

I am a public economist focusing on three topics: the importance of leaders in local public goods provision, the role of algorithms in social service targeting, and local public finance in middle-and low-income countries. In answering these questions, I apply modern causal inference methods to administrative and survey data.

### **The importance of leaders in local public goods provision**

In the U.S., leaders of local law enforcement agencies are often elected. However, the impact of leaders' political preferences on frontline policing is not well understood. My job market paper, "Political Party Affiliation of Leaders and Traffic Stop Policing: Evidence from North Carolina" (under review), examines how leaders' political party affiliation affects one of the most crucial group disparities in the U.S.: racial disparities in policing. I compare counties that experience no change of political authority of sheriffs (Democratic-to-Democratic) with counties that change political control due to elections (Democratic-to-Republican). Using a difference-in-differences strategy, I show causal evidence that Republican leadership increases Black drivers' share in traffic stops by 3.8 percentage points—a 15.7% increase relative to the baseline. Republican leaders also widen the racial disparities in searches within moving-violation stops. Notably, the increase in racial disparities is not accompanied by changes in the productivity of the stops, measured by unconditional contraband finding rates and motor vehicle crash counts. In a companion paper, "Political Party Affiliation of Leaders and Personnel Composition: Evidence from North Carolina" (with Samuel Krumholz), we document that Democratic deputies are more likely to leave the agency or switch party registration than Republican deputies after DEM-to-REP turnovers, producing an 18 percent decline in the Democratic share of deputies. The race and gender composition do not respond to sheriffs' party turnovers. Together, these results show that partisan leadership can shape both the behavior and composition of law enforcement agencies.

### **The role of algorithms in social service targeting**

Governments increasingly rely on algorithmic or rule-based systems to allocate social welfare resources. While these tools may enhance targeting efficiency in the general population, they can also exacerbate inequities across different groups. Further, these tools do not always ensure that the priority of provision aligns with welfare gains. My second research agenda examines how targeting rules influence group disparities in social welfare systems and investigates ways to improve their fairness and effectiveness.

In "Disparate Impact of Social Safety Net Inclusion on Internal Migrants in Indonesia," I show that in the first stage of Indonesia's social welfare program targeting, the proxy-means-testing algorithm systematically overestimates internal migrants' consumption levels, resulting in exclusion errors that are 8 percentage points higher for migrants than for locals. My next step will explore whether the second stage—discretionary targeting by local village heads—mitigates or worsens these disparities introduced by the algorithm. By integrating these findings, I aim to assess whether community targeting based on local information can complement algorithmic targeting based on general information.

Two other ongoing projects focus on how rule-based and algorithmic decision-support tools impact service allocation in domestic violence and elderly abuse support in Taiwan. The first project, "Targeting on the Boundary: Improving Composite Scores through Multi-Dimensional Regression Discontinuity Designs" (joint with Kuan-Ming Chen and Yu-Chang Chen), studies how to improve rule-based targeting systems that assign treatments based on composite scores. Many programs rely on composite scores

constructed as weighted sums of several characteristics, where the weights are often chosen heuristically or to predict eligibility rather than to maximize welfare. Our key idea is to treat the score cutoff as a boundary in a multi-dimensional covariate space (depending on the number of characteristics used) and estimate treatment-effect heterogeneity along that boundary. Heterogeneity implies that existing weights are inefficient, and reweighting toward individuals with higher treatment effects can improve welfare without expanding program size. We plan to apply this framework to Taiwan's Intimate Partner Violence Danger Assessment (TIPVDA), an 18-item risk scale used by social workers to determine whether a reported domestic-violence case receives a comprehensive service package. We have secured linked administrative data that include (i) the item-level TIPVDA responses, (ii) social-worker treatment decisions, (iii) health-care utilization from the National Health Insurance system, and (iv) earnings from tax records.

The second project, "Algorithmic Risk Scores and Targeting in Social Services: Evidence from Elder Abuse Cases in Taiwan (with Harrison Chang, Shiau-Fang Chao, and Kuan-Ming Chen)," examines how machine-learning (ML)-based risk classifications shape frontline social-service decisions. Since 2020, each elder abuse report receives a continuous risk score from a ML model trained on past follow-up decisions. Before deciding whether to follow up, social workers see the report's risk category—high, medium, or low—derived from that score. We have two goals in this project. First, we will exploit score thresholds in a regression-discontinuity design to test whether service provision responds to risk categories and to estimate the causal effects of follow-up services on elders' health outcomes. Second, we will investigate how algorithmic advice affects resource allocation across cases and whether the influence of the advice varies with worker experience. These investigations will showcase how algorithms interact with human discretion in the delivery of social services. We have secured linked administrative data that includes (i) the inputs to the ML algorithm, (ii) the algorithm itself and the risk category thresholds, (iii) social worker follow-up decisions, and (iv) health-care utilization from the National Health Insurance system.

### **Local public finance in middle-and-low-income countries**

Fiscal capacity is central to state effectiveness. My third line of work studies how local governments in developing economies mobilize and deploy fiscal resources, through both informal channels and inter-governmental transfers.

In "Electoral Cycles of Informal Taxation and Welfare Benefit Provision: Evidence from Indonesian Villages", I examine how village heads adjust informal taxation (defined as labor and money contributions coordinated by local government officials and enforced socially) and rice-subsidy distribution around local elections. I find that, in election years, lower-expenditure households pay less informal taxes, and average households receive more subsidized rice. As a result, the overall local public finance system becomes more progressive, suggesting that electoral incentives can discipline local public finance arrangements.

In a new project, "Decentralizing Development: Structural Transformation Effects of Indonesia's Village Fund (with Holt Dwyer)," we study how large fiscal transfers affect local economic development and structural transformation. Each year since 2015, Indonesia's central government has allocated Village Fund (*Dana Desa*) to more than 74,000 villages (*desa*). A key feature of the Village Fund is that, between 2015-2018, 90% of the transfer was the same amount to each village, regardless of population size, creating substantial per-capita transfer variation. Currently, we analyze at the district level. Exploiting variation in the number of villages per capita, we use a continuous difference-in-differences design to estimate the causal impacts of the transfer on local government spending and the fiscal multipliers on household consumption. We are extending the analysis to examine village-level infrastructure, land use, and de-

forestation outcomes to trace how fiscal resources translate into production and environmental changes. This project contributes to our understanding of how fiscal capacity shapes local economic activity and provides one of the first estimates of fiscal multipliers in middle- and low-income countries utilizing within-country variation.

**Other research: political preference formation.**

I also work on the formation of political preferences. In “Curriculum and National Identity: Evidence from the 1997 Curriculum Reform in Taiwan” (with Ming-Jen Lin and Tzu-Ting Yang, *Journal of Development Economics*, 2023), we exploit Taiwan’s 1997 junior-high curriculum reform—which introduced a Taiwan-centered perspective in history textbooks—to estimate the effect of textbook content on students’ national identity. With a regression discontinuity design, we find that students exposed to the new textbooks were more likely to hold an exclusively Taiwanese identity rather than a dual identity (i.e., Taiwanese and Chinese). However, the effect of the new textbook disappears in students’ 30s, as the national identity of students who study the old textbooks catches up with those who study the new ones. Our findings suggest that political preferences continue to evolve through labor-market and social experiences. The findings underscore the importance of long-term dynamics in understanding preference formation.

**Policy and data work in New Zealand**

During my postdoctoral fellowship at the New Zealand Policy Research Institute, I focused on gaining experience in collecting survey data and becoming familiar with New Zealand administrative data, which is centrally managed in the Integrated Data Infrastructure (IDI). I contributed to designing the first elderly abuse national survey in NZ. Utilizing data in the IDI, I estimate elder abuse prevalence rates and analyze the impacts of abuse on older people’s health and income. In a pilot study of how clinics integrate mental-health services into primary care, I co-designed the survey module to estimate the costs and benefits of integration. I will continue to utilize New Zealand’s administrative data in current and future collaborations.