The 2040 economy: Long-term growth determinants

12 November 2014

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Pascal Huet, Director Economy & Air Transport, Airbus

G. Mustafa Mohatarem, Chief Economist, Public Policy Center, General Motors Company
1974-2014 in numbers

- **3.553**: Increase in world population between 1970 and 2014
- **4.5**: Increase in number of persons aged 80 and above between 1970 and 2014
- **3.4%**: Percentage increase in real GDP between 1980 and 2014
- **30%**: Share of population aged 0 to 14 in 2014
- **5.5%**: Percentage increase in world exports between 1980 and 2014
- **1.4**: Increase in number of persons aged 0 to 14 between 1970 and 2014
### 2014-2040 in numbers

- **3.553**
  - Increase in world population between 2014 and 2040

- **1.795**
  - Increase in number of persons aged 0 to 14 between 2014 and 2040

- **3.4%**
  - Percentage increase in real GDP between 2014 and 2040

- **3.1%**
  - Percentage increase in number of persons aged 80 and above between 2014 and 2040

- **4.5%**
  - Percentage increase in real GDP between 2014 and 2040

- **5.5%**
  - Percentage increase in world exports between 2014 and 2040

- **22%**
  - Share of population aged 0 to 14 in 2040

- **1.4**
  - Increase in number of persons aged 0 to 14 between 2014 and 2040

- **1.05**
  - Percentage increase in world exports between 2014 and 2040

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Key questions for the coming decades

• Can emerging countries sustain the growth rates they have recently achieved?
  • How long will it take them to reach the GDP per capita level of advanced economies?

• Will wage disparities continue to drive globalisation or will these disappear over time?

• Will trade continue to outpace GDP growth?
  • If so, will the benefits diffuse to the domestic economies and be broadly distributed, or will it increase regional disparities?
  • If not, will growth be mainly domestic driven or regionally driven? Will the type of goods that are traded change?

• How much will technological progress support growth?
  • The emerging countries could skip some steps on the development ladder
  • The new technologies could foster a return to localised production systems
BRICS: TEMPORARY STUMBLE OR LONGER SLOWDOWN?

MUSTAFA MOHATAREM

Chief Economist, General Motors
INTRODUCTION

• BRICs appear to have decoupled from the developed countries following the global financial crisis

• Timely stimulus and strong starting positions allowed them to sustain growth as others stumbled

• The euphoria is slowly melting away
  – China is slowing
  – India slowed, but is making a slight comeback
  – Brazil is stagnant
  – Russia is on the verge of a recession

• Is this a stumble, or harbinger of longer-term slowdown?
Emerging economies became a major source of world economic growth after 2001 with China leading the way.

**Contribution to Global Real GDP Growth**

- Other Developing Economies
- Brazil, India, Russia, Indonesia, South Africa, Turkey
- China
- Advanced Economies
- World Growth

Source: World Bank; Calculations: General Motors Company
BUT NOW THEY ARE SLOWING COLLECTIVELY

Real GDP Growth of Large Emerging Economies
China, India, Brazil, Russia, Indonesia, South Africa, Russia

Source: World Bank; Calculations: General Motors Company
Pre-crisis growth among emerging markets was believed to be consistent with the Washington Consensus – the set of development strategies focusing, in part, on macroeconomic stability, privatization, and liberalization.

Emerging markets posted mixed economic performance during the Great Recession.

Post-crisis developments highlight economic vulnerabilities with emphasis on addressing economic imbalances, structural inefficiencies, and policy mismanagement.

## POST-CRISIS, SLOWDOWN IN EMERGING MARKET GROWTH IS BROAD

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Source: World Bank; Calculations: General Motors Company
IT IS NOT GUARANTEED THAT GROWTH WILL RETURN TO THE GOLDEN DAYS AS EMERGING ECONOMIES LACK ROBUST INSTITUTIONS THAT PROVIDE LONG TERM STABILITY

Standard Deviation of Real GDP Growth

10-year moving average

Source: World Bank; Calculations: General Motors Company
BRAZIL IS ONE TYPICAL EXAMPLE

After the period of what some called an economic miracle in 1968–73 with more than 11% growth, the economy fell back to slow and volatile pattern with 3.0% in the 80s and 1.7% in the 90s.

Source: World Bank

Note: 2014 real GDP growth is a forecast
FISCAL AND EXTERNAL IMBALANCES AND INFLATIONARY PRESSURE RESTRICTING GROWTH POTENTIAL

Gov’t Budget Balance, % of GDP*

15
10
5
0
-5
-10
-15

Current Account Balance, % of GDP**

Twin Surpluses

Twin Deficits

TRY
ZAR
IDR
BRL
RUB
EUR
USD
INR
JPY

Source: National Central Banks
AFTER THREE DECADES OF 10% ANNUAL GROWTH, CHINA HAS BECOME A SIGNIFICANT PLAYER IN WORLD ECONOMY; AS GROWTH SLOWS DOWN, WHAT WILL HAPPEN TO WORLD PRICES?

Source: China Customs
WHAT IF CHINA CONTINUES TO FOLLOW JAPAN’S PATH AS IT HAS FOR THE PAST DECADES -- GROWTH FALLING TO 4% INSTEAD OF THE WIDELY EXPECTED 6-7%?

Per-Capita GDP vs. Long Term Growth

Source: World Bank, Conference Board; Calculations: General Motors Company
WILL INDIA LIVE UP TO ITS EXPECTATIONS WITH SIGNIFICANT STRUCTURAL IMBALANCE REMAINING IN ITS ECONOMY?

Source: India Ministry of Statistics/Programme Implementation, Reserve Bank of India
FALLING OIL PRICES WILL FURTHER DEPRIVE RUSSIAN ECONOMY

Year Over Year Real GDP Growth

Source: Federal State Statistics Service/Central Bank of Russia

Source: The Economist
POST RECESSION, GLOBAL TRADE HAS BEEN VERY SLOW, PROVIDING LESS LIFT TO ECONOMIES THAT DEPEND ON EXPORTS

Source: International Monetary Fund
COMPETITION WILL INTENSIFY AMONG EXPORT DEPENDENT COUNTRIES. IS JAPAN STARTING A CURRENCY WAR?

Both Korean Won and Chinese Yuan have appreciated against Japanese Yen by 30% since 2010. It is hard to believe the Korean and Chinese governments will watch at the sideline if the Yen continues to weaken by design.

Source: Wall Street Journal
LAST, THERE ARE SO MANY UNPREDICTABLE FACTORS -- FROM GEOPOLITICAL SHIFTS TO NATURAL DISASTERS -- THAT COULD CHANGE THE COURSE OF ECONOMIC DEVELOPMENT AND THROW ECONOMIC FORECASTS OFF TRACK

2011 – a year full of unknowns

<table>
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<th>Event</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
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<th>Oct</th>
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<td>Arab Spring Revolution</td>
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<td>Japanese Earthquake</td>
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<td>Severe Weather in the U.S.</td>
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<td>European Debt Crisis</td>
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<td>U.S. Debt Ceiling Debate</td>
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<td>Thailand Flooding</td>
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Source: GM compiled data
SUMMARY

- Considerable uncertainty regarding the near term outlook for the large emerging economies
- Led economic growth in the 2000s
- Outperformed following the global financial crisis
  - Timely stimulus
  - Government intervention
  - Dividend from the “Washington Consensus”
- Policies will have to change to restore growth momentum
- Will politics allow the necessary change?
Air transport outlook
The first commercial flight was 100 years ago

Aviation’s benefit

- 23 minutes
- 2 hours
- 4 – 12 hours
- 20 hours
Aviation is a major driver of the world economy

- **2,970,000,000** passengers carried
- **$6.4 trillion** worth of cargo shipped by air
- **2%** of global man-made CO₂ emissions come from aviation

Globally contributes

- **58.1 million** Job supported World-wide
- **$2.4 trillion** Aviation’s global economic impact
- **21st** If aviation was a country ranked by GDP

Source: ATAG (2012 figures), Airbus
Future of Air Transport

The “Inspired entrepreneurs”

They can feel

The “market analyst”

They can calculate

Traffic = f(X, Y, Z, W^2)
25 years ago....
Air travel has proved to be resilient to external shocks

World annual traffic (RPKs - trillions)

Source: ICAO, Airbus

73% growth through multiple crises over the last ten years

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Air fares negatively driven by fuel price surge since 2003

Airline fuel expenses (billion $)

Share of total costs


$46 $43 $40 $44 $65 $91 $116 $133 $187 $123 $138 $174 $208 $210

14% 13% 13% 14% 22% 26% 27% 33% 26% 26% 29% 31% 31%

Source: ICAO, Airbus
World inflation adjusted average yield stabilizing after strong decrease in the 80s and the 90s

Cents per RPK in 2013 US$

Source: ICAO, IATA, Airbus
Globalisation has been an important driver

Number of bilateral air services agreements

More than 2,550 bilateral air services agreements between more than 170 countries

Source: ICAO WASA database, Airbus
Despite “ups and down”, GMF traffic forecasts track the long term trend

Source: ICAO, Airbus
High oil prices here for the long term…

Brent oil price (nominal US$ per bbl)

Source: IEA, IHS Energy, Airbus
Passenger traffic is highly correlated to GDP growth

Source: IHS Global Insight, ICAO, Airbus
Underlying drivers indicate a positive economic outlook

Source: IHS Global Insight, Airbus
A two-speed economic world

Comparison of year-over-year GDP growth

Emerging economies will continue to lead the pack

* 54 emerging economies
** 32 advanced economies

Source: IHS Global Insight, Airbus
The World of 2040 will be very different from today

<table>
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<tr>
<th>1990</th>
<th>2015</th>
<th>2040</th>
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<tr>
<td>1- US</td>
<td>1- US</td>
<td>1- China</td>
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<tr>
<td>2- Japan</td>
<td>2- China</td>
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<td>5- Italy</td>
<td>5- UK</td>
<td>5- Brazil</td>
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<td>6- Russia</td>
<td>6- France</td>
<td>6- Germany</td>
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<td>7- India</td>
<td>7- India</td>
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<td>8- Brazil</td>
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<td>9- Russia</td>
<td>9- Russia</td>
<td>9- Russia</td>
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<tr>
<td>10- Italy</td>
<td>10- Italy</td>
<td>10- France</td>
</tr>
</tbody>
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Source: IHS Global Insight, Airbus

GDP ranking based on nominal GDP expressed in US$
Emerging economies are driving future growth

1990
- GDP (Nominal GDP in US$): 15%
- Population: 70%
- Passenger trips: 17%
- Fleet in service: 15%

Today
- GDP (Nominal GDP in US$): 36%
- Population: 69%
- Passenger trips: 42%
- Fleet in service: 38%

2033
- GDP (Nominal GDP in US$): 54%
- Population: 67%
- Passenger trips: 59%
- Fleet in service: 50%

Source: IHS Global Insight, Ascend, Airbus
North Americans and Europeans are the most willing to fly today…

22% of the population of the emerging countries took a trip a year in 2013.

Source: Sabre (annualized September 2013 data), IHS Global Insight, Airbus

*Passengers originating from respective country

Bubble size proportional to population

2013 trips per capita

2013 GDP per capita (thousands $US)
…but by 2033, China’s potential will reach European levels

66% of the population of the emerging countries will take a trip a year in 2033

Source: Sabre (annualized September 2013 data), IHS Global Insight, Airbus

*Passengers originating from respective country
Bubble size proportional to population

India 2033
0.26 trips per capita

China 2033
0.95 trips per capita

2033 trips per capita

2033 GDP per capita (thousands $US)
Urbanisation to increase

World population and share of urban agglomeration evolution

Urban population:

1950: 1.3B
1960: 2.3B
1970: 3.5B
1980: 4.7B
1990: 5.0B
2000: 5.5B
2010: 5.7B
2020: 6.0B
2030: 6.3B
2040: 6.6B
2050: 6.9B

Source: UN population division, Airbus
Global Middle Class to more than double

Global Middle Class**
(Millions of people)

<table>
<thead>
<tr>
<th>Year</th>
<th>Emerging countries</th>
<th>North America</th>
<th>Europe</th>
<th>World Population</th>
<th>% of world population</th>
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</thead>
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<tr>
<td>2013*</td>
<td>2,356</td>
<td>1,413</td>
<td>679</td>
<td>7,200</td>
<td>33%</td>
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<td>2023</td>
<td>3,740</td>
<td>2,782</td>
<td>697</td>
<td>7,900</td>
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<tr>
<td>2033</td>
<td>5,375</td>
<td>4,450</td>
<td>673</td>
<td>8,500</td>
<td>63%</td>
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</table>

Source: Kharas and Gertz, Airbus
* EOY 2013

** Households with daily expenditures between $10 and $100 per person (at PPP)
Tourism stimulates economic and air transport growth

Source: World Tourism Organization, OAG, IHS Global Insight, Airbus

* Compound Annual Growth Rate
Aviation, the first contributor to international tourist arrivals growth

Worldwide international arrivals by type of border crossing

1995
- Air: 45%
- Sea: 5%
- Rail: 48%

529 million tourists

CAGR* 1995-2012 (%)
- Air: 5.5%
- Road: 4.1%
- Sea: 2.3%
- Rail: 1.5%

2012
- Air: 58%
- Sea: 36%
- Rail: 5%

1,035 million tourists

Source: World Tourism Organization, Airbus

* Compound Annual Growth Rate
Visiting friends and relatives is a key driver of traffic growth

...of all trips are for Visiting Friends and Relatives (VFR)

Immigration flow by region

Source: UN WTO, UN DESA, Airbus
International students have taken advantages of increased mobility

Number of international students and share of World Population

Source: OECD, UN Population Division, Airbus
Air transport growth is highest in expanding regions

Emerging/Developing
- China
- India
- Middle East
- Asia
- Africa
- CIS
- Latin America
- Eastern Europe

Yearly RPK growth 2014 - 2033
- 6.2 billion people 2014
- +6.0%

Advanced
- Western Europe
- North America
- Japan

- 1 billion people 2014
- +4.2%

Billions of people will increasingly want to travel by air
Air traffic will double in the next 15 years

Source: ICAO, Airbus GMF 2014

World annual RPK* (trillion)
But we will face higher expectations and more competition
Future of Air Transport through uncertainties

- Economy
- Politics
- Air Transport
- Environment
- Energy
Air Transport Scenario

2030 Global Scenarios Factors

- **ECONOMICS**
  - GDP Growth
  - Income Distribution between Countries
  - Middle Class Development
  - World Trade & Financial Stability
  - Tourism Development

- **ENVIRONMENT**
  - Ecological & Climate Change
  - Environmental Awareness & Environment Policy

- **SOCIETY**
  - Migration
  - Safety & Security Awareness
  - Urbanisation
  - Demographics

- **TECHNOLOGY**
  - Technology impact & Competition

- **GEOPOLITICS**
  - World Stability & Security
  - Globalisation & Regionalisation
  - Emerging Superpowers

- **ENERGY**
  - Availability & Access
  - Energy Prices
  - Renewable Share

2030 Air Transport Scenarios Factors

- **TRAFFIC**
  - Passenger Traffic
  - Cargo Traffic
  - Jet Li Price
  - Ground Transport
  - Competition
  - Impact of IAI

- **ENVIRONMENT**
  - Acceptance of Air Traffic
  - Noise & Emissions
  - Local Restrictions
  - Emissions Cap & Trade

- **AIRCRAFT OEM’s**
  - Technology Impact
  - Competition

- **POLITICS & INFRASTRUCTURE**
  - Air Transport Support
  - Commercialisation / Liberalisation
  - Air Traffic Prices & Taxation
  - Airport Infrastructure
  - ATM Infrastructure

- **AIRLINES**
  - Financing Attractiveness
  - Business Models
  - Unit Revenue
  - Network Development

2030 Scenarios Summary

- **Scenario**
- **Mega Blocs**
- **Scared & Selfish**
- **Turning Green**

- **ECONOMICS**
  - Economic development
  - Tourism Growth
  - Political stability
  - Globalisation
  - Value/Behaviour

- **ENVIRONMENT**
  - 2030 Share of renewable energy
  - Environment awareness

- **TECHNOLOGY**
  - Technology impact

- **POLITICS & INFRASTRUCTURE**
  - Air Transport Infrastructure

- **AIRLINES**
  - Technology impact

- **AIRBUST**
  - Airbus

Today 2030

Scared & Selfish

Mega Blocs

Turning Green
THE OUTLOOK TO 2040

Factors likely to drive change in the world economy

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Multiple factors influence long term developments

- Demographic trends
  - Demographic growth, changing age pyramids, urbanisation, …
- Underlying structural trends, and the legacy of the past
  - In economic terms: sectoral composition of output, industrial organisation (clusters, large/small, gazelles…), income distribution, **wealth distribution**, …
  - How “resources” are preserved: education levels, …
  - Regulatory structure: democracy, rule of law
- Technological progress, and the diffusion of innovation
- Changing face of finance
- What people will do / how they will behave – ie attitudes, values and strategies
  - Can vary across countries / role of culture
Four families of stakeholders will influence tomorrow’s future

- Households
- Non-financial organisations
- Financial organisations
- Governments
The future will be defined by the interactions between these stakeholders and their environment.

- Households
- Financial organisations
- Non-financial organisations
- Societal
- Social
- Economy
- Environment
- Governments
Progress is measured on several dimensions. The economic dimension is only one of them...

- Economic
  - Wealth
  - Income generation
- Environment
  - Pollution
  - Preservation of resources
- Social
  - Equity, accessibility
  - Quality of life
- Societal
  - Life expectancy
  - Health
  - Education
Driving factors on the demographic front include

- Changing age pyramids

- Urbanisation patterns / hence increased risks from a security/health standpoint, and changed infrastructure needs?
Demographic structures

1970

2014

2040

Million

- 80+
- 65-80
- 14-65
- <14

Advanced Economies
Emerging Economies
Advanced Economies
Emerging Economies
Advanced Economies
Emerging Economies
Household’s behaviours/values will change

- Generational shifts

- Income (re-)distribution

- Attitudes / consequences of technological change and impact on behaviours and preferences

- Risk and perception of risk
Globalisation is likely to take new forms

- **18-19th centuries**: Localised production
- **1900-30**: Fordism
- **1940-80**: Trade liberalisation
- **1990-2005**: ICT Revolution
- **2005-14**: Mass customisation Clusters

**1** Global sourcing to mitigate risks
**2** Regional integration Protectionism
**3** Intangibles & Shift in consumer values
**4** Return to localised prod systems
Technological progress will contribute to the change in globalisation patterns. A new revolution is in the making.
In past decades, trade has been an engine of world growth

World - Total Export vs Real GDP growth - in yoy, %
It will continue to play a role in the future, but more limited

World - Total Export vs Real GDP growth - in yoy, %

- Total exports of goods and services
- GDP Real
The share of exports in world GDP will stabilise

World : Ratio Total exports to GDP (in %)
The trend in FDI is another sign of the globalisation. Its future trend illustrates the changing form of globalisation.
FDI growth will resume, but should not reach the pre-crisis peak
Financial market developments have largely contributed to global growth

Ratio of equity market capitalization to GDP for key markets
Productivity will be the main driver of growth in the advanced economies

**Advanced Economies**

**History (1997-2012)**
- TFP: 43.8%
- Capital: 54.3%
- ENEII: -1.6%
- Labor: 3.5%

**Forecast (2013-2040)**
- TFP: 60.9%
- Capital: 37.3%
- ENEII: -1.1%
- Labor: 2.9%

**Major Emerging Markets**

**History (1997-2012)**
- TFP: 27.1%
- Capital: 52.7%
- ENEII: 7.4%
- Labor: 12.8%

**Forecast (2013-2040)**
- TFP: 36.3%
- Capital: 53.8%
- ENEII: 4.4%
- Labor: 5.5%
These factors explain the different speed of growth across regions

Real GDP growth, %

- Africa
- Asia-Pacific
- Central America
- South America
- NAFTA
- Europe
- EMU
- Middle East & North Africa

1994-2014
2014-2040
By 2040, 85% of the world’s economies will still have a real GDP per capita level below that of the US in 2000.

Real GDP per capita in 2040 as a share of US real GDP per capita in 2000.
Number of countries with a real GDP per capita in 2040 below x% of the US real GDP per capita in 2000
10 poorest and 10 wealthiest countries by 2040

• Somalia
• Guinea-Bissau
• Burundi
• Niger
• Madagascar
• Eritrea
• Democratic Republic of Congo
• Liberia
• Togo
• Central African Republic

• Lichtenstein
• Qatar
• Macau
• Luxemburg
• Bermuda
• Norway
• Singapore
• Switzerland
• Australia
• United States
Risks of social disruptions abound …

One-year outlook for social/labour unrest
Trend in the share of different countries/regions in real world GDP in selected years
The Asia-Pacific region will account for half of the growth in world GDP in 2040.
Conclusion

• Globalisation will take new forms going forward
  • Increased intra-regional focus
  • Focus on intangibles/value of services
  • Impact of manufacturing 4.0 on the location of production
  • Global sourcing to mitigate risks

• The Asia-Pacific region will continue to drive world growth

• Global world imbalances will persist: 85% of the world’s economies will still have a real GDP per capita level below that of the US in 2000: social disruptions could change the outlook

• Technological progress, geopolitical factors and demography will have at least as big a contribution as underlying economic developments going forward
Thank you!

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