

Parrish Bergquist: “US State Climate Policy Commitments, the Energy System, and the Economy”

Abstract: In the United States, state governments have been the locus of action for addressing climate change. But the lack of a holistic measure of state climate policy has prevented comprehensive assessment of their effectiveness. Here, we aggregate information from over 20 individual policies to develop a holistic index of state climate policies from 2000-2020. Our measure highlights variation between states which is unobservable in studies focused on single policies. Next, we examine the environmental and economic consequences of state climate policy. A standard-deviation increase in climate policy stringency is associated with a 9.3% reduction in electricity-sector CO₂ emissions and a 3.8% reduction in economy-wide CO₂ emissions. We do not find evidence that more stringent climate policy harms states' economies. Our results make clear the benefits of state climate policy, while showing that current state efforts are insufficient to meet the US goal under the Paris Climate Accord.

Ellen Bruno: “Consequences of Climate Change Adaptation: Agricultural Wells and Access to Drinking Water”

Abstract: Adaptation actions taken to mitigate climate damages may impose negative externalities on vulnerable populations. We study this in the context of groundwater in California and evaluate the effects of annual fluctuations in weather and surface water supplies on agricultural well construction and access to drinking water. Using the population of geocoded wells, we show that farmers respond to extreme heat and surface water scarcity through agricultural well construction. This mitigating behavior by agricultural users imposes costs, as extreme heat and surface water scarcity reduce local groundwater levels and lead to domestic well failures. Our findings suggest that an unintended cost of agricultural groundwater extraction is reduced access to drinking water supplies in disadvantaged communities.

Rhiannon Jerch: “Local Public Finance Dynamics and Hurricane Shocks”

Abstract: Since 1980, over 2,000 local governments in US Atlantic states have been hit by a hurricane. We study local government fiscal dynamics in the aftermath of hurricanes. These shocks reduce tax revenues, public expenditures, and debt financing in the decade following a hurricane. Hurricanes create collateral fiscal damage for local governments by increasing the cost of debt at critical moments after a strike. Municipalities with a 1 standard deviation-above-average racial minority composition suffer expenditure losses more than 2 times larger and debt default risk 8 times larger than the average municipalities in the decade following a hurricane strike.

Akshaya Jha: “Blackouts: The Role of India’s Wholesale Electricity Market”

Abstract: Electricity blackouts impose substantial economic costs on firms and households. This paper advances a new explanation for their continued prevalence in India, the world's third-largest power sector. Using novel data on India's wholesale electricity sector, we demonstrate that utilities satisfy less electricity demand when wholesale procurement costs are high. As a result, supply-side misallocation of output across power plants can decrease the quantity of electricity supplied to end-users. We provide evidence that a substantial share of the supply-side misallocation in India arises from discretionary power plant outage—outages called by suppliers for economic rather than technical reasons. Reducing supply-side misallocation by returning plants on discretionary outage to service significantly lowers procurement costs, resulting in increases in the quantity of electricity purchased by utilities sufficient to eliminate roughly 70% of reported shortfalls between quantity demanded and supplied.

Meera Mahadevan: “You Get What You Pay For: Electricity Quality and Firm Response”

Abstract: The Indian Electricity Sector is composed primarily of state-owned electricity utilities that make massive losses, often costing the central government billions of dollars a year to bailout. These losses are driven by the prevailing low prices of electricity, non-payment of bills or theft, and non-metering of electricity use. This creates a vicious cycle where electricity is treated as an entitlement, with low utility revenues, unreliable supply, and low willingness-to-pay for electricity. Using a large reform in the sector, I show that differing implementation of this reform across states resulted in variation in the institutional structure of electricity provisioning. In particular, I find that some states were able to improve the reliability of their electricity supply. In response, manufacturing firms scaled up their consumption of grid-electricity, showing a willingness to pay higher average prices for reduced blackouts. Firms also re-optimize their production decisions: increasing purchased electricity, worker hours and worker productivity. These results demonstrate that some institutional changes could potentially propel the sector out of the low-price/low-electricity equilibrium in India.

Frederik Noack: “Multinationals vs Mother Nature? The Impact of Multinational Firms on the Environment”

Abstract: The environment worldwide is in a sorry state, as fossil-fuel driven global warming is putting stress on plants, animals and humans alike. This dire picture should however not veil the fact that not all countries are equal in suffering. Air pollution and deforestation are (at least half-heartedly) combated in some rich countries, while in many poor areas of the globe these key issues are as pressing as ever. Paradoxically, improved environmental regulations in the developed world may have contributed to the environmental problems of the developing world. This concern may be especially salient for multinational firms that can easily shift production between affiliates in different locations. Although this problem is theoretically well understood, (causal) empirical evidence is scarce.

2022 Young Scholars Symposium

Abstracts

Here, we use a unique spatially fine-grained panel of multinational companies' activities in Africa to quantify their impact on the environment. Our results show that an exogenous expansion of multinational firm activity causes severe losses of forest cover, degraded biodiversity and an increase in air pollution. Further, we find that the environmental degradation is not caused by economic activity in general, but specifically by the activity of multinational firms, mainly from the primary sector. This finding could hardly be more striking: For a fixed amount of economic activity, the firm structure matters heavily, as having more multinational rather than domestic firms results in more severe environmental degradation.

These findings suggest that domestic environmental regulation in rich countries may not suffice to efficiently curb global environmental destruction, and the regulation of multinationals operation abroad may need to be stepped up. Intuitively, a poor country's bargaining position may be dismal when in front of a powerful multinational conglomerate.

Hence, rather than relying solely on the local government's environmental regulation, the multinational's home country (say, the United States or France) has more leverage to regulate its international firms. The stakes could hardly be higher: Addressing the mobility of polluting industries will be crucial for combating global environmental problems including biodiversity loss, deforestation, pollution and climate change.

Louis Preonas: "Groundwater in a changing climate"

Abstract: Common-pool resources typically require management to achieve the socially efficient level of use. Groundwater, which amounts to nearly 30% of all global freshwater, is subject to this "tragedy of the commons," where private agents fail to internalize how today's extraction depletes the stock available to future users. This has led to rapid depletion of global aquifers, which has increased by over 20% between 2000 and 2010 (Dalin et al. (2017)). Agricultural irrigation is the primary driver of aquifer depletion, and climate change is likely to exacerbate groundwater management challenges: while extreme heat damages crop yields, irrigation can mitigate heat-induced crop loss. This paper quantifies the effects of climate change on groundwater extraction in California's agriculture sector. We develop a stylized dynamic model to illustrate how higher temperatures increase farmers' groundwater demand, which hastens groundwater depletion. We then use rich pump-level microdata to empirically estimate a temperature-response function for groundwater pumping. We find that California farmers increase groundwater consumption by 3.5% per day above 40 °C, incurring a cost of \$300 per acre per hot day. We will use these estimates to calibrate a dynamic simulation of groundwater extraction under climate change.

Jennifer Raynor: "Economic Effects of Wolf Recovery on the Agricultural Sector in the United States"

Abstract: There has been significant backlash to gray wolf recovery in the United States and Europe, largely due to concerns about livestock predation. However, these debates often focus only on the direct costs of wolves and ignore the potential for wolves to reduce damage caused by other

species, such as deer and coyotes. We use data on production, income, and losses for livestock, milk, and crops to evaluate the direct and indirect economic effects of wolves on the agricultural sector. Our analysis relies on the quasi-experimental variation in the timing of reintroduction programs across states and on the natural expansion of wolves over space and time. We find that wolf recovery has no effect on livestock revenue, meat or milk production, or total losses. Perhaps counterintuitively, we find that wolf recovery leads to a sharp decrease in predation losses for calves, due to a decrease in the share of coyote predation losses. Wolves kill or drive out coyotes, which are more likely to prey on livestock. For crops, we find that wolf recovery has no effect on total crop revenue or crop insurance payments, which suggests wolves have little effect on damage caused by deer and other cervids. However, we are currently exploring heterogeneous effects by crop type, including corn, soy, and rangelands and pasture. Overall, we find that the indirect effects of wolves may outweigh the direct costs of wolf predation on livestock. This finding is important not only for wolf management, but also for broader economic research on the costs and benefits of wildlife—namely, economic analyses that ignore indirect effects risk drawing the wrong conclusion about net economics impacts.

Shaoda Wang: “Does the Squeaky Wheel Get More Grease? Citizen Participation, Social Media, and Environmental Governance in China”

Abstract: Countries around the world have launched public disclosure programs to stimulate citizen participation in environmental governance, yet little is known about when such participation affects regulation and pollution. We conducted a nationwide field experiment in China and randomly assigned firms to public or private citizen appeals whenever they violated pollution standards. There are three main findings. First, public appeals to the regulator through social media (i.e., Weibo, which is similar to Twitter) reduced violations by more than 60% and decreased air and water pollution emissions by 12.2% and 3.7%, respectively. In contrast, private appeals caused more modest environmental improvements. Second, experimentally increasing the visibility of social media appeals about a violation by adding “likes” and “shares” to the Weibo post increases oversight of firms by regulators, suggesting that regulatory effort is an important source of improvement in firms’ environmental performance. Third, we randomly varied the proportion of firms subject to appeals at the prefecture-level and find that the general equilibrium effects do not offset the partial equilibrium impacts and may even strengthen them.

Casey Wichman: “Pricing municipal water”

Abstract: This paper seeks to understand the implications of inefficient municipal water pricing in light of rapidly growing urban populations and climate change. I explore water utility pricing decisions with annual water rates data and utility financial information for more than 900 water utilities in the Southeastern US. Although the efficient water price is its long-run marginal cost of provision, I provide suggestive evidence that utilities price water below average cost. I explore the role of alternative rate structures adopted in light of their intended joint goals to encourage

2022 Young Scholars Symposium

Abstracts

conservation and maintain revenue stability. Finally, I estimate revenue and demand elasticities using aggregate data that will aid in characterizing the efficiency costs of water pricing moving forward.