


Coastal investment in the age of climate change

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Cities have historically benefitted from coastal access, but sea-level rise may turn this advantage into a vulnerability. Government investment should account for future climate risks.

Coastal cities have long been centres of economic activity. Natural harbours facilitate trade and transportation, and flat, fertile lands support agriculture and industry. But climate change threatens to turn these historic advantages into liabilities. Climate change models predict rising sea levels, more frequent and severe storms, and increased flooding, each with disproportionate impacts on coastal cities¹. At the same time, coastal zones are more densely populated than inland regions, and they continue to experience higher rates of population growth and urbanization².

A recent study in the *American Economic Review* by Clare Balboni asks how sea-level rise will affect government investment in these coastal areas³. The analysis focuses on Vietnam, where government infrastructure investment has historically favoured coastal areas⁴. The country's extensive coastal and river delta regions are particularly vulnerable to the impacts of sea-level rise. Roughly 5% of the country's land area is at risk of inundation under sea-level rise of 1 m, which falls within range of century-end projections⁵. The resulting coastal and river flooding will impact roughly 15 million people in the coming decades⁶. In this setting, the author finds that coastal favouritism has large costs.

Balboni draws on detailed geographic data to study road investment from 2000 to 2010. The data show sustained coastal investment despite the risk of sea-level rise. The author then develops an economic model for simulating the effects of road construction on economic activity. The model captures rich heterogeneity across space, with locations that differ in terms of productivity and amenities. Locations interact with each other through migration and trade, as households choose where to migrate and firms use household labour to produce traded goods. The model also captures rich interactions over time. Households consider both current and future payoffs in choosing where to live and work, and infrastructure investment creates long-lived economic clusters with long-run inundation risk.

The first main finding is that sea-level rise affects the returns to infrastructure investment over time. If we ignore the risk of future inundation, then we overstate the gains from Vietnam's coastal road investments by more than 50%. The second main finding is that sea-level rise affects where road investment should be concentrated. Vietnamese road investment would have had even larger benefits had it been less concentrated at the flood-prone coast.

These results point to an important policy trade-off. In the short run, coastal investment has high returns because it supports economic activity that is currently clustered in coastal areas. Improving road infrastructure boosts economic output by improving access to markets, reducing travel times and encouraging in-migration. But in the



long run, future sea-level rise implies that coastal investment will be at risk of inundation. By making coastal areas more attractive today, governments may inadvertently create 'lock in' that entrenches populations and industries in high-risk areas. It then becomes more difficult to relocate economic activity inland as coastal threats intensify over time. Continued coastal investment hinders future adaptation.

The study suggests that policymakers should redirect infrastructure investments towards safer inland areas. This approach can help to reduce climate risks, while still promoting economic growth. By investing in inland transportation and economic hubs, governments can create viable alternatives to coastal cities, smoothing the transition inland as sea levels rise. Political challenges complicate this narrow path⁷. But at minimum, governments should assess climate risks at each stage of infrastructure planning, accounting for long-term projected risks alongside short-term economic gains.

While the study focuses on Vietnam, its implications are global. From Jakarta to Lagos to New York City, coastal cities worldwide have built infrastructure that is now under threat from sea-level rise. Asian cities are particularly exposed, representing 8 of the 10 most exposed cities under sea-level rise of 1 m (ref. 8). Under sea-level rise of 2 m, inundation risk threatens more than 10% of the current infrastructure stock in Bangkok, Shanghai and Manila⁸. Anticipating this risk will be crucial for ensuring a sustainable future.

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Competing interests

The author declares no competing interests.