

Why Global Demographics Matter? A Macroeconomic & Asset Pricing View

EPF International Seminar 2014
Malaysia (8th September 2014)

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ANALYST CERTIFICATIONS AND IMPORTANT DISCLOSURES ARE IN THE DISCLOSURE APPENDIX. FOR OTHER IMPORTANT DISCLOSURES, PLEASE REFER TO <https://researchdisclosure.credit-suisse.com>.

Misconceptions about Demographics

Peter Drucker (1999): “**Demographics is the single most important factor that nobody pays attention to, and when they do pay attention, they miss the point.**”

Popular misconceptions:

- Demographics is Long-term
- Age-related
- Predictable

We believe demographics is about “**People as Consumers & Workers**”.

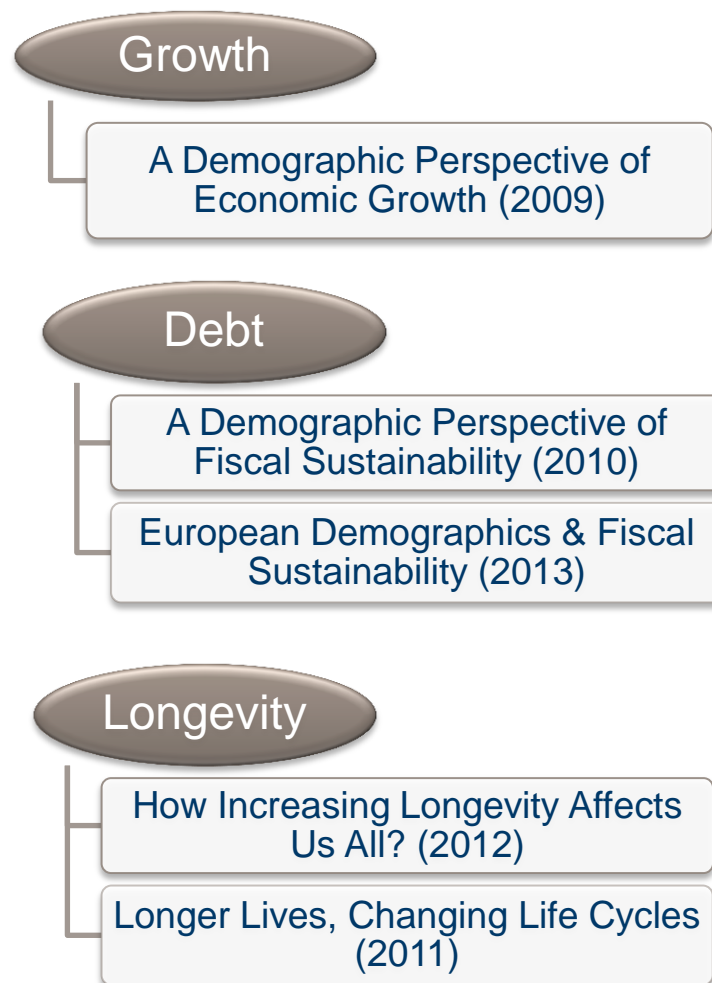
Affects income statements & balance sheets of households, corporates & countries.

Source: Management Challenges for the 21st Century (Harper Business, 1999)

Demographics and What it Impacts

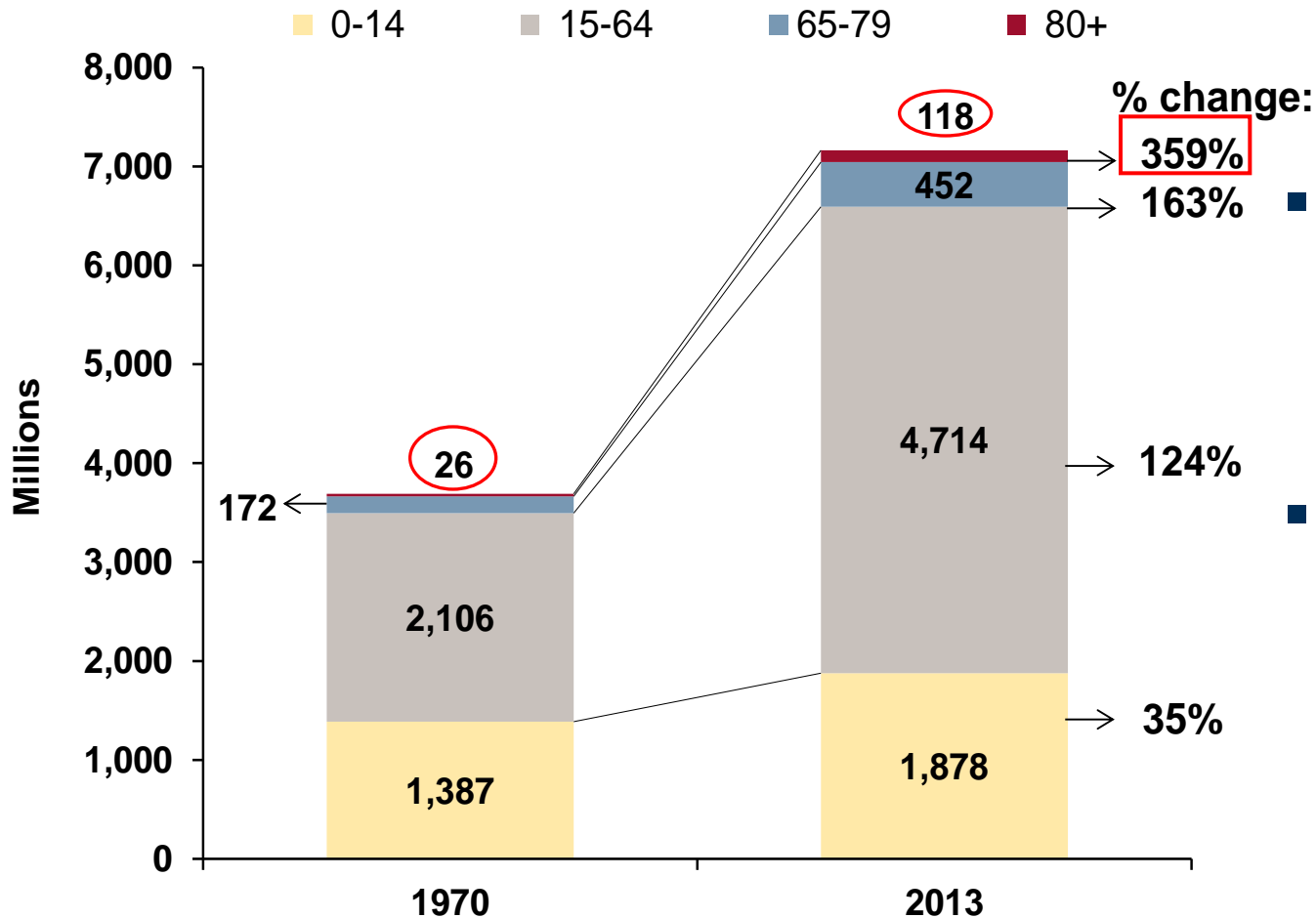
- D** • Discount rates, deficits and debt
- E** • Economic growth, emerging markets
- M** • Mortality risk, mega-cities
- O** • Organization structure & behaviour
- G** • Geopolitical risks
- R** • Retirement risk, real estate, ratings
- A** • Asset prices, asset allocation
- P** • Pensions
- H** • Health, housing
- I** • Inflation, infrastructure, individuals
- C** • Commodities, current account
- S** • Sectors, society, sustainability

Selected demographics research



Global Population & Age Structure: 1970 vs. 2013

World Population Change: 1970 vs. 2013



- Asia has 48% of global 80+ population.
- 80+ women are more than double the number of 80+ men in Europe.

Total Population: 3,691 million

7,162 million 94%

Source: UN, Credit Suisse Demographics Research

CS's **Demographic Manifesto (2000)**: Policy Prescriptions for the mitigation of the demographics time-bomb

Abolition of mandatory retirement ages combined with flexible enabled retirement.

Increased female labour participation rates with use of technology to facilitate women to better balance work life with family.

Selective immigration policies.

Outsourcing and off-shoring.

Source: Credit Suisse Research (2000), *New People, New Jobs—The Demographic Manifesto*

Demographic drivers of real GDP growth

**Working-age
Population Growth**

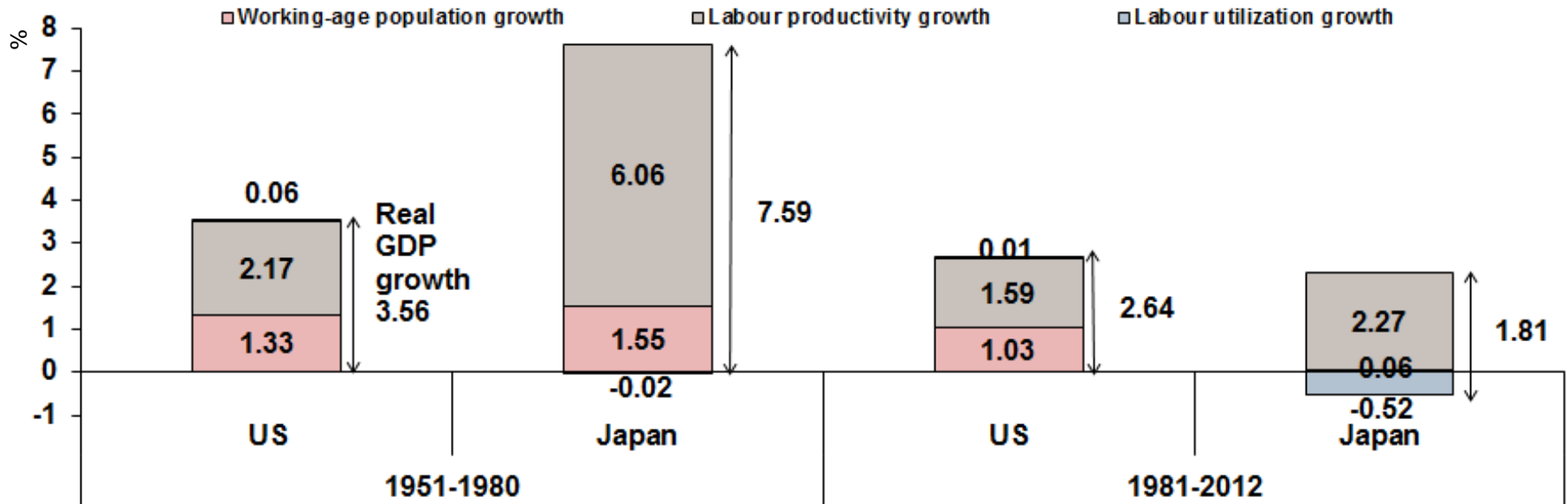
**+ Labour Productivity
Growth**

**+ Labour Utilization
Growth**



Real GDP Growth

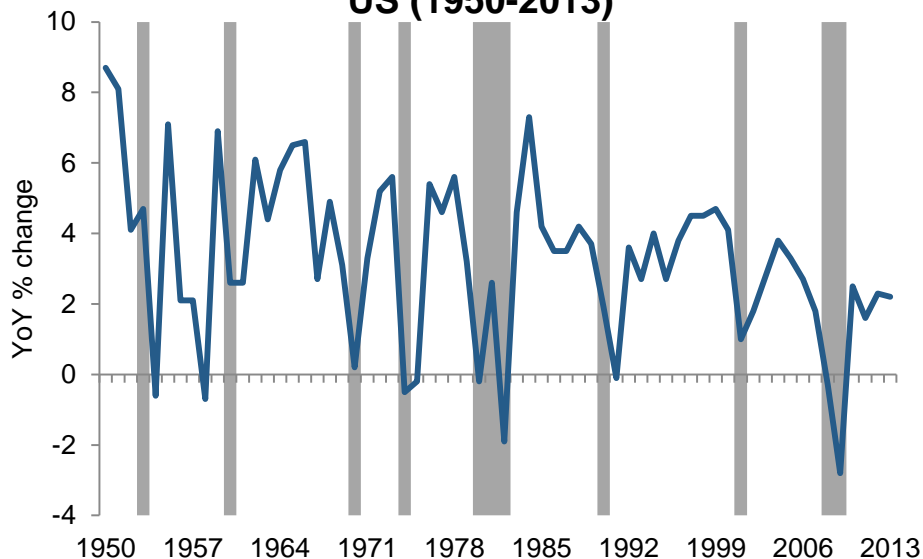
US vs. Japan Real GDP growth decomposition (1951-2012)



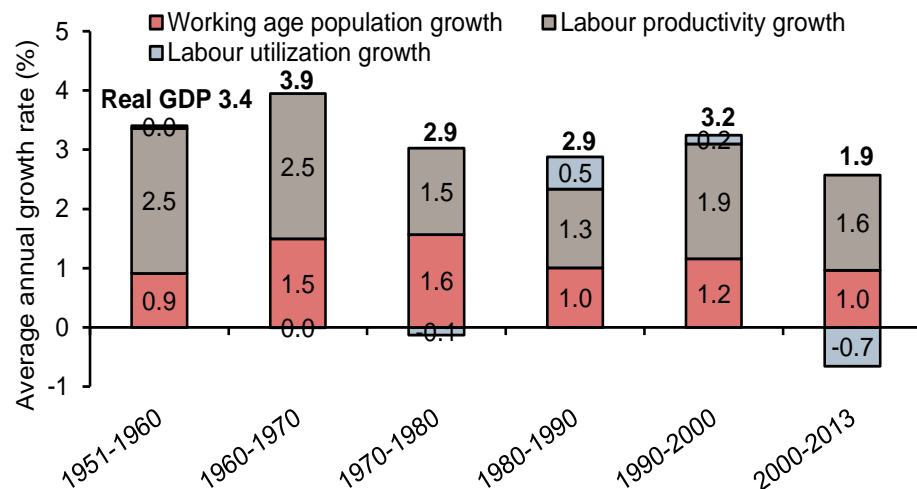
Source: UN, GGDC, Credit Suisse Demographics Research Estimates

Do not write off US GDP growth

Real GDP based on chained 2009 dollars, US (1950-2013)



GDP growth decomposition, US (1950-2013)

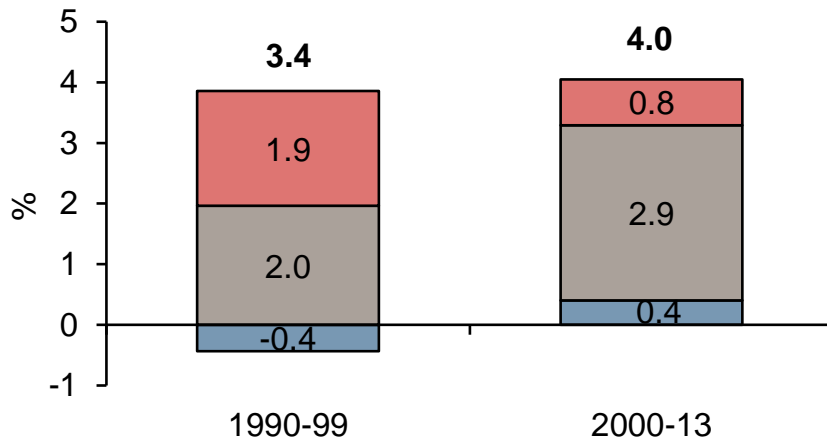


GDP growth projection (2014-2020)				
average growth rate per annum (%)				
	Working age population	Labor productivity	Labour utilization	Real GDP
Scenario 1	0.39	2.1	0.7	3.2
Scenario 2	0.31	1.9	0.7	2.9

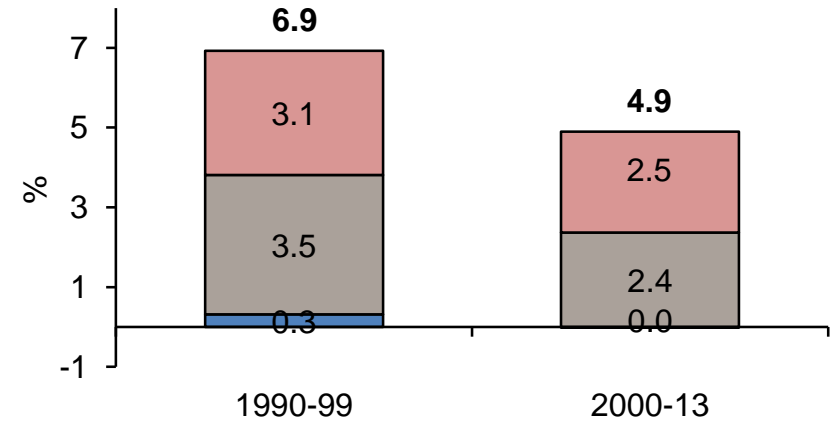
Source: UN, GGDC, The Conference Board, Credit Suisse

Real GDP Growth: Demographic Decomposition

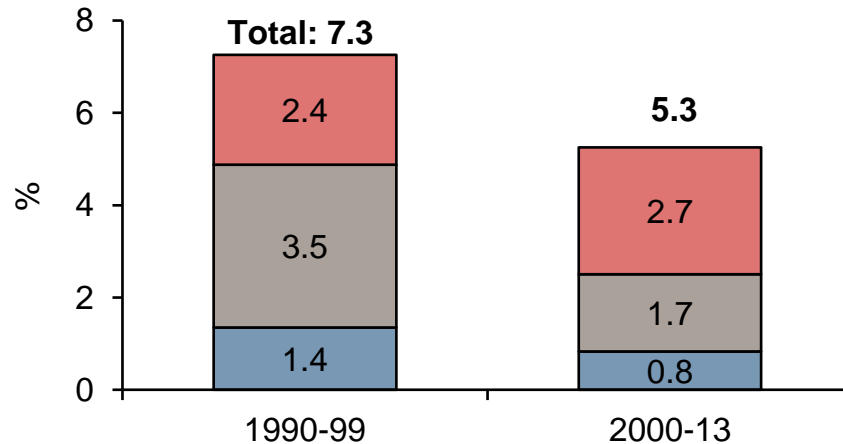
Hong Kong



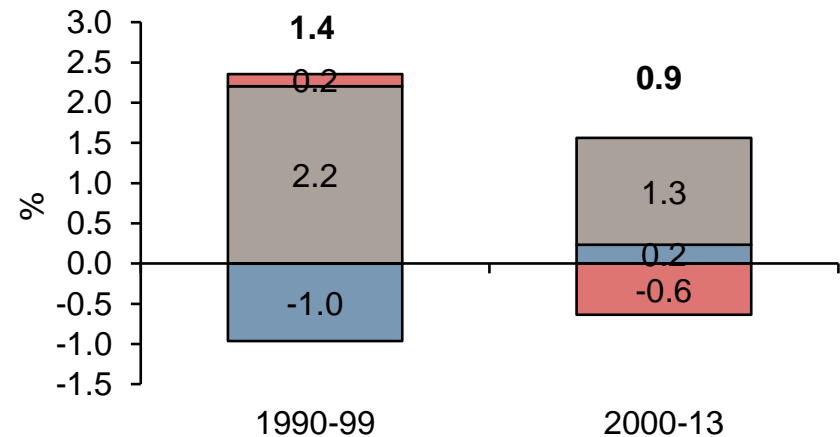
Malaysia



Singapore



Japan

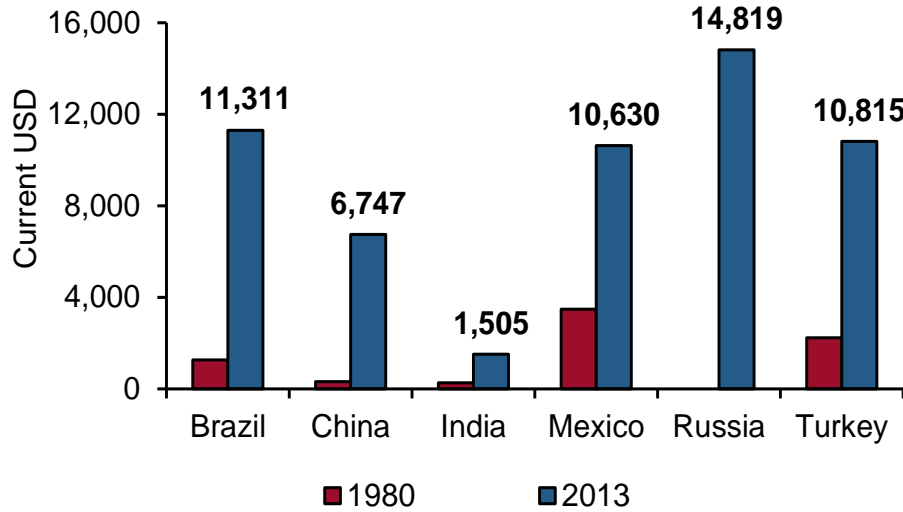


■ Working age population growth
 ■ Labour productivity growth
 ■ Labour utilization growth

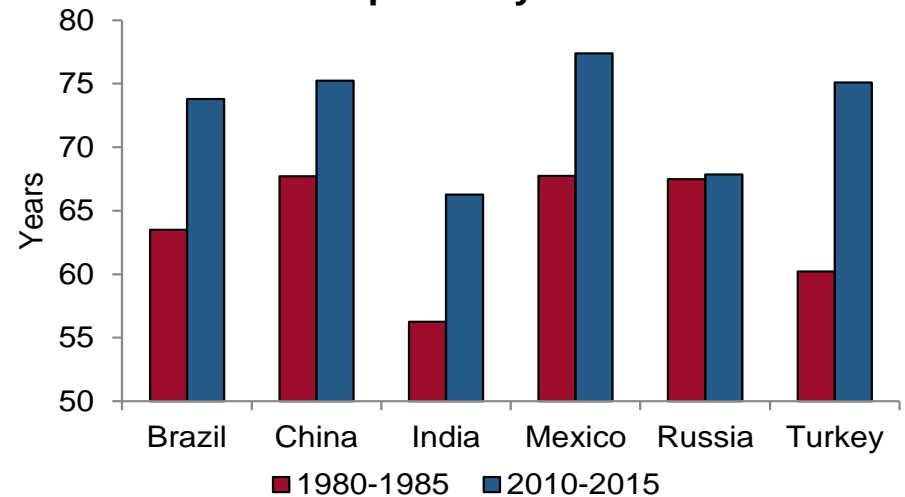
Source: UN, GGDC, Credit Suisse Demographics Research Estimates

Demographics & GDP: EMG6

Per Capita GDP



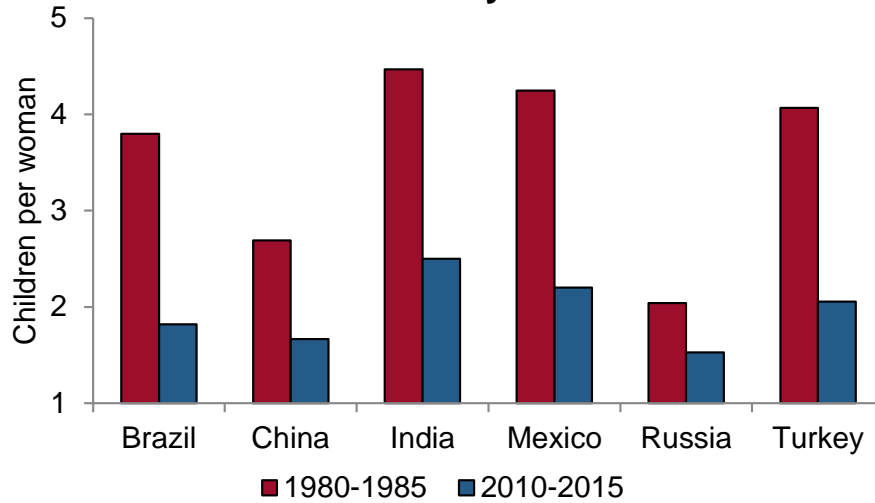
Life Expectancy at Birth



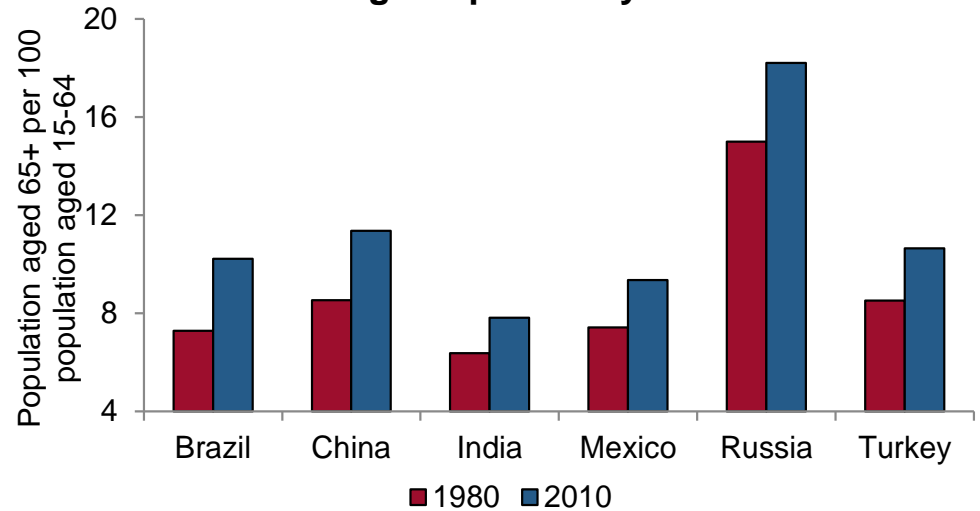
Source: IMF, UN, Credit Suisse Demographics Research

Demographics & GDP: EMG6

Total Fertility Rate



Old-Age Dependency Ratio



Source: UN, Credit Suisse Demographics Research

Demographic Dividends

How Big are the Dividends?

	Contribution of Demographic Dividends to Growth in GDP/N	Actual Growth in GDP/N
	1970-2000, rate per annum	
Industrial Economies	1.03	2.25
East and Southeast Asia	1.90	4.32
South Asia	0.79	1.88
Latin America	1.70	0.94

GDP/N- actual growth in GDP per effective consumer

Demographic Dividend theory attributes **GDP per capita growth to demographic factors.**

First Dividend: Higher participation of population in labour force. Fertility rates fall.

Contribution of Demographic Dividends to growth in GDP/N (1970- 200)

	First	Second	Total
India	0.24	0.91	1.15
Japan	0	1.38	1.38
Indonesia	0.44	1.24	1.68
Malaysia	0.73	1.19	1.91
China	0.81	1.38	2.19
Hong Kong	0.84	1.39	2.23
Singapore	1.16	2.01	3.17
South Korea	0.95	2.29	3.24

Second Dividend: Response to population aging- induces individuals, firms & governments to accumulate.

Source: What is the Demographic Dividend? (IMF, Sep, 2006, Vol 43, No. 3)

GDP: The Expenditures Angle

Demographics affects each component of National Income Identity

$$C + I + G + (X - IM) = GDP$$

C= Consumption, I= Investment, G= Government, X = Exports, IM= imports

GDP by expenditures, 2013							
(% of GDP)							
	China	Hong Kong	India	Indonesia	Malaysia	Singapore	South Korea
Household consumption	34.1	66.1	61.8	59.2	51.0	37.7	52.0
Government consumption	14.1	9.3	11.8	9.1	13.6	10.2	13.9
Gross capital formation	49.3	23.8	30.0	33.6	26.2	29.1	29.0
Exports	26.4	229.6	24.8	23.7	81.9	190.5	53.9
Imports	23.8	228.7	28.4	25.7	72.6	167.5	48.9

Source: World Bank, Credit Suisse

Productivity—the worker angle

Gross value added per worker, 2011			
Thousands of current USD			
	Agriculture	Industry	Services
China	2.8	15.1	11.6
Hong Kong	16.9	41.0	70.5
India*	1.5	5.2	8.7
Indonesia*	2.6	15.9	5.8
Japan	30.6	102.2	101.4
Malaysia	17.1	34.4	16.2
Republic of Korea	17.6	65.7	34.9
Singapore	3.7	66.3	74.1

* 2010 data

Gross Value Added per worker is calculated by:

Gross Value added in each sector (USD)/ Employment in each sector

Source: World Bank, Thomson Reuters Datastream, Singapore Ministry of Manpower, ILO, Hong Kong Census and Statistics Department, Credit Suisse

How Increasing Longevity Affects Us All?

Individuals & families

- Challenge existing asset & time allocation frameworks & intergenerational dynamics.

Governments & societies

- Policy changes in labour, education, health, pensions & social benefits necessary.

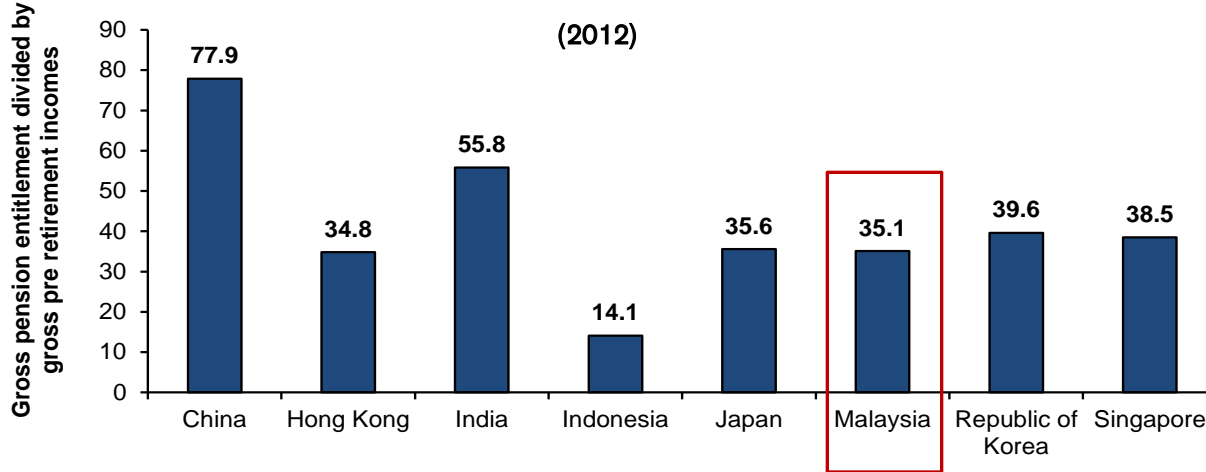
Asset managers, pension funds, insurance cos., SWFs.

- Re-assess frameworks & assumptions. Develop new solutions for clients & new approaches to understanding longevity.

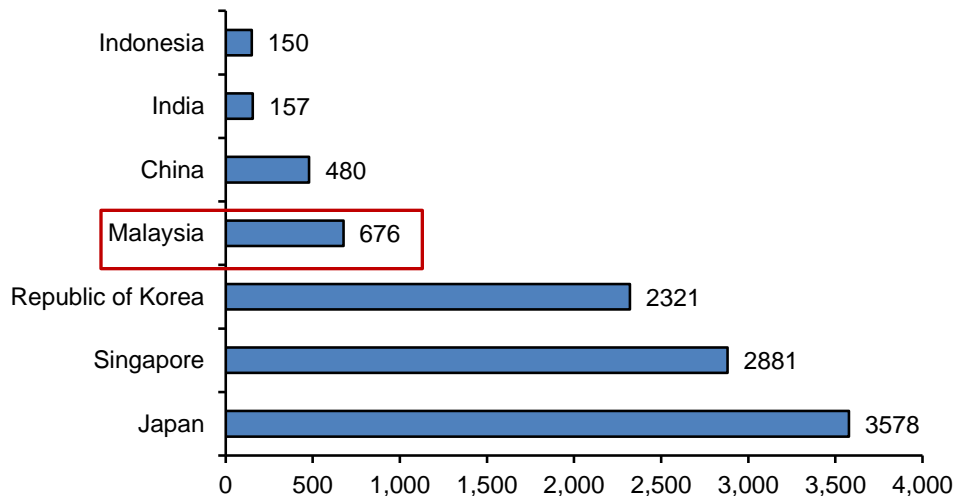
Significant change in thinking and mind-set needed

Pensions (2012) and Health

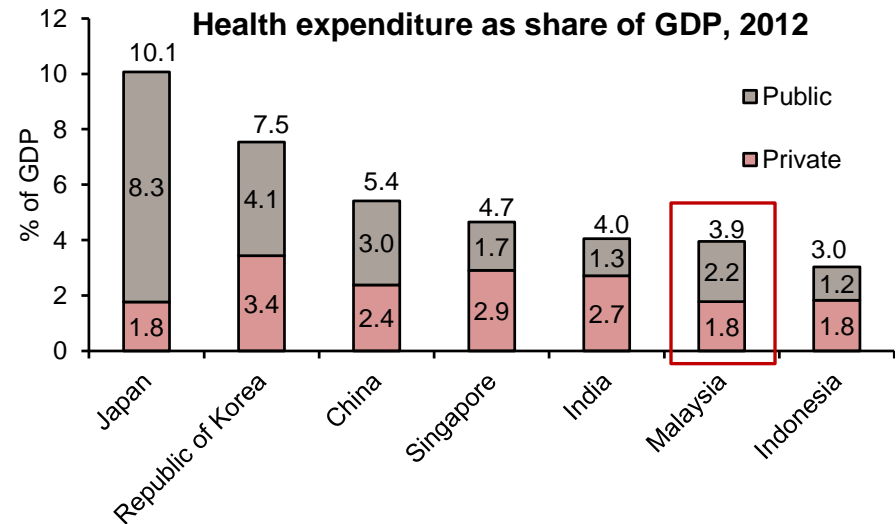
Gross Pension Replacement Rates for the Average Male Earner: Asia



Health expenditure per capita, 2012



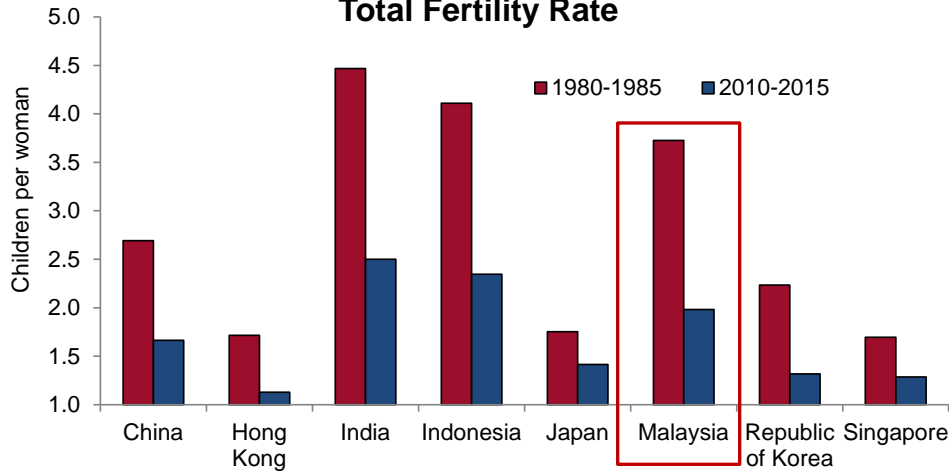
Health expenditure as share of GDP, 2012



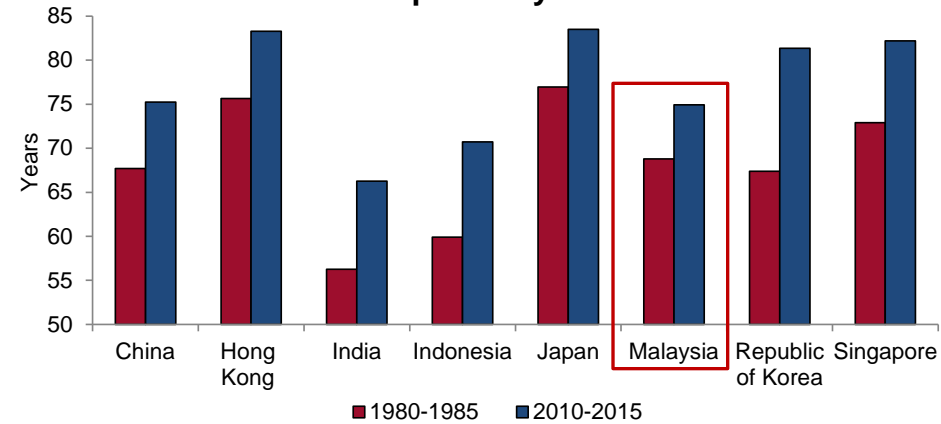
Source: World Bank, OECD

Core Demographic Comparisons: Asia

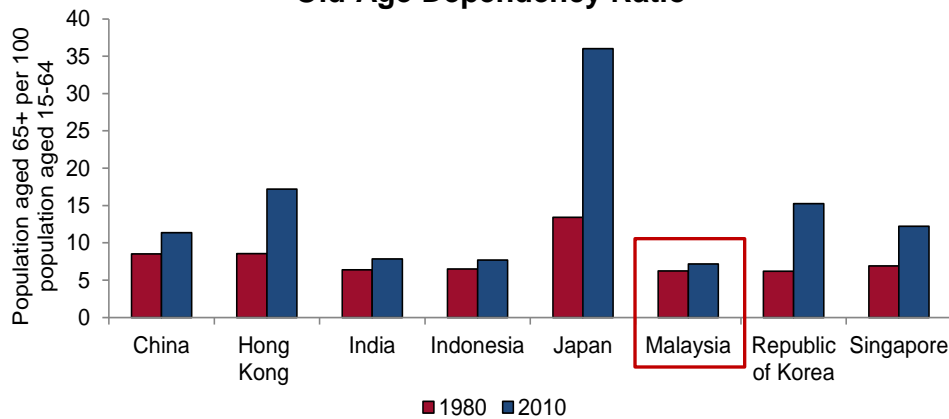
Total Fertility Rate



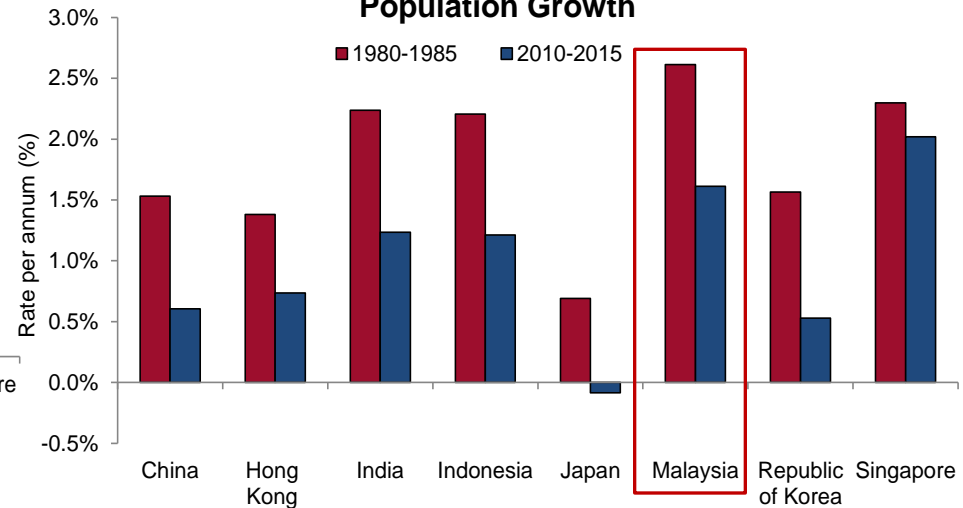
Life Expectancy at Birth



Old-Age Dependency Ratio

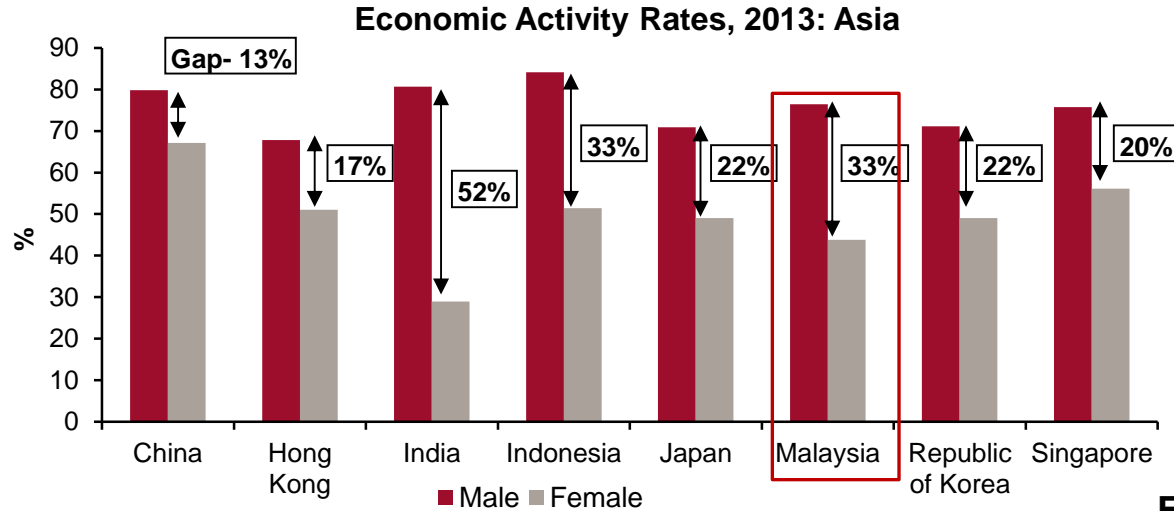


Population Growth

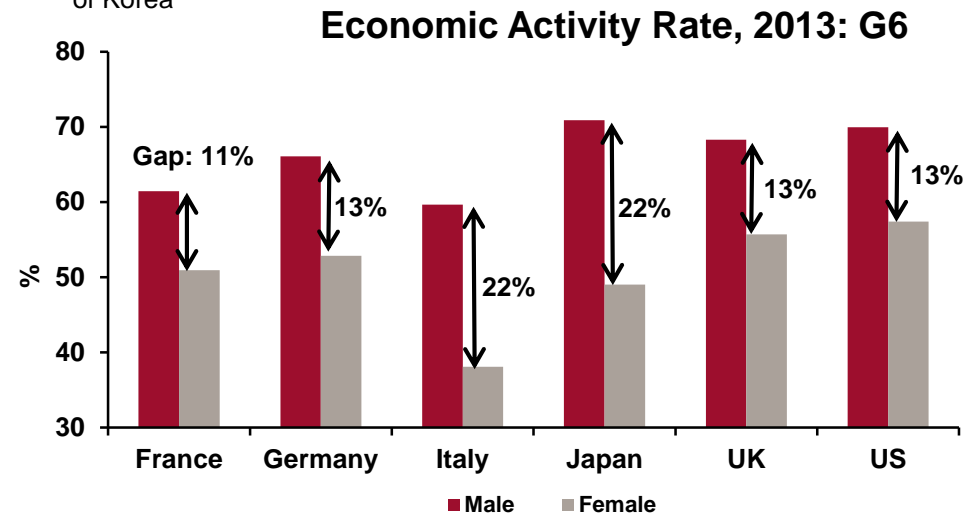


Source: UN, Credit Suisse Demographics Research

Economic Activity Rate, Asia vs. G6



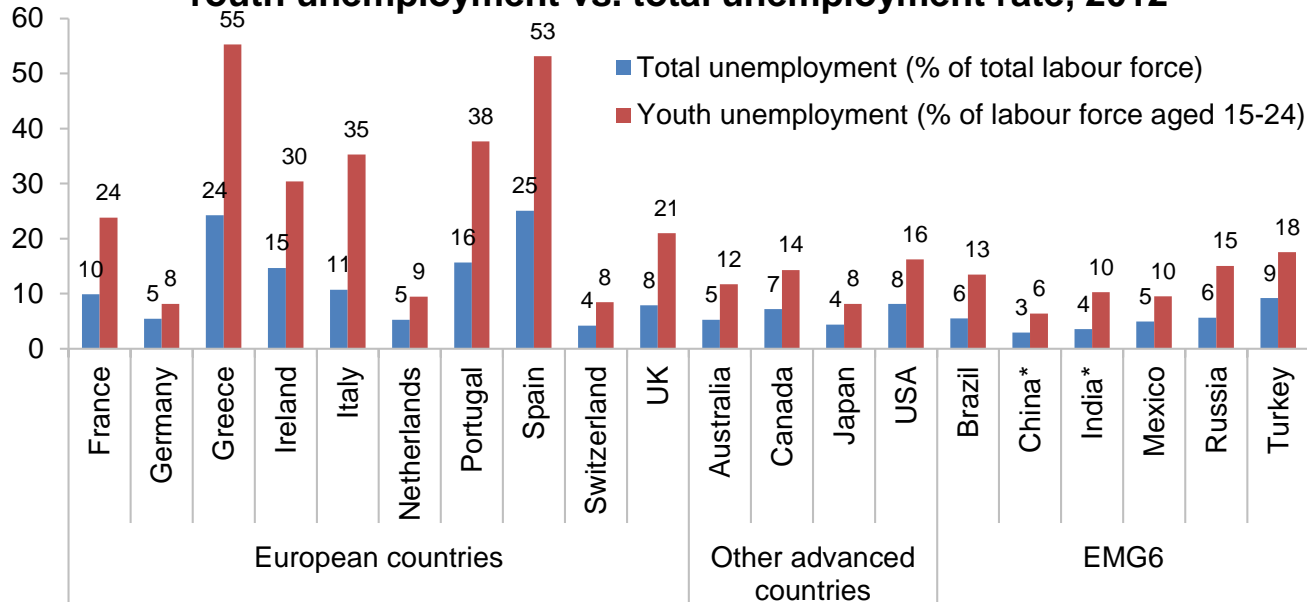
Rising provision of childcare services to working parents is the key policy driver of female labour force participation. (OECD Report)



Source: ILO, UN, Thevenon (2013), "Drivers of Female Labour Force Participation in the OECD" OECD Working Papers No.145, Credit Suisse

Rising youth unemployment

Youth unemployment vs. total unemployment rate, 2012



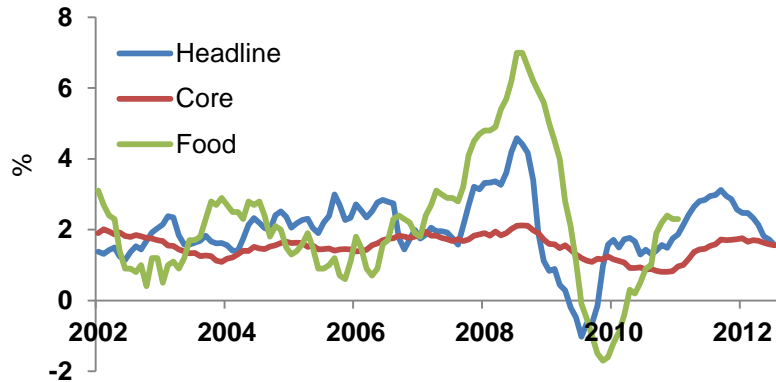
Asian total unemployment vs. youth unemployment, 2012

	Total unemployment	Youth unemployment
	% of total labour force	% of labour force aged 15-24
Hong Kong	3.3	9.3
Malaysia	3	10.3
Singapore	2.8	6.7
Republic of Korea	3.2	9

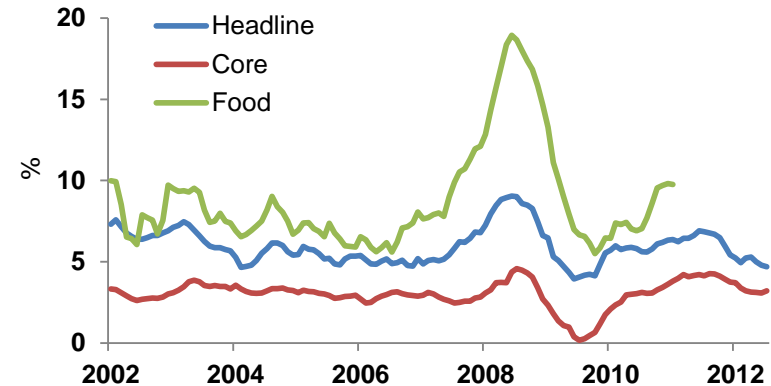
Source: Eurostat, WDI, OECD, ILO, World Bank, IMF, Credit Suisse

Global Inflation drivers: Food Prices & Chinese wages

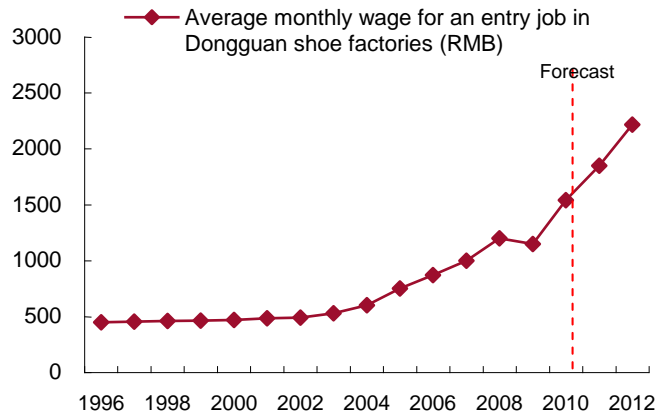
Advanced Economies



Emerging Economies



Rising migrant workers' wages, China



Minimum wage changes, China (2013)

City/Region	Minimum wage (rmb)		Change %
	2,013	Previous	
Shenzhen	1,600	1,500	6.7
Guangzhou	1,550	1,300	19.2
Shanghai	1,450	1,280	13.3
Zhejiang	1,470	1,310	12.2
Beijing	1,400	1,260	11.1
Tianjin	1,310	1,160	12.9
Dongguan	1,310	1,100	19.1

Source: Credit Suisse, various local governments, Dongguan manufacturers, CEIC, Dynamics of non-agricultural transfer of rural labour force in China (Yufen Tong, 2010), IMF

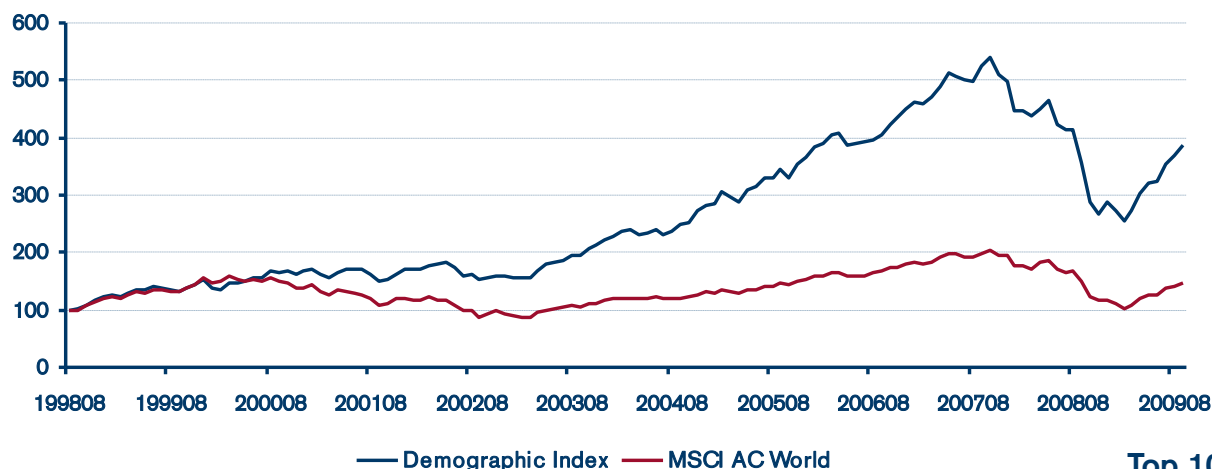
Global Demographics Basket- Historical Performance

Ticker: HTGDEMUS Index

CS Demographics Research team allocates weights across different industry groups.

HOLT scoring criteria for stock selection:

A) operational performance; B) momentum; C) valuation



Demographics Basket versus MSCI AC World	
Excess Return	9.19%
Tracking Error	7.29%
Information Ratio	1.26

Top 10 stocks in the basket by market cap

China Mobile Ltd	Vale sa- pref
Samsung Electronics Co Ltd	Sabmiller Plc
Oracle Corp	Cnooc Ltd.
Cia De Bebidas das Ame-pref	Itau Unibanco Holding S-pref
Qualcomm Inc	CVS Caremark Corp

Note:

- Index returns are measured in local currency, gross of transaction cost.
- Sector weights are assumed to be constant throughout the back-test period.

Source: Indicative Credit Suisse HOLT data, UN, the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Demographics Research

Current Account Balances and Capital Flows

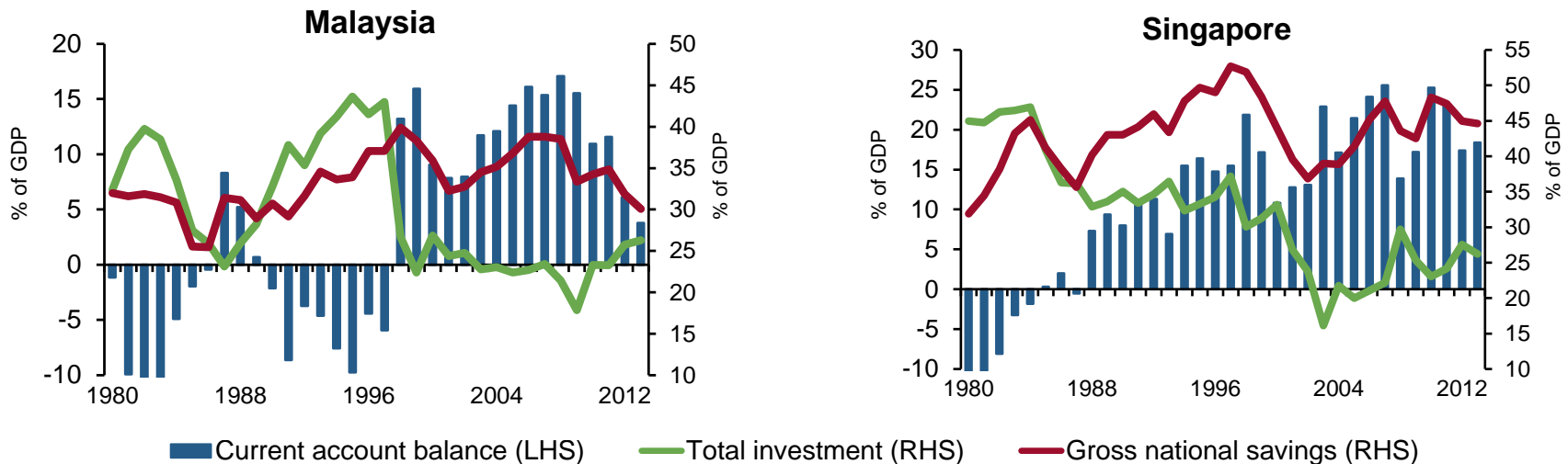
- Jean-Claude Trichet, President of the ECB (23 Feb 2011)
 - ***“Current account balance is an important summary indicator that may signal losses of competitiveness & emerging imbalances.”***
- William Poole, President of the St Louis Fed (17 April 2007)
 - ***“Differential rates of aging across countries are responsible, in part at least, for the extraordinary patterns of current account balances & trade surpluses currently observed.”***
- Axel Weber (25 September 2011)
 - ***“The main objective of capital flow management is to enhance national and global financial stability.”***
- Raghuram Rajan (Fault Lines- Winner of the FT Goldman Sachs Business Book of the Year 2010)
 - ***“The second fault line of the current crisis emanates from trade imbalances and unfettered capital flows from export led countries”.***

Demographics, Savings & Current Account

$$S_p = I + CA + (G - T)$$

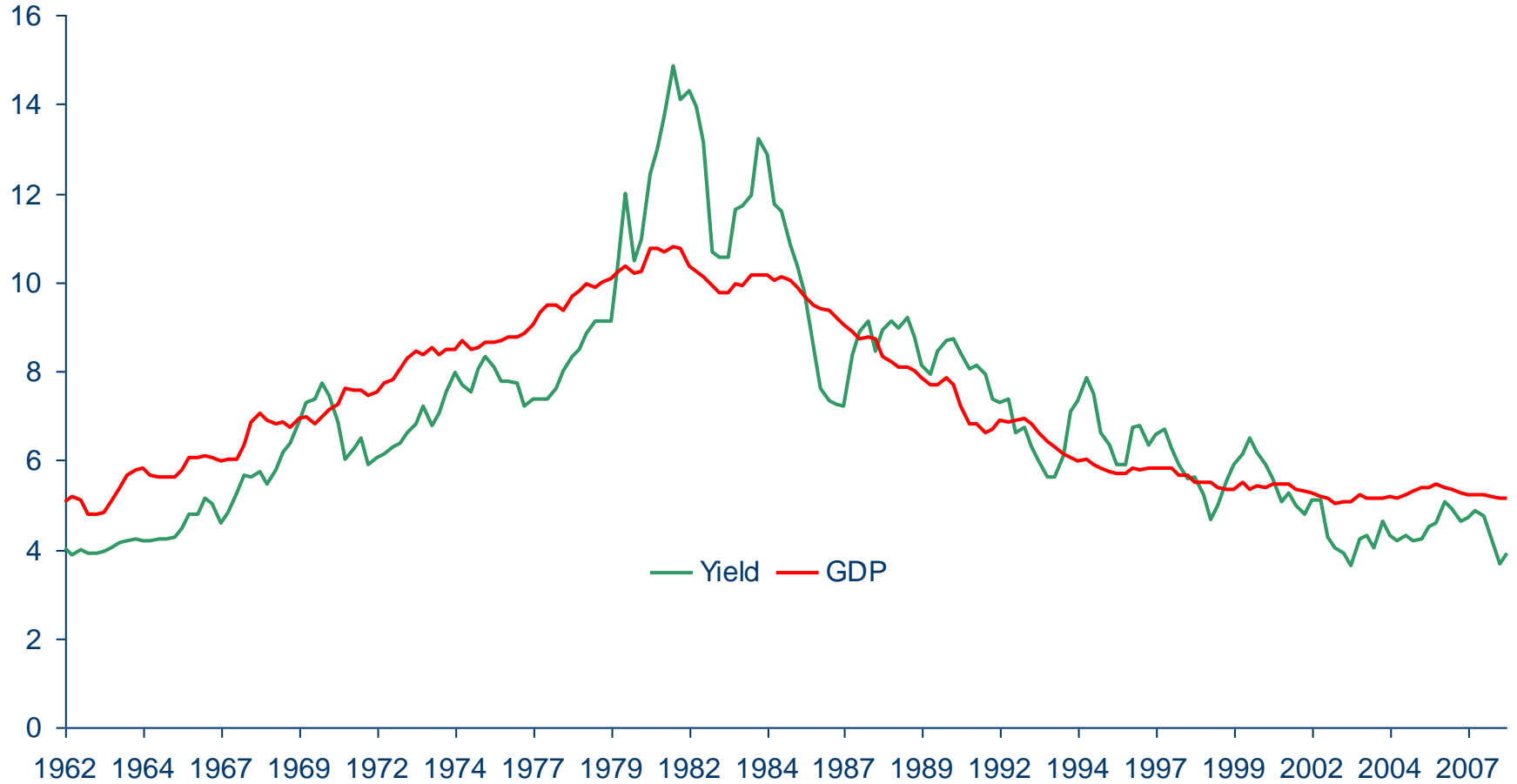
S_p = Private Saving; I = Investment; G = Government Expenditure; CA = $X - IM$ = Net exports; T = Taxes

- We find statistically strong links between **demographic variables & aggregate saving, investment & current account balance.**
- We believe that the **Japanese current account will steadily shrink from current levels and turn negative from 2015.**



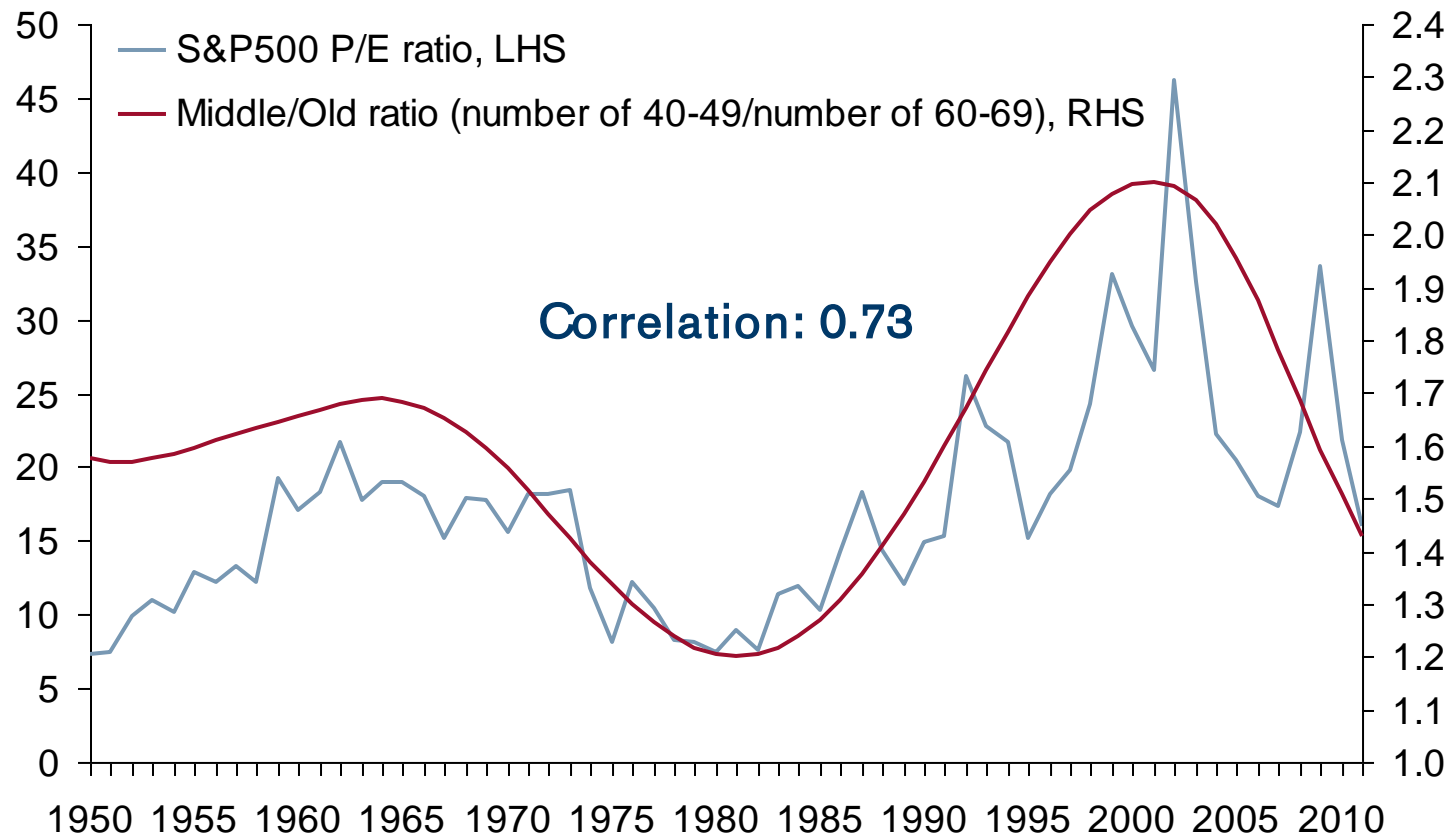
Source: IMF, Credit Suisse Demographics Research (2007)

Long-Term Treasuries Yield vs. smoothed Nominal GDP growth



Source: US Department of Commerce, DataStream, Credit Suisse Demographics Research

US: S&P 500 P/E Ratio and Middle/Old Ratio

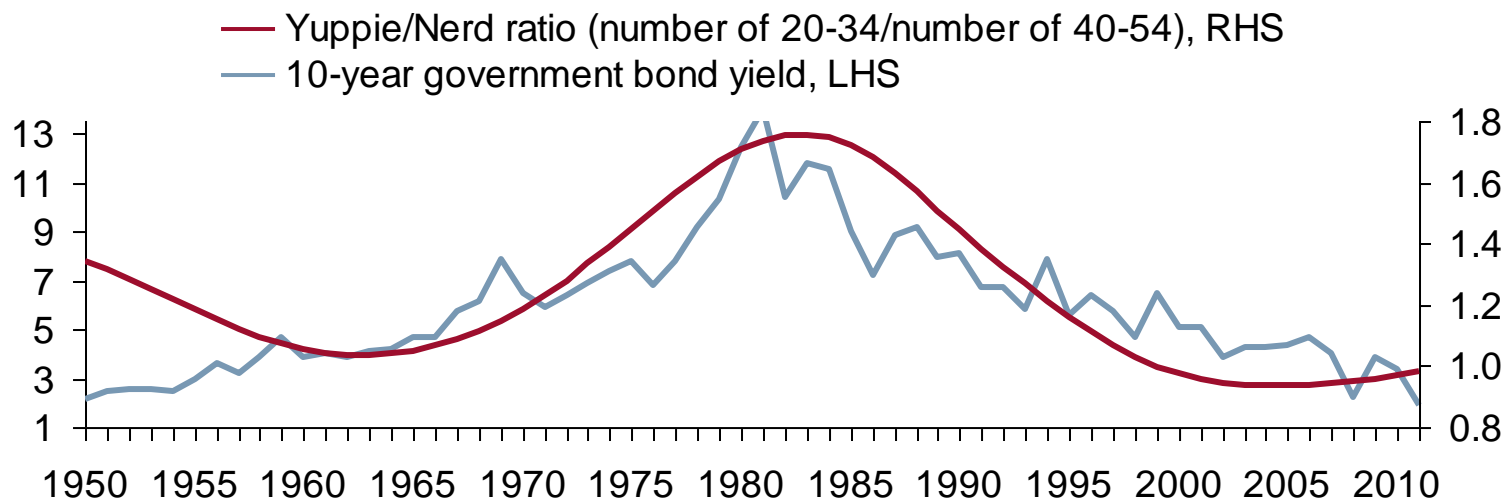


- Weak correlation for France, Germany and Japan.

Source: UN, Online Data Robert Shiller, Credit Suisse Demographics Research

Demographics and Interest Rates

Yuppie/Nerd ratio & 10-year nominal government bond yield: US

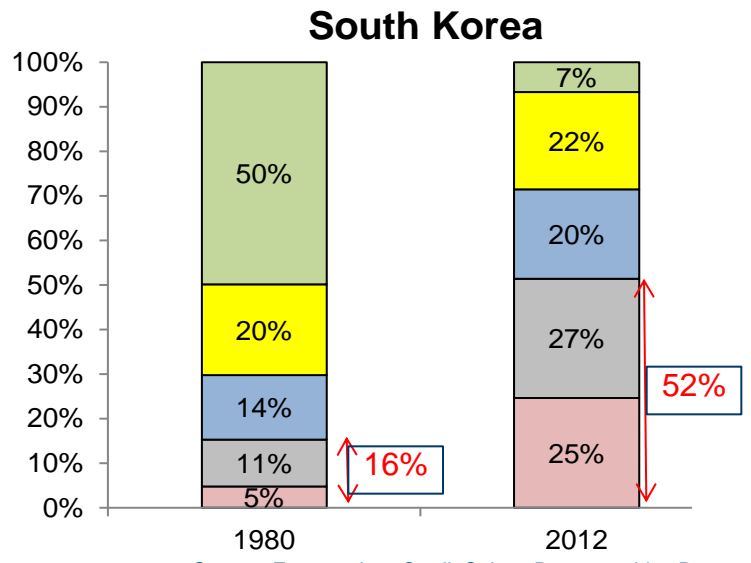
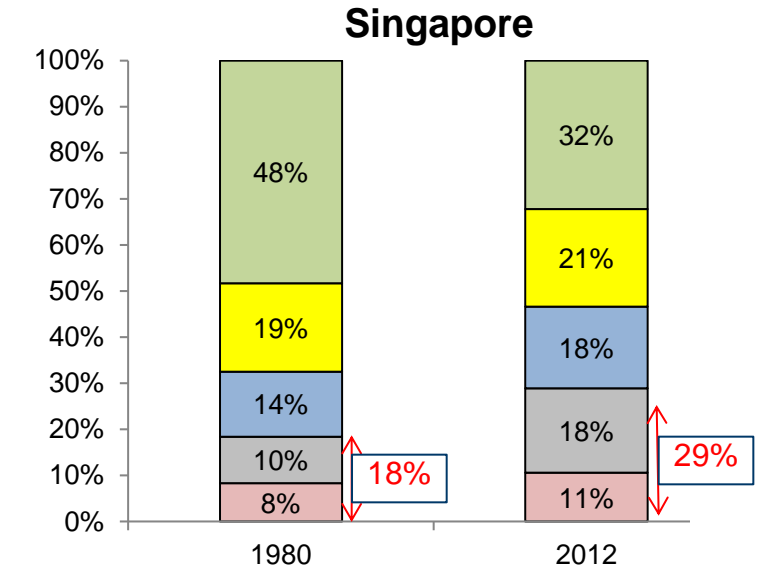
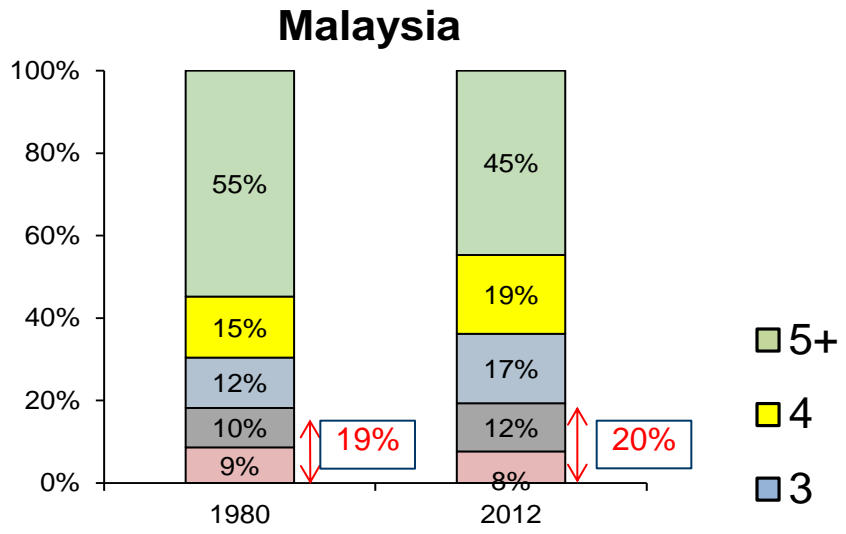
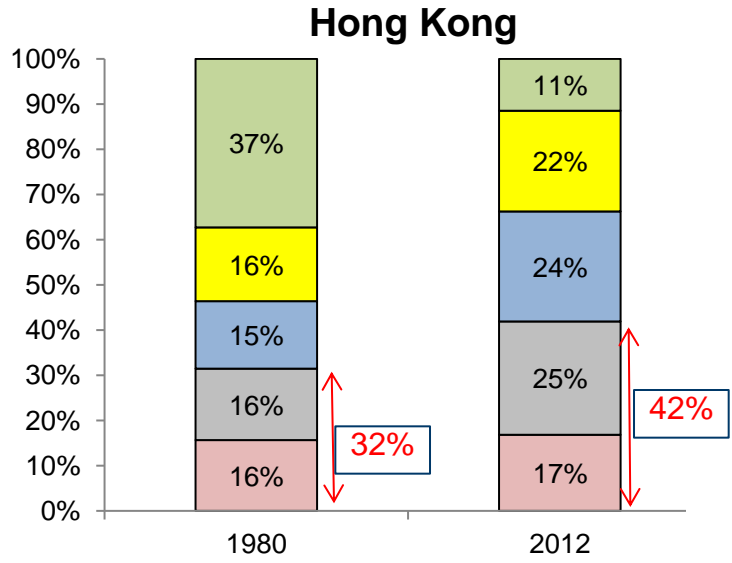


Correlation between Yuppie/Nerd ratio & nominal 10-year government bond yield

Country	Time Period	Correlation
US	1950-2011	0.8
UK	1958-2011	0.81
Japan	1972-2011	0.57
France	1950-2011	0.83
Germany	1950-2011	0.69

Source: Global Financial Data, UN, Credit Suisse Demographics Research

Changing Family Structure: Share by Household Size



- 5+
- 4
- 3
- 2
- 1

Source: Euromonitor, Credit Suisse Demographics Research

Key Sectors Impacted by Demographic Change

INFRASTRUCTURE

- Changing needs for infrastructure in developed world
- Mega-cities growing in the developing world
- Residential, manufacturing, transport, environmental considerations to name a few

NATURAL RESOURCES

- Changing manufacturing processes/locations
- Demands for new products very different from the demand for older products—derived demands too
- Increased demands for hard and soft commodities. Water/Drinking water supplies

LEISURE & LUXURY

- Work-Leisure trade-off changes for old as well as young.
- Wealth of retirees, ease of travel, ease of shopping
- Lower costs of communication, travel and insurance
- Information and Technology advances

EMERGING MARKETS

- Growing importance due to economic power
- Global labour force
- Global manufacturing locations
- Outsourcing
- Demand side

PHARMA & BIOTECH

- Longer post-retirement life of growing number of retirees.
- Desire of retirees to enjoy a good quality of life
- New pharma and biotech needed for mental health and new illness
- Genomics, pharma and biotech research need to find new cost-effective drugs and treatments

FINANCIAL SERVICES

- Active Asset allocation, New product development and Risk Management will be cornerstones
- DB to DC shifts
- Newer ways of delivering pensions and insurance
- Technology

“The reason these sectors are positively affected is not merely due to the fact that the number of people in the elderly population has increased, but also that the composition, family structure and behavioural characteristics of the elderly, as well as the young population, is vastly different compared to the past”

Demographic insights into policy: Asia's Big 3

China's 12th 5-year plan

Objective:

Inclusive growth by reducing wealth disparities & rebalancing economy

Key policies:

- Land rights & hukou reform
- Address gender imbalance
- Rural education reform
- Centralize pension system

India's 12th 5-year plan

Objective:

Faster, more inclusive & sustainable growth

Key policies:

- Improve education
- Enhance agricultural productivity
- Better gender balance
- Increase pensions coverage & access to public healthcare

Japan's "Three-arrows" Abenomics

Objective:

Improve market expectation & real economy through monetary, fiscal policies & structural reforms

Key policies:

- Agricultural reforms
- Increase labour flexibility
- Reduce pensions & health government expenditure
- Close gender gap in employment

Population Density & Water/Sanitation Access

Population Density (2010)

City	Country	City population (millions)	Metro population (millions)	Density People/sq km
Mumbai	India	13.9	21.2	43,802
Karachi	Pakistan	15.5	18.0	34,749
Kolkata	India	5.1	15.4	29,040
Shenzhen	China	4.3	8.6	18,489
Delhi	India	12.1	16.7	12,906
Lagos	Nigeria	7.9	9.1	12,362
London	UK	7.6	12.2	7,517
Tokyo	Japan	8.7	31.0	4,438
Paris	France	2.1	11.8	4,322
Berlin	Germany	3.4	3.9	4,007
Los Angeles	USA	3.8	12.9	2,984
Rotterdam	Netherlands	0.6	1.2	2,235

% of rural population with access to				
	Improved sanitation facilities		Improved water source	
	1990	2012	1990	2012
China	15	56	56	85
India	7	25	64	91
Mexico	35	79	59	91
Turkey	66	76	73	99
% of urban population with access to				
	Improved sanitation facilities		Improved water source	
	1990	2012	1990	2012
China	48	74	97	98
India	50	60	89	97
Mexico	78	87	92	96
Turkey	96	97	94	100

Source: MDG's (Asia Pacific) Organisation, City Mayor, UN, World Bank, Credit Suisse

Pension Fund Asset Allocation

Pension Fund Asset Allocation (2001 vs. 2013)								
	2001				2013			
	Equities	Bonds	Cash	Other	Equities	Bonds	Cash	Other
Australia	62%	19%	5%	14%	54%	13%	8%	25%
Canada	62%	26%	2%	10%	48%	29%	2%	21%
Japan	52%	46%	0%	2%	40%	51%	3%	6%
Netherlands	44%	44%	11%	1%	35%	50%	0%	15%
Switzerland	36%	35%	20%	9%	33%	31%	7%	28%
UK	67%	18%	5%	10%	50%	33%	3%	14%
US	65%	28%	2%	5%	57%	23%	0%	20%

DB-DC Asset Split Change (2001-2013)

	2001		2013	
	DC	DB	DC	DB
Australia	83%	17%	84%	16%
Canada	3%	97%	4%	96%
Japan	0%	100%	3%	97%
Netherlands	2%	98%	5%	95%
Switzerland*	49%	51%		
UK	8%	92%	28%	72%
US	52%	48%	58%	42%

*DC assets in Switzerland are cash balance plans and are excluded from the analysis in 2013.

Total Pension Assets - 2013

	Total Assets (USD billion)	% of GDP
Australia	1,565	105%
Canada	1,451	80%
Japan	3,236	65%
Netherlands	1,359	170%
Switzerland	786	122%
UK	3,263	131%
US	18,878	113%
Total	31,980	83%

Source: Towers Watson (2013)

Conclusions

- Demographics is about “**consumers and workers**”. It underpins **growth, fiscal sustainability, inflation & asset prices**. Monetary & fiscal policy need to change in order to address the changing demographics.
- Demographic changes create many **potential opportunities for financial services industry** in terms of product innovation, risk diversification & asset allocation.
- **Sectors** demographically advantaged: EM, infrastructure, natural resources, financial services, pharma & biotech, leisure & luxury.
- We show **demographics links with top-most policy priorities** of China, Japan & India.
- Asian emerging markets are demographically very **diverse**. Their future growth depends on how they meet the **challenges of slower population growth & rapid ageing**.
- Maintaining China’s outstanding growth experience requires major structural changes at the micro level of consumers and workers: **reform of the hukou system, agricultural land system, health, education & training systems**.
- Asian demographic dividend capture depends crucially on **prudent & holistic policy reform**.

Credit Suisse Demographics Research

- **A Demographic View: Do not write off US GDP growth (2014)**
- **World Cup 2014 Countries: Spotlighting Demographics (2014)**
- Exploring how demographics affects sovereign spreads (2014)
- **Americas' Demographics & their effects (2014)**
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