Asia Infrastructure Boom and Insurance Outlook

Clarence Wong, 22 August 2019
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- Infrastructure financing
- Insurance implications
- Conclusion
Executive Summary

• Asia is experiencing a boom in infrastructure investment
  – The region is the biggest recipient of infrastructure investment with the fastest growth rate over the world ...
  – ... but this is still not sufficient to close the region’s infrastructure gap
  – BRI will help, to a limited extent

• We need more infrastructure investment
  – A key constraint is financing
  – One option is to shift from public funding to PPP + Infrastructure Investment Platforms (IIP), in order to better tap private capital

• Infrastructure is changing: More focus on green, ESG and resilient infrastructure

• What this means for insurance, on both sides of the balance sheet
  – Insurance can help to lower the financial burden arising from the risks associated with infrastructure
  – Insurance industry can also play the role of investors in infrastructure
Economic Backdrop
Slowing growth, low inflation, low policy rates

70% of key markets show contraction in manufacturing

Weakness in Autos, Industrial goods and Electronics

Asia in better shape than any other regions

Source: IHS Markit, HSBC
Top risks for 2019

- **Trade war**: 35%
- **US recession**: 35% =
- **Central Bank policy error**: 20% =

2020 cyclical themes:
- Business cycle (the R-word)
- Policy mix (monetary, fiscal)
- New World Trade Order
- Geopolitics (US, China, etc.)
- Macro and markets
- Global debt burden

Longer-term themes:
- Demographics
- Inequality and Vox Populi
- Rise of technology
- Climate change
Implications for infrastructure

Fiscal leverage
More reliance on fiscal (incl. public infra spending) than monetary policy

Low funding cost
Continuous low interest rates and saving glut

Impact on BRI

Weakening growth and rising uncertainties
Unwillingness to commit to long-term investments

Re-ordering of global trade and investment
Ongoing changes to the global supply chain

Source: IHS Markit
Infrastructure Boom
Asia leads the growth globally in infrastructure
A gap remains despite accelerating infrastructure investment

Comparison of estimates of infrastructure investment needs by various leading studies, USD bn

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2016-2030</td>
<td>2016-2040</td>
<td>2017-2035</td>
</tr>
<tr>
<td>Total Asia-Pacific</td>
<td>22,551</td>
<td>52,673</td>
<td>37,476</td>
</tr>
<tr>
<td>Cumulative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual average</td>
<td>1,503</td>
<td>2,107</td>
<td>1,972</td>
</tr>
</tbody>
</table>

OEF Breakup: Global investment requirements by region, 2016-2040 (cumulative)

Source: Global infrastructure outlook, global infrastructure hub, 2017, Oxford Economics
Mix of infrastructure investment

Asia sectoral pattern of infrastructure investment, 2007-2040

- Electricity
- Road
- Telecoms
- Rail
- Water
- Port
- Airport

Source: Global infrastructure outlook, Global Infrastructure Hub, 2017; Oxford Economics
Focus on green infrastructure is increasing

Distribution of installed power generation capacity in China

- Renewable
  - Hydro: 58%
  - Wind: 20%
  - Solar: 9%
  - Bioenergy: 1%

- Non-renewable
  - Coal: 32%
  - Gas: 7%
  - Nuclear: 4%
  - Oil: 15%

The B&R Initiative involves huge investments in infrastructure and support economic growth

B&R-related investments by type of project by 2030

<table>
<thead>
<tr>
<th>Types of project</th>
<th>Aggregate project value (USD billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>China</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>649</td>
</tr>
<tr>
<td>Telecommunication</td>
<td>203</td>
</tr>
<tr>
<td>Water and sanitation</td>
<td>241</td>
</tr>
<tr>
<td>Power and resources</td>
<td>662</td>
</tr>
<tr>
<td>Other infrastructure</td>
<td>259</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
</tr>
<tr>
<td>Agriculture, forestry, animal husbandry and fisheries</td>
<td>31</td>
</tr>
<tr>
<td><strong>Cultural exchange, tourism</strong></td>
<td></td>
</tr>
<tr>
<td>Cultural exchange, tourism</td>
<td>69</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
</tr>
<tr>
<td>Capacity cooperation</td>
<td>39</td>
</tr>
<tr>
<td>Industrial parks</td>
<td>101</td>
</tr>
<tr>
<td>Commercial building</td>
<td>85</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2339</td>
</tr>
</tbody>
</table>

Note: Numbers for “China” represent values for projects located in China, and numbers for “Overseas” are for those projects outside of China. If a project spans China and other countries (e.g., bridges and railroads across borders), an estimated portion is applied to “China” and the rest to “Overseas.”

Source: China’s Belt & Road Initiative: the impact on commercial insurance in participating regions, 2017, Swiss Re
ASEAN also faces huge investment gap and needs investments of >100 bn over next 10-15 years. BRI may partly bridge but not resolve the gap.

### Various third party estimates of annual infrastructure investment needs in ASEAN, USD bn

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Estimates of annual investment needed</strong></td>
<td>60</td>
<td>200 (2013 prices)</td>
<td>146</td>
<td>100</td>
<td>110</td>
</tr>
<tr>
<td><strong>Sectors covered</strong></td>
<td>Power, transport, telecommunication, WSS</td>
<td>Power, transport, telecommunication, WSS</td>
<td>--</td>
<td>Power, transport, telecommunication, WSS</td>
<td>Power, transport, telecommunication, WSS</td>
</tr>
<tr>
<td><strong>Countries covered</strong></td>
<td>All, except Brunei Darussalam, Singapore</td>
<td>All ASEAN members</td>
<td>All, except Brunei Darussalam, Singapore</td>
<td>All, except Brunei Darussalam, Singapore</td>
<td>All ASEAN members</td>
</tr>
</tbody>
</table>

Note: WSS = Water Supply and Sanitation

- Although public spending has increased in ASEAN countries, it will not be sufficient. Going forward, the amount of investment needed will be in multiples of current spending.
- Indonesia has the biggest financing need, followed by Philippines, Thailand and Malaysia. In terms of the sector, the largest infrastructure needs will be in transport and power sectors.

Source: UNCTAD ASEAN investment report 2015, McKinsey Global Institute, Citi Research
Infrastructure financing
Stages of infrastructure financing

Phase 1
- Largely financed by public sector
- High cost
- Poor maintenance
- Corruption
- Little positive externalities

Phase 2
- Wave of privatisation
- PPP
- FDI
- NGO
- Corporate finance

Phase 3
- Innovative institutions
- New platforms
- Infrastructure bonds/securities
- SPVs
Financing infrastructure investment

➢ The infrastructure investment in Asia is largely funded by public sector which accounts for more than 90% of the total infrastructure spending in the region.

➢ The contribution of Multilateral Development Banks (MDBs), most of which provide support for public sector finance, accounts for only a small portion of the infrastructure spending (around 2.5% of the region’s infrastructure investments in 2015).

➢ Meanwhile private participation in infrastructure investment is increasing over the years, especially in telecommunications and power generation.

➢ The Public Private Partnership has gained attention over the past three decades

Source: Meeting Asia infrastructure needs_ADB_2017
Syndicated loans for infrastructure and corporate infrastructure bonds has increased in recent years.

**Syndicated loan for infrastructure**

- **USD bn**
- **05** to **15**
- **China**
- **India**
- **NIEs**
- **ASEAN-5**

**Corporate infrastructure bonds**

- **USD bn**
- **00** to **14**
- **China**
- **Korea**
- **Malaysia**
- **India**
- **Taiwan**
- **Hong Kong**
- **Other*”

Note: NIEs are Hong Kong, Singapore, South Korea and Taiwan

Note: *Thailand, Philippines, Indonesia, Singapore and Vietnam

Sources: Dealogic, Deutsche Bank Research
Institutional investors think pension funds as most suitable for insurance investment

Which sources of financial investment do you see as most suitable for Asia-Pacific infrastructure in 2019?

- Pension funds: 70%
- Investment funds: 64%
- Equity investment: 39%
- International commercial banks: 34%
- Local commercial banks: 27%
  - Development financial institution support: 24%
  - Sovereign wealth funds: 14%
  - Bonds: 12%
  - Blended finance: 8%
  - Export credit agencies: 8%

Source: Cutting through the noise: Infrastructure in Asia-Pacific 2019, White & Case, 2019
MDBs are focusing on building resilience, especially related to climate change and disasters.

ADB has been at the forefront of infrastructure resilience to weather related disasters and future climate change, sometimes termed climate proofing. It has committed USD 80 bn for climate finance between 2019-2030.

- Majority of climate financing goes to infrastructure, especially energy, transport and urban infrastructure.
- The investment in adaptation is to ensure that infrastructure projects are designed to reduce or minimize potential climate impacts.

Source: ADB climate finance database, Swiss Re Institute
Insurance Implications
Infrastructure projects are exposed to various risks. In general, risk is high during construction phase and gets lower during operational phase.

Risk exposure of infrastructure projects by risk and project type

<table>
<thead>
<tr>
<th>Project/Risks</th>
<th>Transportation projects</th>
<th>Power and energy projects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Roads</td>
<td>Bridges</td>
</tr>
<tr>
<td>Fire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explosion</td>
<td></td>
<td></td>
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<tr>
<td>Subsidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storm (Wind)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earthquake</td>
<td></td>
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<tr>
<td>Lightning</td>
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<tr>
<td>Terrorism</td>
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<tr>
<td>Theft</td>
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<tr>
<td>Third Party Liability</td>
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<tr>
<td>Political Risk</td>
<td></td>
<td></td>
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<tr>
<td>Employer’s Liability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All Nat Cat risks (EQ, Flood, Storm) depend on location. This heat map is based on the assessment by internal experts within Swiss Re.
Developed markets are less risky compared to emerging markets in terms of riskiness on the infrastructure industry in Asia.

Source: China Infrastructure Report, Fitch Solutions, Q4 2018
The infrastructure industry in emerging markets present high risk but also high rewards.
How re/insurance can support infrastructure growth: stylised timeline of engineering insurance

Note: Abbreviations refer to types of insurance policies. BI = Business Interruption, TPL = Third-party Liability, CAR = Contractors’ All Risks, EAR = Erection All Risks, ALoP = Advance Loss or Profits, DSU = Delay in Start-up, MB = Machine Breakdown, MLoP = Machinery Loss of Profits and DoS = Deterioration of Stock, CPE/CPM = Contractors’ Plant, Equipment and Machinery, IDI = Inherent Defects Insurance. The maintenance period refers to the period after practical completion of a contract during which a contractor is obligated to repair any defects in workmanship and materials.

Source: sigma2_2018_Constructing the future_recent developments in engineering sigma
BRI activities in China can generate total commercial premium of USD 23 bn during 2015 - 2030

Commercial premiums for China’s insurers generated by B&R, by line of business

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<tr>
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<tbody>
<tr>
<td><strong>Construction-related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>2.2</td>
<td>8.2</td>
<td>–</td>
<td>10.4</td>
</tr>
<tr>
<td>Property</td>
<td>2.5</td>
<td>5.1</td>
<td>–</td>
<td>7.6</td>
</tr>
<tr>
<td>Marine*</td>
<td>0.7</td>
<td>2.5</td>
<td>–</td>
<td>3.2</td>
</tr>
<tr>
<td>Liability/PA**</td>
<td>0.1</td>
<td>0.2</td>
<td>–</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>5.5</strong></td>
<td><strong>16.0</strong></td>
<td>–</td>
<td><strong>21.5</strong></td>
</tr>
<tr>
<td><strong>Trade-related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marine (general cargo)</td>
<td>–</td>
<td>–</td>
<td><strong>0.9</strong></td>
<td><strong>0.9</strong></td>
</tr>
<tr>
<td>Trade credit</td>
<td>–</td>
<td>–</td>
<td><strong>0.6</strong></td>
<td><strong>0.6</strong></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>–</td>
<td>–</td>
<td><strong>1.5</strong></td>
<td><strong>1.5</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5.5</strong></td>
<td><strong>16.0</strong></td>
<td><strong>1.5</strong></td>
<td><strong>23.0</strong></td>
</tr>
</tbody>
</table>

Note: *Construction-related marine insurance includes project cargo and cover for delayed start-up. **Liability/PA includes single project professional indemnity, product liability and employer liability/PA. Personal accident can be purchased in lieu of employer’s liability, and vice versa.
Current investment trend can generate cumulative commercial insurance premium of USD 126.4bn/USD 5.1bn per annum during 2016-40

<table>
<thead>
<tr>
<th></th>
<th>Cumulative premiums (2016-40) based on the current investment trend</th>
<th>Premiums per annum (2016-40) based on the current investment trend</th>
<th>Cumulative premiums (2016-40) based on investment needed</th>
<th>Premiums per annum (2016-40) based on the investment needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>92.3</td>
<td>3.7</td>
<td>101.6</td>
<td>4.1</td>
</tr>
<tr>
<td>Transportation</td>
<td>47.9</td>
<td>1.9</td>
<td>50.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Energy</td>
<td>30.3</td>
<td>1.2</td>
<td>34.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Other</td>
<td>14.1</td>
<td>0.6</td>
<td>16.3</td>
<td>0.7</td>
</tr>
<tr>
<td>Marine*</td>
<td>30.5</td>
<td>1.2</td>
<td>33.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Liability/PA**</td>
<td>3.6</td>
<td>0.1</td>
<td>3.9</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>126.4</strong></td>
<td><strong>5.1</strong></td>
<td><strong>139.0</strong></td>
<td><strong>5.6</strong></td>
</tr>
</tbody>
</table>

Note: *Construction-related marine insurance includes project cargo and cover for delayed start-up. **Liability/PA includes single project professional indemnity, product liability and employer liability/PA. Personal accident can be purchased in lieu of employer’s liability, and vice versa.

Source: Swiss Re Institute, based on data from EOF, GIH
Conclusions
Economic uncertainty reducing willingness to commit to long-term investments

A large infra gap remains and need private capital

Insurance industry can help both to finance the infrastructure as well as to lower the financial burden arising from the risks associated with infrastructure
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