Adaptation as a Solution to Climate Change

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Introduction

- The World appears to be unwilling to cap global GHG emissions
- Fundamental free rider problem
- Climate Change is coming
- The **"Conventional Wisdom"** is that we are "doomed" because we are Homer Simpson
- Blissfully unaware of the coming days of reckoning

An Economist's View of Adaptation to Climate Change

- I question this "wisdom".
- In 2030, 60% of the world's population is forecasted to live in cities
- Think hard about how urbanites will cope and continue to thrive in the face of anticipated but uncertain climate change

Climate Change's Impacts on Our Cities

- Cities around the world will face:
  - Average hotter temperature
  - Sea level rise and flooding
  - Natural disaster risk as low probability horrible scenarios become more likely
  - Water scarcity
- Climate science can and will quantify this risk for each city
- Such measurement is their job!

Why Does An Economist Have Anything Interesting to Say Here?

- I do not have a "crystal ball" about what climate change will do to city X or city Z
- But, there is a long historical track record on how cities have responded to past disasters
- We also know a lot about how people respond to price signals and "new information"
- We know how profit seekers respond to perceived economic opportunities

Contrasting Carbon Mitigation and Climate Change Adaptation

- **Mitigation** = In a world with 7 billion people who each seek to live the American Dream there will be a lot of GHG emissions, obvious free rider problem.
- **Adaptation** = We want our family and friends to be happy and healthy
- Out of narrow self interest, we each have strong incentives to adapt to changing climate conditions

My Questions Today

- 1. What steps will individuals take to adapt?
- 2. How will urban quality of life be affected by climate change?
- 3. Who will lose and who will gain because of climate change?
- 4. Will government help or hinder adaptation efforts?

One Specific Urban Case Study from San Diego

- The San Diego Foundation's 2050 Study "A Regional Wake Up Call" Predicts:
- 4 degrees hotter on Average
- Sea level will be 12-18 inches higher.
- water demand up 37% while supply will down 20%
- Wildfires will be more frequent and intense.
- Smog Alerts
- Peak electricity consumption up 70%

The "Ugly Scenario" = Myopic Expectations

- We do not plan ahead
- Individuals ignore these challenges
- Governments ignores them
- Businesses ignore these threats and opportunities
- We are shocked and suffer when scarcity and climate change unfolds
- I don't believe this.

Opportunities and "Rational Expectations"

- Historical Case #1: The Case of Los Angeles in the early 20th century
- Growing population and not enough water
- Anticipate this imbalance, buy water from Owens Valley farmers and build infrastructure to transport it to Los Angeles
- Case #2: Investment in electric vehicles today due to expectation of "peak oil" and carbon regulation
- Case #3: Thom Mayne's Floatable homes

How Do Households and Firms Respond to these Predictions?

- Hotter climate and within MSA migration
- Water prices and electricity prices will rise and we will change our consumption patterns
- Endogenous technological innovation will reduce our water and electricity consumption
- Wildfire risk --- zoning and more sophisticated insurance contracts to encourage precautions
- Public health --- information on upcoming smog alerts

How will urban quality of life be affected by climate change?

- What if none of my optimistic San Diego predictions play out?
- Internet and “twitter world” keeps us fully informed,
- If a city such as San Diego’s quality of life suffers due to climate change, Households there can migrate to a Detroit or another Northern city whose quality of life is relatively better
- Migration acts as an implicit insurance policy

Who will "lose" and who will "gain" because of climate change?

- In a system of cities in which people and firms can migrate, migration protects urbanites against spatial shocks to urban places
- Today, you can trade one home near UCLA for 100 Detroit homes. As a forward looking investor, should you make this trade?
- If a city such as San Diego's quality of life suffers due to climate change, home owners there suffer an asset loss

Is Government a "Friend" or "Foe" of Climate Change Adaptation?

- The case of Los Angeles water pricing (0.5 cents per gallon)
- Why does Los Angeles have so much green grass and private swimming pools?
- Same issues for electricity pricing
- Local land use zoning: The case of Los Angeles
- Insurance markets and "price gouging"

Unintended Consequences of Government Investment in "Climate Proofing"?

- The Crowding Out Hypothesis
- If government builds impressive "Sea Walls" does this reduce private self protection as more people live in the area that can flood?
- Would the people of New Orleans suffer less from future floods if the government could pre-commit to build no sea levees?
- The cost of such "tough love" depend on existence of substitutes

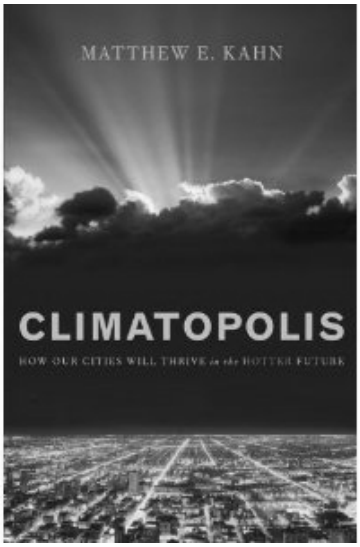
Cities in the Developing World

- Climate change's impact on farmer profits?
- If profits down, then Rural to urban migration accelerates ➔ The cruel logic of the "two sector" general equilibrium model:
- Urban wages down and urban rents up ➔ challenges for the urban poor
- Economic Development as a adaptation strategy --- Malaysia versus Singapore
- Environmental refugees and international migration

Conclusion

- A piece of irony that fascinates me:
- 1. cities have caused climate change
- But,
- 2. cities will protect us from climate change
- Why? Cities are our innovation hubs
- In an open system of cities, households and firms have ample choice over where to locate
- Footloose era, not tied down by "geographic destiny"

My New Book on This Subject



1912 Titanic Disaster Redux?

- 1. Didn’t believe that a iceberg could sink such a ship
- 2. Didn’t see the iceberg
- 3. No time to seek out a new course
- Unlike the Titanic, the climate scientists are offering us continuously updated tips about the dangers posed by our “iceberg”
- We know that “we do not know” what we face