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Techniques for Evaluation of Infrastructure Projects

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Techniques for Evaluation of Infrastructure Projects

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Best Practices on Public Investment Systems (EC 08 2018A)

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Conceptual Framework

- Different methodological approaches
  - Net Present Value
  - Multicriteria Analysis
  - Infrastructure and equality
  - Hedonic Prices
  - Gender (Composition of technical teams)

Institutional setting and methodological approaches

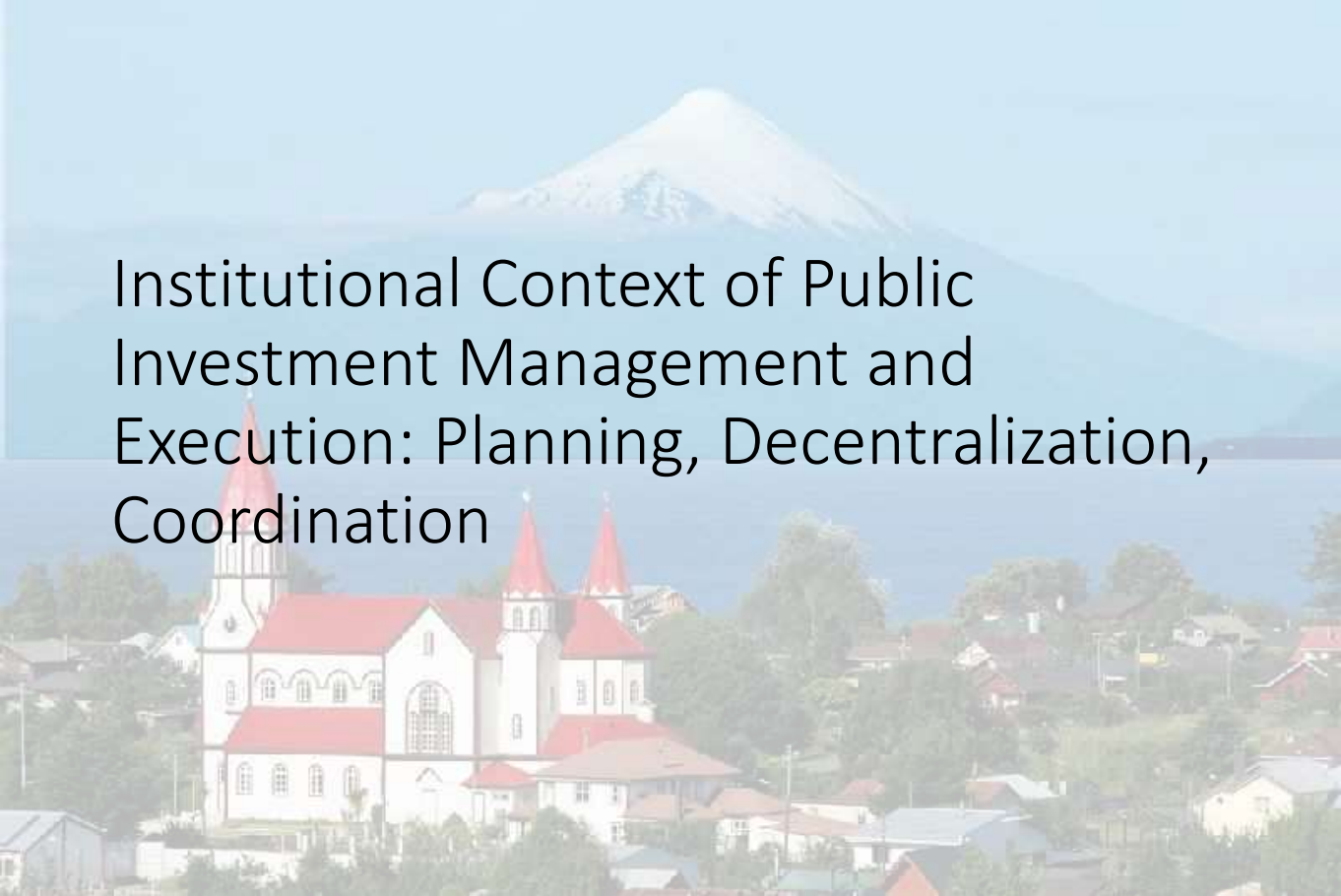
- Fiscal Federalism and decentralized investment in USA
- Central government level decision making with technical rigor: The Latin American experience
- The role of minimal standards in analyzing investments

Review of literature on institutions and public investment

- The role of government
- Investment in a decentralized government structure
- Barry Weingast's "Tragic Brilliance"
- Strengthening fiscal pillars of local governance
- Planning as a coordinating tool among different levels of government and sectors.

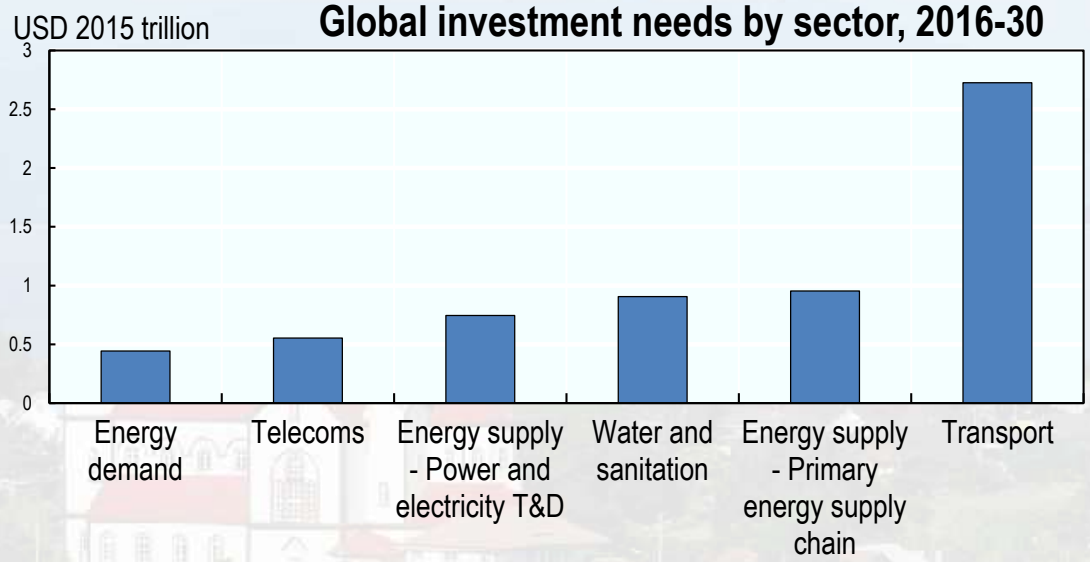
Decentralization and Territorial Comparative Advantage

- Each level of government has a set of spending and investing responsibilities.
- Planning or coordination or both?
- Economy-wide vision with local complementarities
- Gap Analysis at the central level
- Gap analysis at the regional and local levels
- Who funds what type of infrastructure?
- The role of APP's



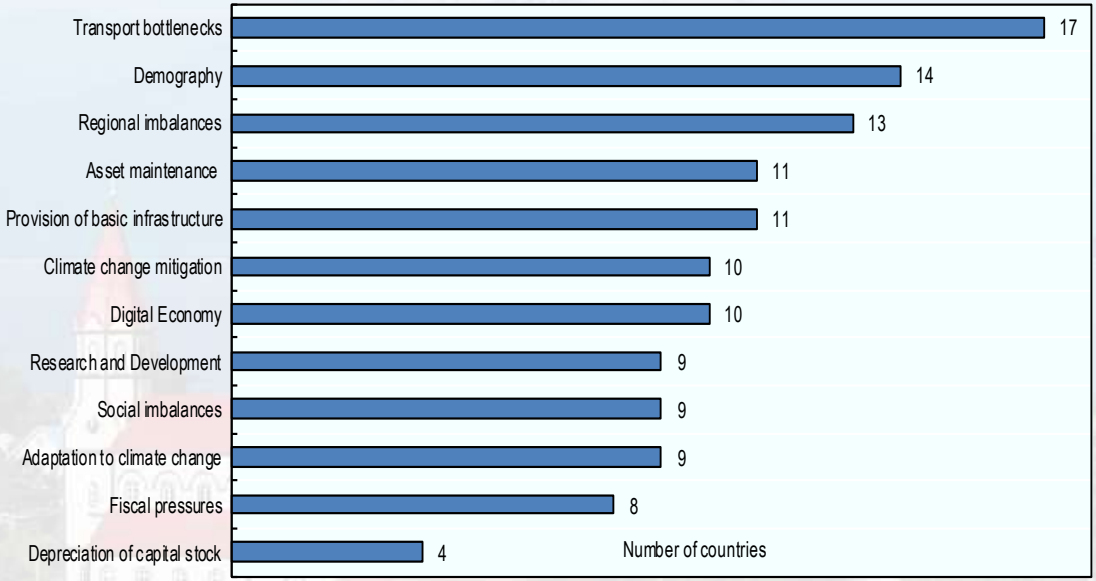
Institutional Context of Public Investment Management and Execution: Planning, Decentralization, Coordination

Infrastructure gaps are not being resolved



Source: OECD (2017), *Investing in Climate, Investing in Growth*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264273528-en,

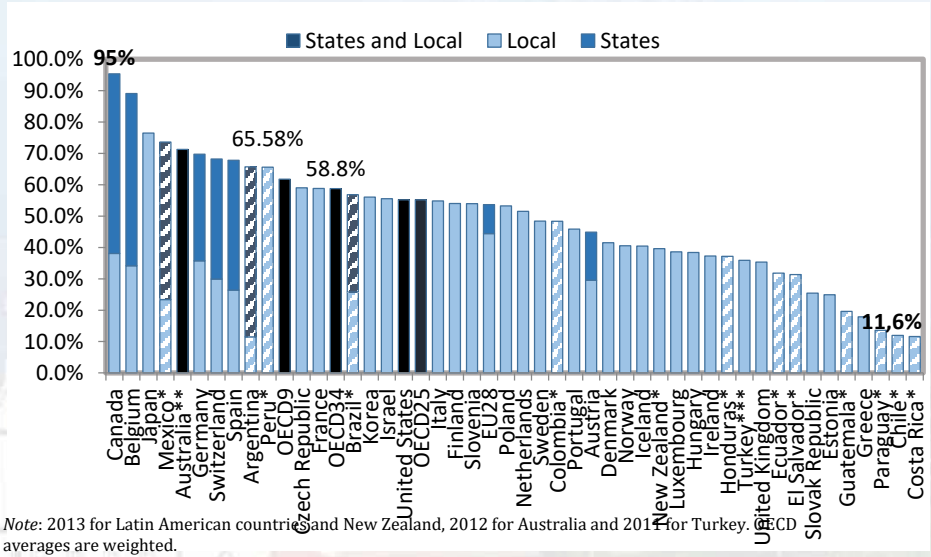
Closing infrastructure gaps drive infrastructure plans



Source: OECD (2018), Survey on Capital Budgeting and Infrastructure Governance

Public Investment is a Shared responsibility among different levels of government: The role of decentralization

Subnational Public Investment in OECD and LAC countries



Note: 2013 for Latin American countries and New Zealand, 2012 for Australia and 2011 for Turkey. OECD averages are weighted.

Source: Based on OECD (2016) and "Subnational Government Structure and Finance", OECD Regional Statistics (database), http://dx.doi.org/10.1787/05fb4b56-en. and OECD/UCLG (2016) http://www.oecd.org/regional/regional-policy/sngs-around-the-world.htm .

Examples

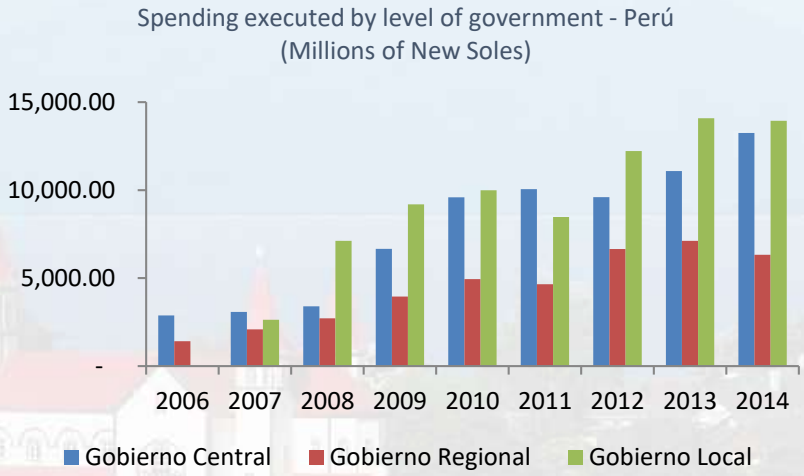
Application of new management practices and tools to Peru: From SNIP to Invierte.pe

Why the Reform?

- Economic and institutional reasons behind the reform
- The need to manage the investment cycle
- The need to strengthen coordination between investment office and budgeting
- The need to strengthen management, technical, and information gaps at the local level
- The role of technology

Growth of public investment in Peru prior to the reform

The role of local governments in preparing and executing public investment increased between 2006 - 2014.

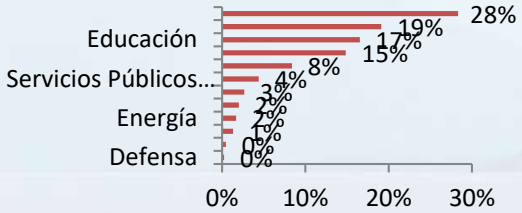


Fuente: Cálculos propios FMM.

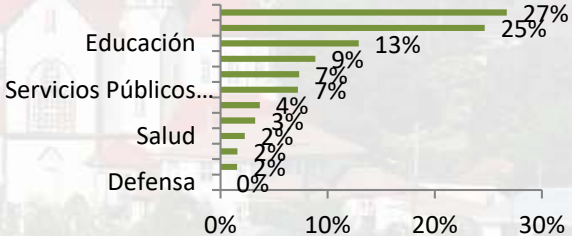
¿How did Peru invest in 2014?

Central Government

Regional Governments



Local Governments



Fuente: Cálculos propios FMM.

Example of Infrastructure gaps in Peru (2016)

- Stock of highway network represents one third of the LAC's region. Peruvian economists: Zambrano y Aguilera (2011) estimated that the highway gap is 15% of GDP

- Gap in electricity is 11% of GDP; highway quality is 5 % of GDP; and water and sanitation is 0.6% of GDP

III. Focusing on measuring and closing infrastructure and service Gaps through the Public Investment Cycle: New Technical Approach and Methods

The new approach: Focus on closing gaps and manage the full investment cycle

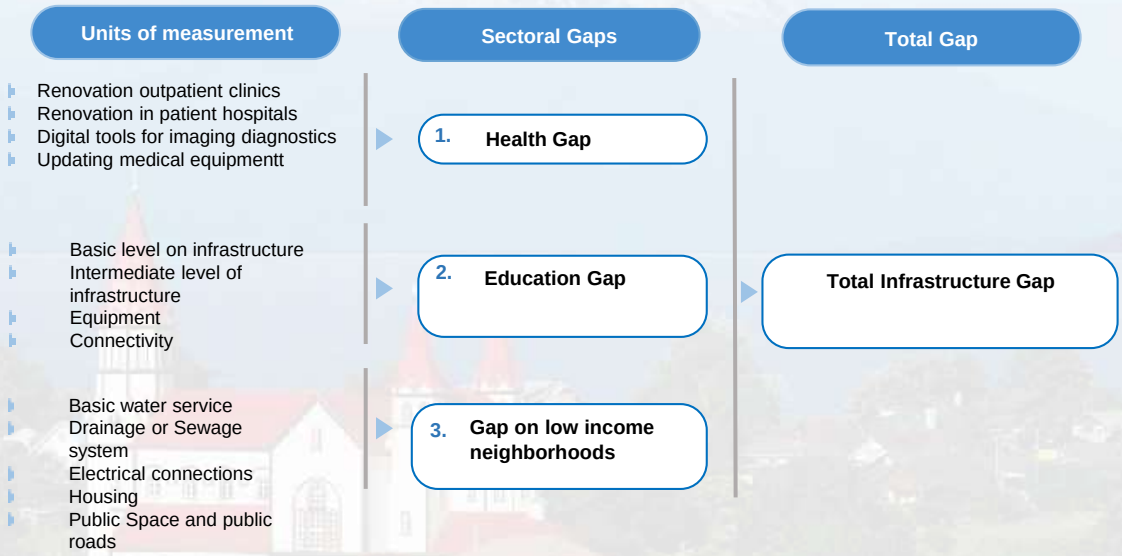
- Develop infrastructure gap analysis as the basis for a new multiyear investment plan
- Improve coordination con budgeting priorities
- Strengthen local institutions and human capital
- Introduce technological tools to gather information to foster better monitor and control of the investment cycle
- Introduce the infrastructure acquisition process as part of the investment cycle
- Promote ex – post analysis to measure development impact of public investment

Estimating gap on Health sector: Example in Argentina

- Index of Need: Algorithm that estimates the need of a given population group to have Access to a Health Unit in the territory, as a function of population density and their distance to the asset

- Index is estimated as a function of accessibility to existing infrastructure (quantity and capacity of hospitals, population and distance to hospitals)

Multi criteria approach in Argentina to measure infrastructure gaps



Infrastructure and Inequality

Could Long-Term Investments in Infrastructure Reduce Inequality?

- Test for possible link b/w infrastructure and inequality:
- use US state-level panel data from 1950 to 2010
- Ginis data from van der Weide and Milanovic (2014):
- bottom 40% and top 40%
- Infrastructure data from US Census Bureau:
- health, education, highways, judicial, etc
- Regress Ginis in year t on real growth rate of infrastructure
- spending in decade **prior to** time T

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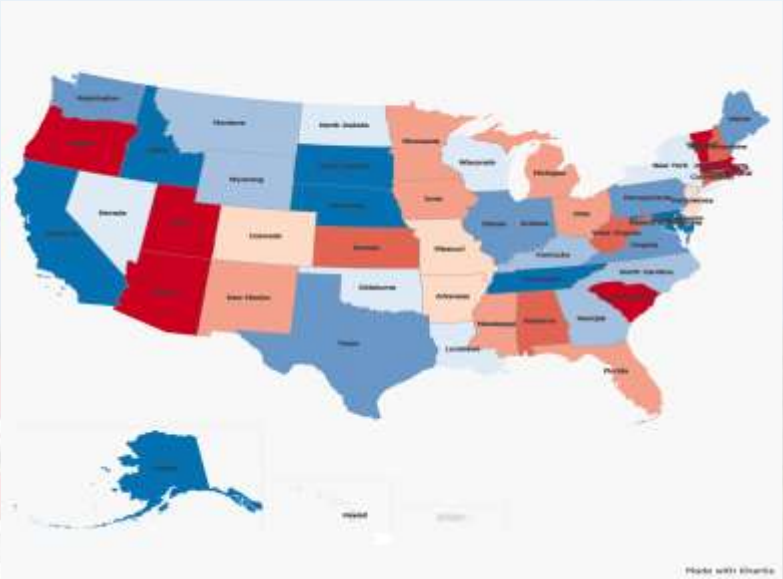
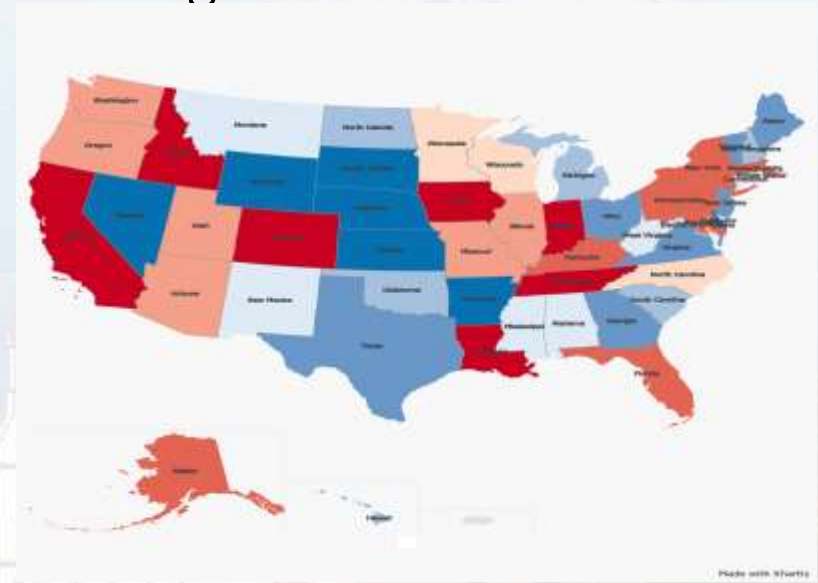
Measuring the impact of infrastructure spending (o lack thereof) on equality

- Inequality correlates negatively with **past** infrastructure spending growth
- Highways and higher education spending most significant
- Results stronger with bottom inequality and for highways
- Data neither reject causal effect from infrastr. to inequality
- nor support reverse pattern (**caveat**: no causality test)
- Counterfactual exercise identifies losers/winners

Winners and Losers for Highway growth



Winners and losers due to higher education growth



Closing infrastructure gaps that affect equality: The example of USA

- Lack of infrastructure in education affects test results and access to higher levels of education in the medium term

- Lack of investment in roads and networks affect generation of economic opportunities in the long run

Gender Composition of Evaluating Teams Matters

Introducing variables to close environmental and gender gaps

- IDB studies show that more women participating in the investment cycle decision making process promotes more investments in health, education, climate resilience infrastructure.
- IDB study by Yanez-Pagan 2014.

Using hedonic pricing to measure Gaps in Urban Quality of Life: Lack of basic infrastructure and amenities

- Households that lack solid waste management services, report a 13% lower level of life satisfaction than households that enjoy the Service.
- These households are situated in the lower two income deciles.
- Individuals who have solid waste management services that have a coverage that is 10% lower than average, report:
  - 1% lower level of life satisfaction.
  - 2% lower level of satisfaction with the neighborhood.
  - Furthermore, housing values fall around 3% of their market value.

Source: Quality of Life in City of Guatemala, 2012, (IDB)

Final Thoughts

- ✓Need to expand the theoretical framework to new methods of project analysis
- ✓Variety of technical approaches influenced by institutional arrangements
- ✓Team composition matter

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