GLOBAL BUILT ASSET WEALTH INDEX

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Why a Built Asset Wealth Index?

- 2015 GBAWI assesses development of a nation's built environment
  - To show which countries are creating long-term sustainable foundations for economic, social and environmental success
  - Quantify value of built assets in 32 countries
  - Consider all buildings and infrastructure
- In current uncertain environment decision makers need a deep understanding of infrastructure investment and its relationship to economic growth
  - Arcadis is helping stakeholders in public and private sectors tackle infrastructure challenges to improve quality of life
  - GBAWI provides lessons learned from both emerging and developed markets and insights for future investment

Key findings

China overtakes the USA in built asset value, as emerging markets invest rapidly

- Emerging economies are investing heavily in built assets and are expected to continue
  - They will need a renewed focus on quality over quantity
- Developed economies see stagnation or decline of built asset stock
  - Strategic investment is essential as well as a whole life cycle approach
- Urban environments will be the focus of much of the growth in built assets
  - Investing in sustainability of cities where there are weaknesses in people/planet/profit is a route to growth

GBAWI estimates the value of built assets in 32 countries representing 87% global GDP

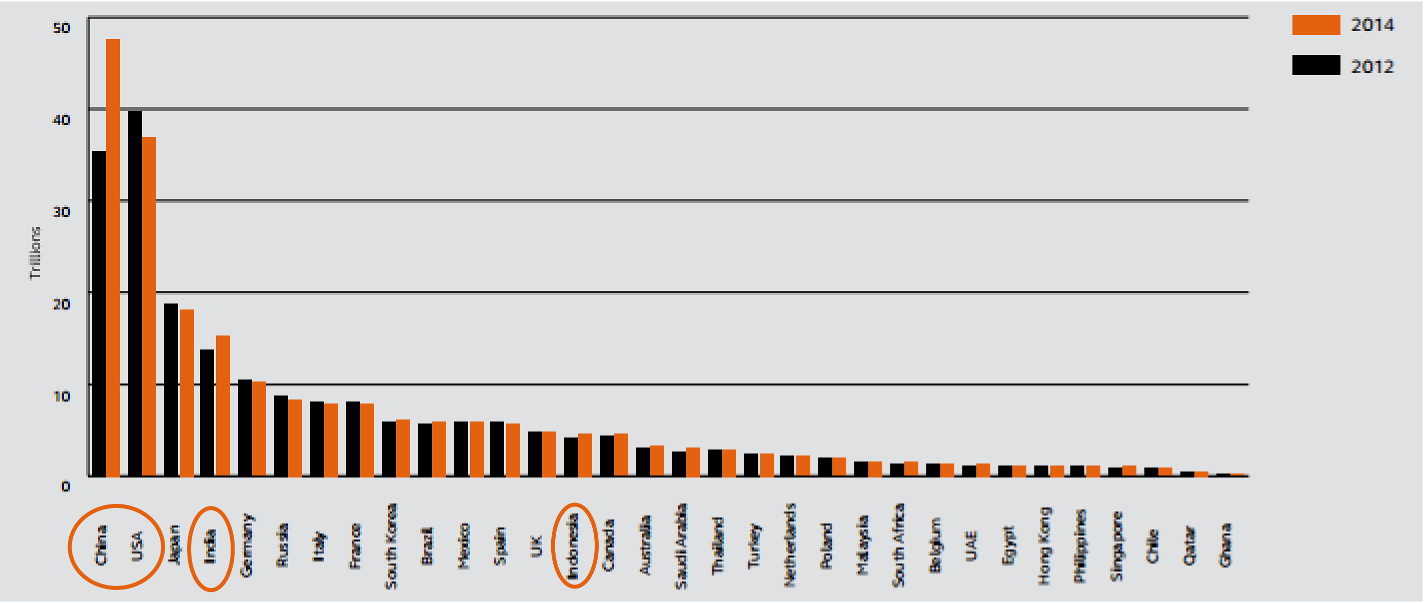
Total built asset wealth is estimated at US$30,700 per person alive today

Threat of depreciation for advanced economies if they do not invest strategically

China investing while the US depreciates

Though investment continues to rise, especially in emerging markets, advanced economies see de-investment on an unprecedented scale

Figure 1: Built Asset Wealth value (US$) per country, 2012 vs 2014

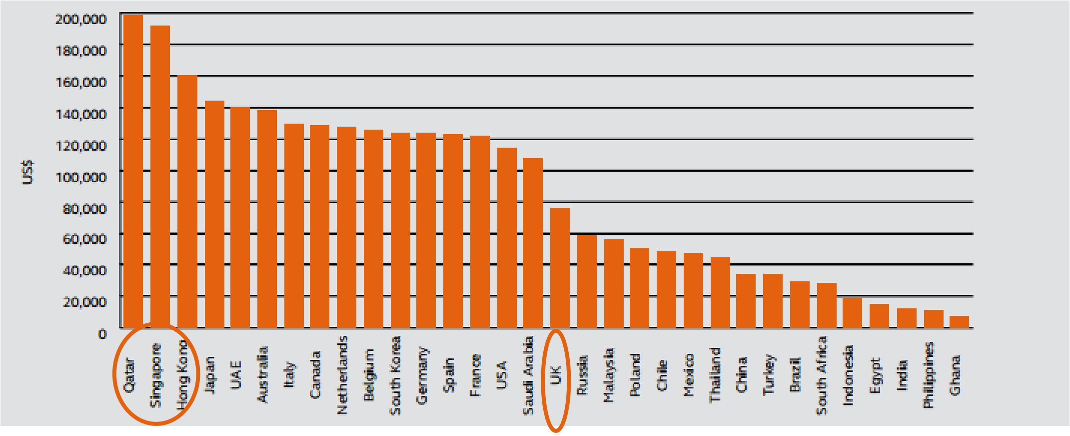


A clear and transparent infrastructure investment plan would allow countries to be more strategic about their built assets

$198,000 built assets per capita in Qatar

Smaller, emerging markets lead in per capita income, with larger, developed economies lagging

Figure 2: Built Asset Wealth value per capita 2014



- Qatar and Singapore are comfortably ahead as smaller countries investing heavily
- UK is far behind other advanced economies
  - Built assets are very productive
  - Investment will go further

Given the productivity of the UK's asset base, there is a strong case for investment in infrastructure in the UK

Net depreciations in developed markets

Emerging markets see significant investment in absolute and relative terms, whilst biggest developed economies see depreciation in stock

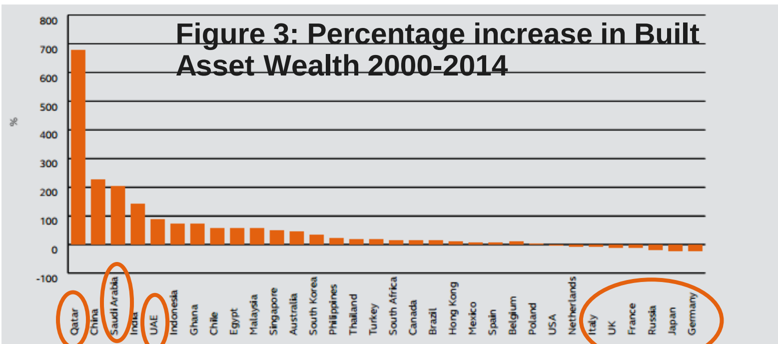


Figure 3: Percentage increase in Built Asset Wealth 2000-2014

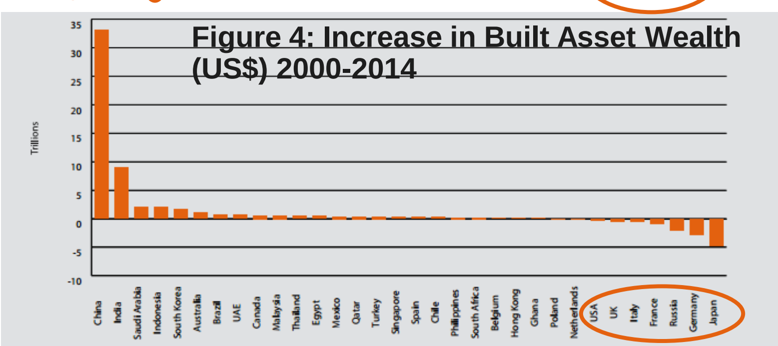


Figure 4: Increase in Built Asset Wealth (US$) 2000-2014

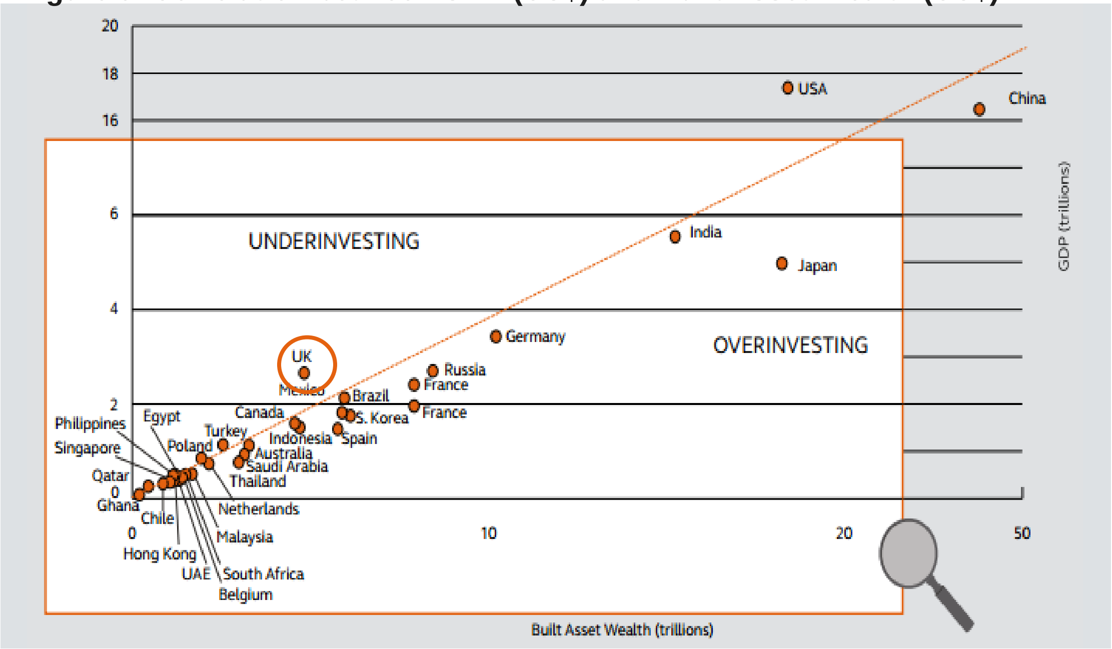
- Most advanced nations underinvested between 2012 and 2014
  - Chronic underinvestment followed by financial crisis and recession in Europe leads to net depreciation
- Spain largest proportional decline 3.8%of GDP 2012-2014
- Japan largest absolute decline of $590bn 2012-2014
- Three OPEC members in the top 5 investors
  - Used resource revenues to make steps towards diversification of economies
- Qatar highest proportional growth between 2000-2014, at nearly 700%

Advanced economies could become less able to service their populations needs, but funding improvement may not be feasible

Strong built assets for a strong GDP

Built asset wealth is highly correlated to a larger GDP, but substantial differences between economies

Figure 5: Correlation between GDP (US$) and Built Asset Wealth (US$)



China is very capital intensive, and overinvesting in terms of GDP, but not per capita

US + UK is highly service oriented and so appears under-capitalised: could this show an opportunity to invest?

UK stands to make significant gains to GDP through investment, given current underinvestment and productive asset base

The UK is grasping the opportunity to invest in its productive assets

Strong case for investment in UK

- UK behind all other G7 members on built asset per capita
  - However, built assets are very productive
- Strong correlation with GDP suggests opportunity for further growth through investing
- Reflected in forward spending program on infrastructure
  - £150bn investment next 5-8 years in transport and utility
  - Further £150bn in infrastructure 'mega programmes' eg TTT, HS2
- Increased transparency and continued masterplanning is key

Huge infrastructure spend in Qatar

- Built asset wealth per person is up by over $50,000 since 2013
  - Fastest growing construction industry in the GCC at 18% per year
- Big pipeline of large investments in infrastructure
  - 2022 Fifa World Cup $4.83bn
  - 2030 National Vision: $150bn next decade
    - $20bn on roads
    - $40bn railways
    - $40bn stadiums
    - $8bn ports

Both economies are making required investments in infrastructure: Qatar needs to ensure whole lifecycle costs have been considered

China to move further ahead

By 2025 China's total asset stock will be more than double that of the US, and many emerging economies will overtake developed ones, for example India overtaking Japan, and Thailand surpassing Australia, Poland, Turkey

Figure 6: 2025 Built Asset Wealth forecast (US$)

China's continued investment will facilitate growth of other emerging economies, contributing to a shift in global economic power

UK leveraging productive built assets

Lessons from emerging economies

- Create a clear investment framework
  - Many of the nations that are investing in their built environment have set in place a framework to attract investment to help fund it
  - Advanced economies facing a depreciating asset base could take on board these strategies

UK

- Above average productivity of assets (according to Arcadis Global Built Asset Performance Index 2014) in the UK indicates that investment in infrastructure is very worthwhile
- Masterplanning at a city level is increasing, aligning built asset enablers for education, healthcare, transport, retail as well as affordable housing
  - National Infrastructure Plan: overall infrastructure pipeline £466bn (£277bn in construction, future investment £189bn) with up to £52bn of potential project finance opportunities offered to investors
  - Bundling asset classes into city programmes makes scale of asset investment opportunity more attractive to investors, creating new funding opportunities
  - Collaboration between combined Local Authorities and the private sector also derisks the programmes and increases potential for revenue generation

The UK is already adopting many of the strategies recommended, including masterplanning and transparent investment programmes

Planning for whole lifecycle will support emerging markets' continued investment

- Outside of developed economies, the post-2000 period saw high levels of asset creation
- China's investment has been crucial to many other countries
  - Boom in construction supported high commodity prices enabling commodity exporting economies such as Qatar, Canada, Indonesia, Saudi Arabia, Chile and Australia to enjoy high revenues and hence make large investments themselves

Lessons to learn from the advanced economies

- Consider the whole lifecycle cost of assets
  - Many European countries have had to master the art of maintaining existing assets to retain value long after they should have become redundant
    - Eg London's Victorian age sewage system is still being used nearly 150 years after it was constructed
  - Key is a robust asset management strategy that prioritises spend to maintain, not just build the assets
  - One way to source the maintenance funding is through devolving financial responsibility away from central government to the end user, or local tax payer

Emerging economies need to forecast maintenance and other infrastructure costs, as well as initial investment

Urban environments will be focus for investment in most advanced economies

- Cities represent 54% of global population, 70-80% of economic output, and 80% of energy consumption and will be the main focus of built asset investment over the next decade
- Sustainable investment is essential to ensure a higher quality of life for the people, greater profits and less harm to the environment for the plant
- Habitat III conference in 2016 will provide further structure to the urban agenda: countries can look to invest optimally to maximise the benefit of built asset investments
- The Sustainable Cities Index considers 50 world cities from 31 countries around the world, highlighting strengths and weaknesses across these three categories
  - Provides a platform for public and private decision-makers in highlighting areas of success and need for further investment to improve

Cities should focus investment where their relative weaknesses lie

- Way in which cities are planned, built, operated and redefined has a huge social, environmental and economic impact

- Countries need to find ways to balance the demands of generating strong financial returns when investing in their cities, maintaining them an attractive place to live and work in, and limiting their damage to the environment

- Across the world, cities are performing better at satisfying the profit and planet needs, but insufficient investment is being made in their people

- Many advanced economies have cities which are becoming less affordable for their citizens, with the cost of property in London, New York, Paris, Tokyo and Hong Kong penalising the people ranking

- The trade of between people and planet is most starkly seen in the Middle East, with cities like Dubai and Doha having invested in profit often at the expense of planet.

Advanced economies need to invest in their people, whilst emerging economies need to retain focus on profits, and invest in planet

Targeted investment needed in London and Doha

London

Overall Rank Sustainable Cities Index		2nd
People rank	**Planet rank**	**Profit rank**
3	12	2

- One of the top cities in the world, but a victim of its own success
- Underinvestment in infrastructure meant London was failing to meet the needs of its people
- But significant infrastructure investments being made to address this, including Crossrail (1 and 2) and Thames Tideway Tunnel
- Housing still a significant challenge; although increasing still far short of 49,000 units a year needed

Doha

Overall Rank Sustainable Cities Index		41st
People rank	**Planet rank**	**Profit rank**
34	50	30

- Up and coming city expected to rise rapidly through the rankings
- Qatar National Vision 2030 outlines framework for investment around environmental, human, social and economic development pillars
- Highest per capita income and per capita carbon emissions: much to be done for Planet needs
- Mission to cut CO2 emissions, improve energy efficiency, minimise water use through green buildings and invest in renewable energy solutions
- But change to behaviour also needed

Continued investment for growth, with differing priorities

- Countries globally would benefit from investment in built assets, but the focus of investment needs to reflect the particular needs of the country and its urban environments
- A focus on urban environments, due to the economic, social and environmental importance of cities, is essential
- Investing in areas of highest need will ensure maximum value for money
  - For advanced economies, investment in people through transport, housing and public space infrastructure
  - For developing economies, investment into building profits, whilst limiting environmental damage of built assets
- Essential to consider whole lifecycle cost of assets, as well as building a framework, with consideration to what is realistically investable and deliverable
  - Leveraging private sector finance through a transparent forward looking plan making clear where investment opportunities lie
  - Bear in mind resource constraints: challenges around skills shortages in the UK and globally