

# Research Statement

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I am driven by questions at the heart of *political economy*, *economic development*, and *economic history*. My research centers around understanding how economic change and industrial development are shaped by political forces—in particular, elite politics and the state. I attempt to answer substantive questions in this domain by combining institutional knowledge, theoretical clarity, and careful empirical design. This empirical work increasingly incorporates the techniques and tools from machine learning to extract new data from unconventional sources. Part I of this report describes the studies that encompass my agenda. These experiences have inspired me to create *SoDa Laboratories*. I describe the outputs and experience of my lab in Part II.

## I. Research

### 1. Political Economy of Industrial Development

A central concern of my research is the political economy of transformation and industrial development. Specifically, the efficacy of state interventions and *industrial policy*. Though industrial policies are ubiquitous, the empirical literature on their efficacy is thin. The following work is an attempt to unpack these under-explored interventions through contemporary empirical tools:

- *“Manufacturing Revolutions - Industrial Policy and Industrialization in South Korea”*

My project studies the impact of industrial policy on industrial development by exploring a canonical East Asian intervention. Following a political crisis in 1972, South Korea dramatically altered its development strategy with a new sector-specific policy: the Heavy Chemical and Industry (HCI) drive. With newly digitized data, I use the sharp introduction and withdrawal of the targeted policy to study its impacts. (1) I show HCI successfully promoted the evolution of directly treated industries. Next I provide evidence for two key justifications of industrial policy: network and dynamic externalities. (2) Using variation in exposure to policies through the input-output network, I show HCI indirectly benefited (non-treated) downstream industry. (3) Finally, I show both direct and indirect benefits of HCI persist even after the policy is withdrawn, following the 1979 assassination of President Park. Together, my findings suggest that the temporary push helped shift the economy into higher value-added activity. **Click for recent paper.**

- *Nascent projects on industrial policy - with Reka Juhasz (Columbia), Changkeun Lee (KDI), and Krisztina Orban (NBER)*

A number of fresh projects build off of my work on South Korean policy. Together, Dr. Changkeun Lee of the Korean Development Institute and I are working on two projects using access to newly released confidential data on South Korean development. The first, *“The Impact of Export Promotion Meetings on South Korean Trade Performance”* uses de-classified transcripts from General Park’s monthly trade promotion meetings to understand the role of administrative coordination on the 1960s Korean trade boom. This project utilizes both detailed textual analysis and

rare monthly trade data to study the legacy of Park's industrial policy institution. More conventionally, alongside Dr. Krisztina Orban of NBER, we are using newly-released firm micro-data from the 1960s to study the impact of export promotion policy on aggregate growth. Our methods utilize techniques developed by Orban during her Ph.D. dissertation. My newest project with Reka Juhasz (Columbia University), addresses an empirical blind spot in understanding industrial and trade policy interventions. This project applies text mining techniques to GATT and UNCTAD archives, with the goal of constructing cross-country, cross-industry indices of policy interventions. Since industrial policies are usually not observed systematically, our project endeavors to fill a critical void. By doing so, we hope to broaden our comparative understanding of the political economy of industrial policies.

An adjacent set of projects explore how politics shape industrial outcomes. Rather than studying the efficacy of intentional state action, this work instead explores how political forces, such as class conflict and predation, impact firm (and industrial) performance.

- ***Returns to Repression - Institutions and Firm Responses to Activist Assassinations* - with David Kreitmeir and Paul Raschky (Monash)**

Civil society is seen a key ingredient to political and economic development. Our study explores the consequences of repressing civil society. We do so by analyzing market responses to a severe form of repression: the extra-judicial assassinations of activists in resource-rich economies. We conduct an event study using hundreds of rare, hand-coded records on activist assassinations—including the names of companies proximate to violence. To implement this unique, large-scale asset price study, we create firm-level measures of “exposure” to violence and compare the cumulative abnormal returns (CARs) across firms differentially exposed to events. By analyzing outcomes before and after violence, we answer two questions: 1) Examining asset price movements prior to killings, we test for whether markets reveal prior knowledge of violence. 2) Our main analysis then explores asset price movements after assassinations to investigate investor responses to violence. We find extra-judicial killings lead to highly significant negative abnormal returns for companies associated with violence. These effects are also highly persistent. Next, using the rich global reach of our study, we explore how market reactions vary by measures of institutional quality. We show the extent to which firms face repercussions from violence is significantly related to the quality of state institutions. Thus, our findings indicate that markets punish firms most likely to benefit from the suppression of civil society, though less so under weak states.

- ***Workers of the World, Unite: The Economic Effects of Labor Day Demonstrations in Europe* - with Andreas Madestam (Stockholm University) and David Yanagizawa-Drott (U-Zurich)**

My work with Andreas Madestam and David Yanagizawa-Drott examines the impact of social movements on economic activity, vis-a-vis the strength of labor. We study the impact of union movements and mobilization on industry (and firm) outcomes. This study considers weather events on a single day—May 1st—as a shock to May Day participation, studying the impact of (symbolic) union strength on subsequent strike activity. We construct shocks using 100 years of rich weather data and the assistance of high-dimensional regression methods. We take our measures to 100 years of unique strike data, which we construct using computational techniques from natural language processing (NLP). Our NLP techniques allow us to extract, date, and geolocate strike events from historical news archives. Our results show that May 1st weather—and only May 1st weather—has a surprisingly robust impact on subsequent strike activity. We use our shifter of union strength to then study its impact on industrial outcomes. Using asset price data, we find May 1st activity is predictive of negative excess returns for firms most sensitive to labor costs and unionization. Importantly, we hope to next focus on outcomes related to the labor share of income and outcomes related to labor's bargaining power.

- ***Nascent work on labor market institutions and industrial development* - with Daron Acemoglu (MIT) and Changkeun Lee (KDI)**

This new project started during my postdoc and has grown the past year. With Daron Acemoglu (MIT), “*Democratization, Labor Repression, and Manufacturing Development in South Korea*” seeks to understand how the South Korea’s democratic transition 1987 contributed to improvements in industrial development. Specifically, productivity and technological change. We focus on one specific dimensions of Korean democratization: the democratization of labor market institutions. Since the Park-era (1961), South Korea had pursued a policy of strict labor repression. This included the outlawing of unions, wage controls, and the direct use of force to crush labor movements. We build measures of labor unrest for the pre-1987 period, applying natural language processing to an archive of historical newspaper coverage. Having constructed these measures and secured access to administrative firm data for the period., our goal is to study how the lifting of labor tensions may have translated into economic growth.

## 2. The Political Economy of the (*Historical and Digital*) State

A second strand of research focuses explicitly on the political economy of the state. I explore the interaction between the economy and state in two ways: First, unpacking how precise features of state institutions influence development. Second, exploring how economic forces, specifically technological change, shape government power. I describe the former below,

- *The Historical State, Local Collective Action, and Economic Development in Vietnam*" (2018) - with **Melissa Dell and Pablo Querubin**. *Econometrica*, 86(6), 2083–2121.

There has been a large divergence in economic prosperity between Northeast and Southeast Asia since the mid-20th century, and the governance organizations and norms of Asian societies plausibly explain this divergence. Our study examines the impacts of different historical governance norms on development using Vietnam as a laboratory. Northern Vietnam (Dai Viet) was ruled by strong state institutions inherited from China. It governed through a centralized, competitively selected bureaucracy, and the village was the fundamental administrative unit. Southern Vietnam was a weak tributary of the Khmer (Cambodian) Empire. It followed a patron-client model with more personalized power relations and no village intermediation. We use a regression discontinuity design across the Dai Viet-Khmer boundary to compare villages that had a strong state to nearby areas that did not. We find that areas historically under the strong state have higher living standards today. Using rich data from South Vietnam and the unified Socialist Republic of Vietnam, we document that in villages with a bureaucratic historical state, citizens have been better able to organize for public goods and redistribution through stronger local governments and civil society. Overall the study suggests that the bureaucratic state in East Asia - deeply embedded in civil society - played a central role in this region’s growth.

- *Learning the Lay of the Land: A Machine Learning Approach to Measuring Sub-National Institutions* - with **Alistair Bayless and Paul Raschky (Monash)**

Economists often rely on national-level measures of institutional quality. Using high dimensional machine learning methods, we provide a framework for recovering sub-national measures of institutional quality where previously only national-level measures were available. Using random forest methods, we fit well-known measures of institutional quality (e.g. *PRS Ground Measures*) on millions of geocoded observations of political events. Specifically, we construct unique event data using both full-text newspaper archive datasets, as well as decades of translated news from the CIA. Random forests allow us to create a highly predictive the mapping from event data to institutional quality codings. Since our event data contains *sub-national* geolocations, we then use our model to create (predict) sub-national indices of institutional quality using local news events. First, we substantiate this our measures, *i*) showing that our indices correspond to well-known separatist struggles in Indonesia and the Philippines, and *ii*) showing that our annual measures tracks the widely-used textual **Policy Uncertainty Index** of *Baker, Bloom, and Davis (2016)*. Second, using historical news data, we are able to perform out of sample prediction, effectively creating historical measures of institutions for 1950-1986, period before the start of common institutional

quality measures. Last, we demonstrate that our measure can be used to study canonical questions on the relationship between growth and institutions—but utilizing global sub-national variation and longer historical scope.

The next group of studies explore the emergence of what we call the “digital state,” theorizing and measuring the extent to which information technology is transforming governance:

***Information is Power - Monopoly Power, Information Technology, and the Rise of the Digital State - with Weijia Li (Monash)***

Once seen as a weapon of freedom, informational technology has drastically transformed state capacity—often with unintended consequences. Our study analyzes the rise of the digital state. We do so by proposing a theory of how recent trends in monopoly power fueled the demand for information technology, and how these technologies, in turn, spilled over to the state. In our model, we show information technologies that allow monopolists to extract surplus from consumers also enable states to more efficiently exercise a monopoly of violence. Since this technology transforms the costs and consequences of repression, we study how the digitization of the state impacts preferences for (digital) democracy and (digital) autocracy. A key insight is that information may reduce the costs of autocracies to deploy repression, which in turn makes autocracy more palatable to elites and citizens. We provide empirical insights into main components of our model, using newly collected data on state technological adoption.

***Seeing the Digital State - Measuring Digital Capacity of the State with 1 Trillion Internet Observations - with Klaus Ackerman, Simon Angus, Weijia Li, and Paul Raschky.***

State power is shaped by technology. Just as formal bureaucracy, textual records, and road networks transformed the state power, so is digital technology. Governments are increasingly relying on the internet and information technology to fulfill their basic functions. Our study creates new unique measure of an emergent dimension of state capacity: the digital reach of the state. We use supervised machine learning methods to combine rare data on 1) the universe of worldwide IP address and 2) all known government organizations (entities). Doing so allows us to measure the scope of IP space utilized by government entities—as well as their activity (measures via “latency”). We provide a visual representation of our measure, mapping the spatial nature of government internet activity. We next provide the determinates and characteristics associated with the expanding informational capacity of states over the past years. In doing so, we show how the organization of the digital state varies by regime-type; the extent of decentralization; and the monopoly power of the communications network. Together we demonstrate our data allows social scientists to study a rapidly transforming dimension of governance.

## **II. SoDa Laboratories**

As an economist and social scientist, I draw inspiration from data science, open source, and hacker (in the traditional sense of the word) communities. As economics becomes increasingly data-driven, I felt there benefits from adopting the collaborative norms of these worlds into research. Thus, in 2018 I co-founded SoDa Laboratories (from *Social Data*) with fellow economists and data scientists, Dr. Paul Raschky, Dr. Simon Angus, Dr. Klaus Ackerman.

Within a year SoDa Laboratories has thrived. From four original co-founders, we now consist of 35 members—spread across fields such as econometrics, information science, computational linguists, legal studies, and, of course, economics. In 2019 we formalized the lab within Monash Business School, under the mentorship of our new dean, Dr. Simon Wilkie, former Chief-Economist of Microsoft.

Between the four co-founders, we supervise six honours students, four masters students, and six PhD candidates. We do so with the help of a lab-based model, with regular project-specific meetings and a general lab meetings. Importantly, the lab functions around a model of delegation, which we coordinate through an active Slack group, GitHub, and a project management ecosystem.

Our motivation is to answer substantive economic questions—specifically, those in political economy—by creatively producing new data. Specifically, we incorporate techniques from data science and machine learning to extract new information from “large” unstructured data. Our work is organized around three mediums: image, text, and social network data. Examples include, 1) Using convolutional neural networks to extract measures of capital investment from satellite imagery in Africa; 2) Using random forests to generate measures of sub-regional institutional quality from textual archives; and 3) Creating platforms for harvesting public data on the speech of international politicians.

The lab has built scalable tools for collecting new data. Our IP-Observatory.org project continually generates real-time information of global internet activity. This data has been used to observe a diverse events, from Hurricane damage in the Caribbean to politically-motivated internet shutdowns in the Middle East. The observatory technology is now commercially licensed and, importantly, is being used for a portfolio of research projects on the political economy of the digital state (Part I.2).

My lab has currently been awarded university funding for a postdoctoral scholar, a full-text developer, and PhD students under Monash University’s Policy and Governance Initiative. As well, we have currently submitted multiple grants under Monash University’s AI push. With my SoDa Lab co-founders, I am a principal investigator on a forthcoming Australian Research Council–Discovery Project grant (2020 round).