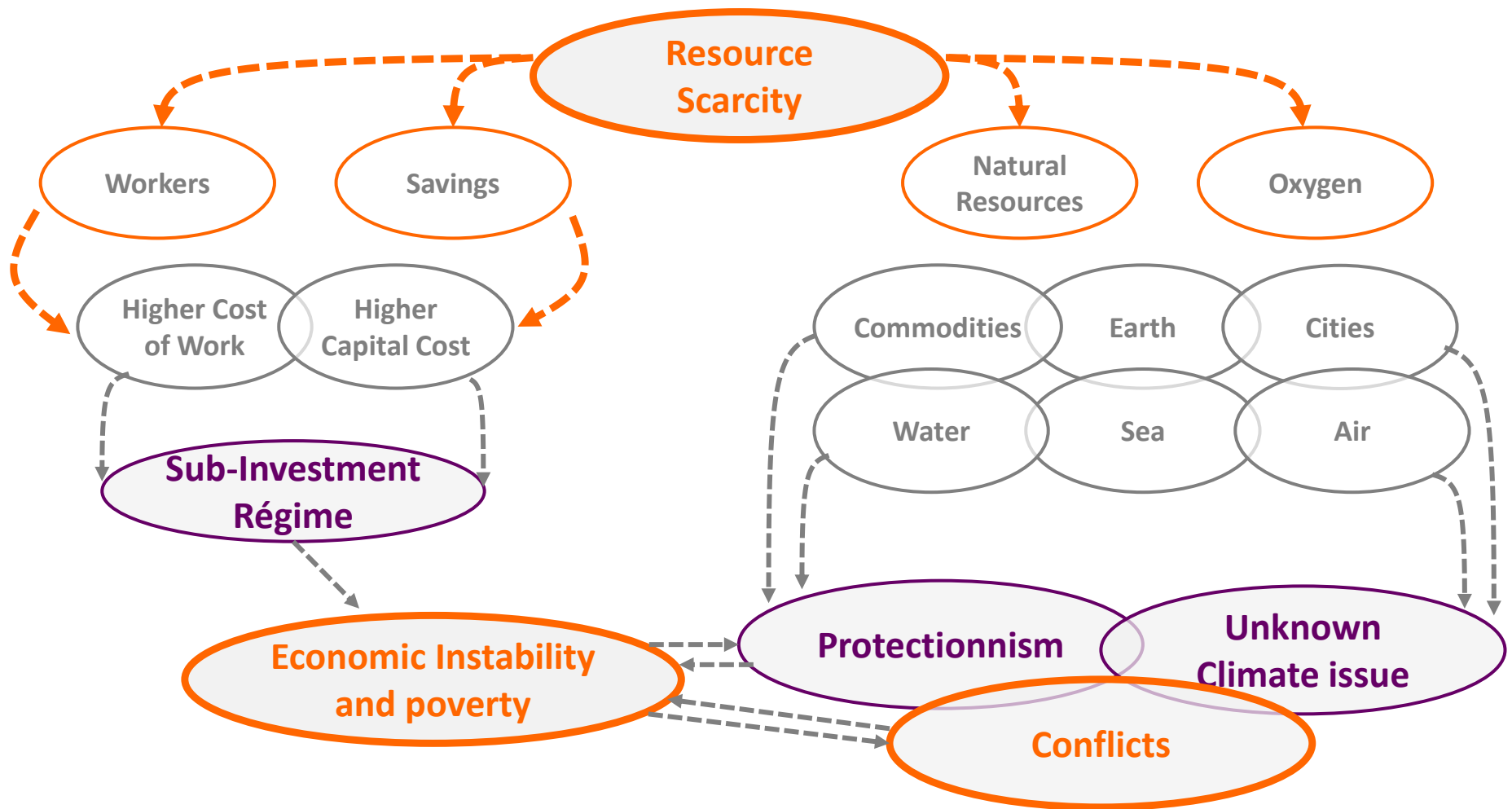
Sources : RichesFlores Research, Macrobond

# How Much to Come From IndAfrica?

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- India and most African countries have entered the most powerful stage of their demographic transition
- Fast growing population is an Investment Friendly background
- Africa has valuable natural resources
  - Energy
  - Minerals
  - Agriculture
- Both India and Africa have fast growing middle class

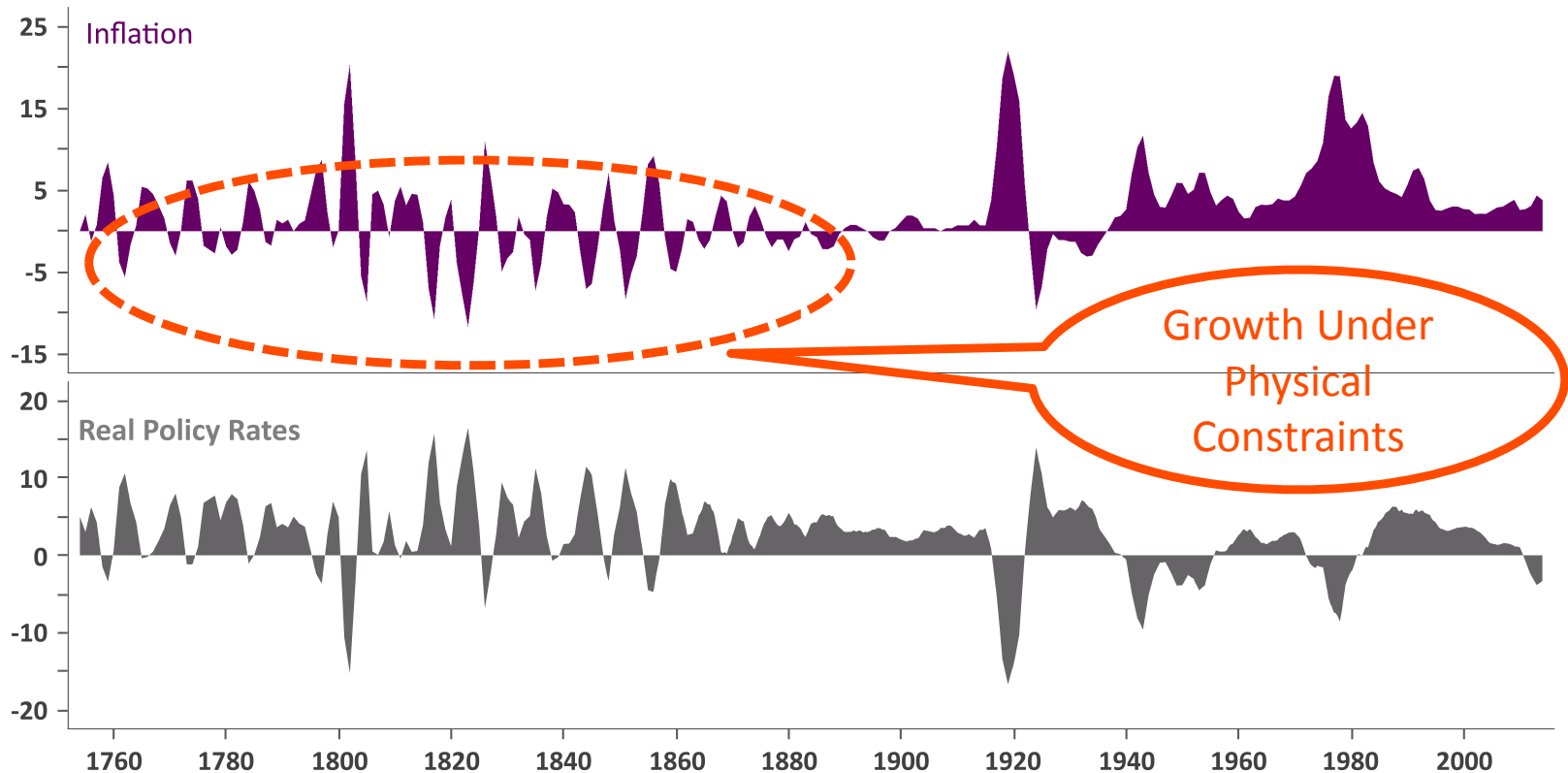
# Inaction, the Risks



# Going Faster than History

## Lessons from the Past: The British Experience

Secular Inflation and Real Interest Rates, Smoothed over 3 yrs, %



Sources: RichesFlores Research, Macrobond



**GLOBAL MACRO & THEMATIC  
INDEPENDENT RESEARCH**



RichesFlores Research is an Independent economic and financial research provider for asset management.

As an R&D entity certified by the Ministry of Higher Education and Research, RichesFlores Research is eligible for the research tax credit (Crédit d'Impôt Recherche) for the years 2013, 2014 and 2015.

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