No Free Lunch: Unintended consequences of overload in the justice system

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Abstract

This paper evaluates the effect of unfunded legal reforms on judicial productivity. I use data and evidence from one of India's largest state that prohibited the manufacture, consumption and sale of alcohol and charged violators with criminal penalties - having large effects on the criminal justice system. To evaluate the effect of the legal reform on the judicial system, I use micro-level data on court cases and measures of judicial productivity to provide evidence on how the unfunded mandate hampered judicial productivity. I leverage a difference-in-differences analysis using a neighboring state as a control group due to shared geography and historical institutions. I find that the alcohol ban increased the demands on the justice system, decreased its efficacy and had no effect on its efficiency. I evaluate and rule out alternate explanations pertaining to judicial capacity, scheduling and priority changes. Finally, I write out plans for next steps to investigate mechanisms and sources of heterogeneity.

1 Introduction

Legal reforms have the potential to spur development (Rao 2020) - which explains the large push toward understanding what reforms work. While introducing and implementing good, appropriate policy measures to improve societal outcomes is important, factors like state's capacity can determine whether the desired outcomes are actually achieved. Thus, an act can be rendered illegal *de jure*, but failure in implementation would mean that it is still practiced *de facto*.

Legal reforms typically cause an increase workload of public actors. For instance, a program to address teacher absenteeism increases the workload of bureaucrats who

might need to monitor and sometimes physically confirm their attendance. Similarly, policies that involve a criminal penalty for offenders increase the workload of crime enforcement institutions - namely the police and the judiciary. Often, in developing countries, accompanying increases in their capacity to do this work are largely absent, thus the legal reforms take the form of 'unfunded mandates'.

In this paper, I assess the impact of increased workload due to a legal reform on the performance of the judiciary - an institution that remains important due to its large impact on individuals and the economy. I define judicial overload as a state wherein judges sare assigned much greater workload than they can carry out successfully given their responsibilities and resources. Further, I argue that legal reforms on account of unfunded mandates is a common instance wherein judicial workload is increased and depending on the magnitude and particularities in the clauses of the legal reform, can lead to judicial overload. Finally, increasing the workload of judges may increase or decrease the performance of courts depending on how we conceptualize measures of performance. I measure judicial performance separetely based on demand-side and supply-side performance measures. Particularly, I measure the supply-side performance by quantifying judicial efficiency, judicial efficacy and judicial quality.

I study these phenomenon by looking at the case of alcohol-ban in a large Indian state, using a difference-in-differences design. I leverage micro-level datasets on the judiciary and find that the ban on alcohol indeed increased workloads in the judiciary which was particularly driven by an increase in criminal cases. This led to large consequences on judicial performance - while the reform led to an increase in efficiency of judges, it also caused a decrease in efficacy. I argue that the decrease in efficacy is caused due to greater hearings on bail cases (which are taken up on priority) and due to judges assigning longer times to subsequent hearings. I also rule out a possible mechanism that this effect is driven by changes in judicial capacity.

In doing so, I show that legal reforms can result in public actors being overworked and overloaded and can have meaningful, unintended downstream consequences - and while I focus on a legal reform that considers the expansion of the criminal code, the theory and implications can be generalized to other public actors who may be assigned greater work than their capacity - typical in developing countries. Through my findings, I contribute to the literature of state capacity and judicial performance.

In the next section, I define judicial overload, situations that might increase workloads in the judiciary, its implications on the judicial system's performance and how scholars conceptualize (and measure) judicial performance. In section 3, I discuss the theoretical expectations. Section 4 discusses the background, context, and data while Section 5 lays

down the empirical strategy. I discuss results in Section 6 and mechanisms in Section 7, before concluding.

2 Judicial Overload

Overload can be defined as the feeling that one has too much to do in too little time, shared across professionals and managers today (Kelly and Moen 2020). In the authors' words, "Good jobs, previously characterized by relative autonomy and security, have become bad, with rising workloads, a sped-up pace, and escalating expectations that seem impossible to meet" (Kelly and Moen 2020).

Recent work has looked at the consequences of overworked employees - both on the individuals themselves and the organization at large. Workload can affect job performance (Siswanto et al. 2019; Janib et al. 2021; Bruggen 2015), job quality (Sherf, Venkataramani, and Gajendran 2019; Cox-Fuenzalida 2007) and the well-being of employees (Kokoroko and Sanda 2019; Elliott et al. 2014).

It is not clear how increasing workloads affect performance. While increasing workload increased the performance of bank employees (Siswanto et al. 2019), it was found to be negatively associated with academic staff's performance (Janib et al. 2021). On the other hand, a study of grocery workers found that there is an inverted U-shaped relationship between workload and performance - the output of employees increases up to a certain level, after which it decreases (Bruggen 2015). There can also be downstream costs - an increase in teachers' workload was found to reduce students' performance (Gwambombo 2013).

High workloads can also be thought to affect job quality. Managers who face high workloads (i.e., high amounts of work and time pressures) tend to prioritize other technical responsibilities over treating employees fairly (Sherf, Venkataramani, and Gajendran 2019).

Finally, high workloads can affect well-being. High workloads are also associated with higher levels of stress among nurses (Kokoroko and Sanda 2019) and also with higher levels of strain and lower levels of learning and motivation (Kubicek et al. 2022). At an organizational level, increased workload reduced efficiency in a hospital setting (Elliott et al. 2014).

On an individual level, the reasons for the ill-effects of increasing workloads have their roots in psychology. Studies have shown that a sudden increase or a sudden decrease in work leads to a loss in accuracy and slowing of response time (Cox-Fuenzalida 2007). This also applies to conditions where workers are performing two tasks at once (Cox-

Fuenzalida and Angie 2005), and the detrimental effects of increasing workloads are worse for individuals higher in neuroticism (Cox-Fuenzalida, Swickert, and Hittner 2004).

Building on the previous literature, I define overload as a condition in which workers are assigned a much greater work load than they can realistically carry out given their responsibilities. In this condition, workers may be tasked with highly demanding activities, however, may be under-equipped to adequately carry out their jobs in comparison to the demands placed on them.

2.1 Increasing Workloads in Judiciaries

Before discussing the effects of overload on judicial actors, we must first understand whether overloads happen in the judiciary. One common cause of overloads of public institutions is the phenomenon of unfunded mandates - basically any responsibility devolved to a public institution which is not accompanied by necessary resources to fulfill it (Rodr'ıguez-Pose and Vidal-Bover 2022). Unfunded mandates has been commonly studied in federalist systems - wherein higher levels of government mandate costly functions on lower levels without providing financial support. Such mandates have been found to affect the fiscal structure of states (Ross 2018).

Indeed this was a common phenomenon in the United States, which put in place the "Unfunded Mandates Reform Act" in 1995 to avoid the federal shifting of costs to state or local government, however, in practice, states have called out the costs associated with unfunded federal mandates as recently as 2016 (Ross 2018). In fact, at least 18 states have amended their constitutions or enacted laws to limit the states ability to issue such unfunded mandates (Ross 2018).

Unfunded mandates are not unique to the United States - and indeed, may be a common outcome of the decentralization process, as argued by Rodr'ıguez-Pose and Vidal-Bover (2022)[1]. This phenomenon is observed in other countries as well, although by different names. It is referred to as "cost-shifting" in Australia and "service responsibility downloading" in Canada, while in the United States and South Africa, it is referred to as "unfunded mandates" (Basdeo 2012).

While the idea of unfunded mandates has been previously applied to mandates given *across* levels of government (typically in federalist systems), I argue that unfunded mandates can also be directed *between* horizontal government agencies - wherein one branch increases the work of another branch, without concurrent increases in funding. I study a phenomenon

[1]Particularly, they operationalize the idea through a "relative index of unfunded mandates", which is a difference between the values of political and fiscal decentralization

of horizontal unfunded mandates - wherein the legislatures can increase the work of allied state institutions.

Such a situation would be more common in places with low state capacity. An instance of this can be when legislatures introduce complex laws that the state may or may not have the capacity to implement due to the relative weakness of its allied institutions. For instance, the legislature may pass a new law that criminalizes previously non-criminal behavior. This introduces a new category of crime, that affects the workload of law enforcement agencies. Both the police and the courts experience greater workloads on account of this - the case I evaluate in this paper.

2.2 Why overload affects judicial performance

Overload can affect judicial performance. Courtrooms are stressful places, and indeed there are several reasons why the demands placed on judges today are only increasing. For instance, the evolving institutional and societal environment require judges to constantly learn and adapt. The complexities of the modern legal codes only add to their work.

Active judges are likely to face numerous work-related experiences (e.g., traumatic cases) that affect the performance of their occupational duties (Chamberlain and Miller 2009). Judges are susceptible to occupational stress and are overly concerned about safety (Flores et al. 2007). Since increased workload is associated with increased stress, overload would indeed affect judges and their performance.

These stresses arise from a number of factors. First, judges primarily (but not exclusively) engage in highly specialized and cognitively demanding activities that have additional administrative responsibilities on top of the caseload (Gunawardena, O'Donnell, and Williamson 2019). Typically in developing countries, there is a huge backlog of cases that keeps judges constantly working with limited resources and capacity to decrease this backlog. Large backlogs may lead to difficult and unrealistic targets set by their seniors, further adding to the stress experienced by judges. The shortage of staff and human resources only aggravates this issue. Additionally, judges also encounter political interference, especially in cases involving high stakes. Politicians use the bait of transfers, promotions, and post-retirement positions to make judges comply (Aney, Dam, and Ko 2021).

This has indeed been the case for bureaucrats. Local bureaucrats are often under-resourced, and instead of focusing on their co-ordinating role, managers spend more time firefighting and on particularistic tasks, than on long-term planning and execution (Dasgupta and Kapur 2020). Given that bureaucrats have limited physical and mental resources, the state

of "overload" affects bureacratic performance - since they are unable to execute projects effectively due to rationing their time in sub-optimal ways.

What can be the effects of such increasing demands on judges? Increasing workloads can affect the performance of judges in a number of ways - this reduces the time available to write judgments (Gunawardena, O'Donnell, and Williamson 2019), can affect decision-making (Rachlinski and Wistrich 2017) and have psychological costs. This is all dependent on how we conceptualize and measure 'judicial performance'. In the following section, I unpack this concept into its core components, and evaluate how increasing workloads would affect each of them.

2.3 Understanding Judicial Performance

The performance of a country's judiciary is important for a number of outcomes: spanning the protection of rights and liberties of citizens, to the enforcement of contracts for private firms that can spur economic growth. Thus, understanding and analyzing judicial performance remains important to assess its appropriate functioning and understand how an increasing workload might affect the justice system. There are different dimensions of evaluating performance of the institution, and can take the following forms (Staats, Bowler, and Hiskey 2005):

(1) independence of courts: that courts are outside the influence of powerful social and political actors
(2) efficiency: which is related to maximizing outputs given a set of inputs
(3) accessibility: of all parties (litigants) to the judicial system irrespective of their social standing
(4) degree of accountability: to the written law
(5) effectiveness: which determines the degree to which decisions are made and enforced in a timely manner.

These dimensions are not necessarily correlated, and in fact, there could be tradeoffs: maximizing performance in one dimension may come at the cost of performance in another dimension. This may manifest even in closely related dimensions like efficiency and effectiveness.

While efficiency views judicial activity as a production process that involves producing maximum output given an input, efficacy concerns the ability of a judicial system to match the demands of justice (i.e. solving cases promptly). An efficient judiciary may not necessarily be effective: slow judiciaries may be able to use their resources more efficiently, or fast judiciaries may be inefficiently using their resources (Marciano, Melcarne, and

Ramello 2019).

Accountability to the law, or judicial quality, remains an important parameter to assess judicial performance. The quality dimension considers the "correctness" of the decisions and outcomes of the judiciary at an individual or systemic level. In this view, a high-performing court solves cases correctly and is thus able to state the truth through its decisions (Zuckerman, Chiarloni, and Gottwald 1999).

Judicial quality may be antithetical to an effective judiciary - a fast (and thus effective) court could fail to enforce contracts and protect property rights, so there may be a tradeoff between speed and quality. "Better" judiciaries may be more "bound" to legal frameworks and make them slow and ineffective (Voigt 2012).

Some work tries to settle these questions by using the World Bank's Rule of Law and Judicial Quality index to proxy for qualitative and quantitative dimensions of justice, which finds that slow and inefficient judiciaries are also the ones experiencing poor qualitative indices (Marciano, Melcarne, and Ramello 2019).

Additionally, increased workloads can also affect demands for justice - as private litigants observe large demand increases on courts they cannot meet, the tendency to get involved in litigation decreases. Thus, the demands for justice and the supply of justice (in the form of judicial efficiency, judicial efficacy and judicial quality) are all dimensions of performance that can be affected by increased workloads. I evaluate each dimension in turn, as I lay out the hypotheses for this paper.

As discussed in the previous section, criminalizing formerly "legal" behaviors places additional burdens on law enforcement and judicial systems. In other words, the designation of a new crime form will increase the breadth of criminal activities that need to be regulated, redressed and punished by the state. This, in turn, affects judicial performance, given the addition of workload. First, I lay down how different actors - the state, accused individuals, private litigants as well as judges - would respond, and how these affect the demand and supply for justice.

3 Theoretical Expectations

3.1 Demands for 'Justice'

The State: Since the state has created an additional criterion for offenders to be tried and punished, the legal reform increases the number of criminal cases filed in courts[2].

Individuals accused under new law: As the state goes after offenders of the new law, individuals who are accused under the law may file for bail (if they can afford it) until they are either convicted or acquitted. We thus would expect to see a rise in bail petitions.

Litigants: As litigants observe large demand increases on courts they cannot meet, the tendency to get involved in litigation decreases. This may be reflected as a decrease in new cases filed in the case wherein both parties (defendants and plaintiffs) are individuals.

3.2 Supply of 'Justice'

Earlier work has shown that overloaded bureaucrats ration their time in sub-optimal ways, spending a lot more time on particularistic activities (like responding to complaints and requests from citizens or politicians) than on managerial tasks, resulting in a sub-optimal use of their limited time (Dasgupta and Kapur 2020). I extend this theory to how performance of judges is affected under workload increases. My main hypothesis is derived from earlier work that shows that such workload increases can lead to sub-optimality - that is, overload worsens a judge's performance. As discussed in the previous section, the performance of judges can be conceptualized in a number of ways, in the form of efficiency, efficacy and quality. I evaluate my expectations for each of these in turn.

Effects on Efficiency: Cases heard per day

Judges actively participate in scheduling hearings for new and existing cases. While deciding which cases are to be heard, judges must consider both the formal rules on case timelines - for instance, cases regarding bail need to be taken up immediately as they concern individual liberties. Judges may also consider their performance incentives - the metrics based on which their performance is evaluated by their superiors - while deciding which cases to hear.

While dealing with an increased workload, judges can respond by hearing more cases daily. Since the capacity to hear cases (the hours they can work during a day) remains the same, they will respond by hearing more cases in the same time. This could be seen as an

[2]This is assuming that there continues to be capacity with the actors who are in charge of case filings and are not refusing to take complaints

increase in efficiency - since a higher number of hearings are conducted using the same amount of resources. On the other hand, overload can also lead to judges experiencing greater fatigue, thereby reducing their overall efficiency. Thus it is unclear whether and how increasing workloads of judges would affect their efficiency.

Decreasing Efficacy: Average time to resolve a case

A naive way to improve efficiency is prioritizing "simpler" cases over more "complex" ones. This is plausible since judges take an active role in case assignment and scheduling. In some US states, judges delegate the day-to-day responsibility to administrative or clerk's office personnel (Ostrom et al. 2020)[3]. So there is discretion on what is a "priority" case.

Thus, even if judges hearing were hearing more cases per day, the nature of the cases heard is the ones that could be resolved relatively quickly. This comes at the cost of hearing the more complex cases that require more time and coordination of various agencies to move to a resolution. This would decrease the efficacy of the judicial system by affecting the overall pendency of cases.

Decreasing Quality: Judicial Bias and Quality of Writing

In light of the increased daily workload, judges' decision-making would incorporate societal biases to a greater extent. Previous work finds that under stress conditions we observe changes in judges' "objective" evaluation of cases - that the sequential choices deplete mental resources (Pocheptsova et al. 2009; Simon 1955). This can be seen if there are changes in outcomes for in-group litigants as opposed to out-group litigants. Further, there may be less time available for judges to perform high-quality work, and one observable implication may be that the decrease in quality of their written decisions.

3.3 Downstream Effects due to decreasing Efficacy

As discussed before, faced with an increase in caseload, judges hear different types of cases than before. This changes the nature of cases heard daily - with simpler and urgent case types being prioritized over complex and less urgent case types. I identify two types of cases that may be complex or less urgent, and evaluate treatment effect heterogeneity on both:

Property-related disputes - as a result of the reform, the probability of a property-related dispute being on the daily roster of a judge decreases, given that it is a "complex" issue.

[3]For instance, each chief judge in the the Iowa Court system is assisted by a district court administrator, who handles the day to day responsibility of managing the case scheduling ("Guide to Iowa's Court System," n.d.)

We thus see increases in pendency for property-related disputes. This leads to insecure property rights, and we would expect property investment decisions and the market for tenancies and land sales to be affected due to the reform.

Contract disputes: as a result of the reform, the probability of a contract dispute being on the daily roster of a judge decreases, given that it is a "non-urgent" issue. We would consequently observe an increase in pendency for contract disputes. This has serious downstream consequences in the economy - wherein the recovery of loans would become difficult, which would lead to reduced circulation of loans and increases in interest rates charged for loans.

4 Background

4.1 Judiciary in India

The Supreme Court is at the apex level of the Indian Judiciary, often touted as the 'most powerful judiciary in the world'. Further, there are 24 High Court (encompassing states or larger regions), and typically, each district has a District and Sessions Court. Further, subordinate courts report to the District Court, which hear both civil and criminal cases. Judges are recruited based on their performance in competitive judicial examinations and directly from the bar - the norms for which vary across states.

At any point in time, a judge in India hears either civil or criminal cases. District court civil judges prepare a cause list (a list of cases to be heard in a day) with about 30 cases, while criminal judges can hear upto 80 cases daily. The justice system in India is plagued with low capacity - there are 20 authorized judge positions per million - however, this number is much lower once vacancies are accounted for (Rao 2022). This is a fifth and a tenth of the positions as compared to the US and UK, respectively. Rao explains:

"The total number of judge posts and judge recruitment drives in a district are determined jointly by the respective state high court and the state-level executive (through budget allocation) There is no clear rule on how the number of judge posts are revised over time, and periodic reports by the Law Commission of India, an executive body under the central government Ministry of Law and Justice (particularly, the Law Commission Report No.245) point out that this is relatively ad hoc without any specific calculus. Typically, the numbers are determined at the time of setting up a court's physical infrastructure, which happens once every few decades (mainly at the time of district formation)."

Thus the capacity of courts is not frequently revised, and thus courts are not often equipped

to cope with increased workloads due to legal reforms. In the following section, I introduce one such legal reform that increased court workloads, which I will further use in the research design.

4.2 Legal Reform: Alcohol Ban

Long considered a societal vice, alcoholism is a medical condition wherein a person cannot control their alcohol use and consumption - with adverse social, occupational, or health consequences. Higher rates of alcoholism have been associated with an increase in crimes (road traffic accidents, domestic violence, other violent acts), greater mental and physical health problems (suicide, heart disease, etc.), and higher unemployment (due to absenteeism). One of the big issues with alcohol is its strong relationship with intimate partner violence (Cafferky et al. 2018).

While alcohol sale forms a large base of excise revenue, several Indian states have instituted varying levels of alcohol prohibition to combat the issues associated with alcoholism - particularly those pertaining to its effects on domestic violence. And not without reason - a relationship exists between alcohol consumption and women reporting domestic violence (Kumar and Prakash 2016). Alcohol prohibition in Indian states typically targets the manufacturing, sale and consumption of liquor within state borders (Dar and Sahay 2018). The latest state to pass such a reform was Bihar, one of India's poorest state.

Since 2005, the state of Bihar has been led by Chief Minister Nitish Kumar at the helm. During the Bihar State Assembly Elections in 2015, the incumbent Chief Minister announced a plan to ban alcohol consumption in the state if he were re-elected, citing the prevalence of alcoholism and domestic violence in the state. After winning the election, he kept his election promise by passing legislation to this effect, despite bearing heavy losses in excise revenues. The prohibition law was passed in April 2016, which banned the manufacture, sale and consumption of liquor within the state borders. Further, stringent jail terms and fines were stipulated for offenders.

Earlier work studying alcohol prohibition policies in developing countries has found that such bans are associated with lower levels of domestic violence (Luca, Owens, and Sharma 2015), and indeed in Bihar, the ban led to a lower reporting of sexual assault and harassment against women (Khurana and Mahajan 2022). A. Roy (2020) finds that alcohol bans across Indian states reduced certain kinds of crime, and Suryanarayana et al. (2023) find the same impact in the case of the alcohol ban in Bihar - particularly, they find that the ban reduced the reported incidence of violent crime[4].

[4]It is not clear if this is actual crime, since the amount of recorded crime could decrease because police

According to Suryanarayana et al. (2023), the main mechanism driving the decrease in crime post the alcohol ban is the increase in police capacity during the ban[5]. However, no such increase in judicial capacity was made during the period to handle the increasing work load. Thus, the alcohol ban is an appropriate setting to study the effects of reform-induced increasing workloads on performance of the judiciary.

4.3 Data

The main data used in the paper is the universe of all digitized cases in the Indian District courts. The case-level data comes from the eCourts project in India, which undertook large scale digitization of Indian courts. As a result of this initiative, court cases in district courts (the lowest level of the judiciary) have been digitized and uploaded online, including data on the nature of the case, litigators, lawyers and judges who heard the case, and the timeline and outcomes. I start with assembling detailed case-level data by scraping individual case records for all cases filed in the lower courts in Bihar and Jharkhand to augment the data collected by Ash et al. (2025). For additional analyses and mechanisms, I use the National Family and Health Surveys of India and collect data pertaining to judicial capacity using the public profiles of judges serving in the Bihar and Jharkhand District Courts.

5 Empirical Strategy

Our main goal is to estimate the causal effect of the alcohol ban on outcomes related to judicial productivity. The main hypothesis is that the alcohol ban *worsened* outcomes related to judicial productivity. The target estimand is the difference between judicial productivity of a court in which the alcohol ban is implemented and the judicial productivity of a court had the policy *not* been implemented. In this scenario, each court has two potential outcomes: productivity under the alcohol ban and productivity for the court had there been no alcohol ban. Only of of them is observed, since we do not know what would have happened to the productivity in courts had there been no alcohol ban. One natural way to conduct such an analysis is to leverage a difference-in-differences design. In difference-in-differences, we use the data from a control group to impute untreated outcomes in the treated group. In other words, using the control group helps us learn about the unobserved

were occupied elsewhere. That is, inspite of an increase in police capacity (as the paper argues), there could be a re-allocation of tasks within the police force which takes capacity away from crime registration. The authors argue it is the former (that is, the ban reduced actual crime) by showing that there is a larger decline in interior districts in Bihar, which were also districts with high baseline alcohol consumption.

[5]Figures 8 and 9, (Suryanarayana et al. 2023)

Table 1: Comparing Bihar and Jharkhand

	Bihar	Jharkhand
Land Area	79,714 sq. km.	94,163 sq. km.
Capital	Patna	Ranchi
Districts	37	18
Population (in millions)	82	26
Sex-Ratio (2001)	921	941
Deccadal Growth Rate - Population (91-01) (%)	28.43	23.19
Population Density (2001)	880	338
Percentage Literacy (%)	47	54
Percentage Female Literacy (%)	33	39
% Hindu	82	68
% Sarnaism (Indigenous Religion)	1	13
% Scheduled Castes	16	12
% Scheduled Tribes	1	26

Note: This table compares characteristics of Bihar and Jharkhand, which are largely similar. Jharkhand has a larger population of Scheduled Tribes and those who practice indigineous religions.

counterfactual.

The analysis compares courts in Bihar with courts in its neighboring state – Jharkhand. Jharkhand was carved out of the territories of Bihar in 2000. I use theory and empirical tests to demonstrate the appropriateness of the control group. The two states were a part of a combined orginal state before 2000 and share the same history, institutions, and geography. Indeed, Jharkhand has been leveraged as a suitable control group for Bihar in similar strategies used in several other papers (Dixit, Mukherjee, and Rajan 2023; Khan 2022; Muralidharan and Prakash 2017; Suryanarayana et al. 2023).

Bihar was reorganized in 2000 based on the demands from indigenous communities (Scheduled Tribes) over fifteen years (A. K. Roy 2000). As seen in Table 1, the demographics of Bihar and Jharkhand differ in a few ways - particularly, the population density and the cultural make up. Jharkhand has a much larger tribal population and a larger sex-ratio.

The key identifying assumption is that the change in outcomes from pre- to post in Jharkhand is a good proxy for the counterfactual change in untreated potential outcomes in Bihar. I argue this is the case since both the states were under the same institution (the Patna High Court) which was only divided in 2003. Thus, it is more appropriate to compare the judicial characteristics of Bihar and Jharkhand, in addition to the overall

comparisons made in Table 1. Judges used to be recruited from a common pool - and indeed many of these judges (who were recruited before the split) are still a part of the judicial service today. Further, all results include results from tests for the presence of trends in the pre-treatment period.

The estimand is the average treatment effect for the treated courts (ATT). I use `FeCT` - particularly, the *Two-way Fixed Effects Counterfacutal* to make counterfactual predictions (Liu et al. 2022) for courts that do not experience the alcohol ban. The counterfactual estimator is one in which $Y_{it}(0)$ (that is, the outcome Y for court i at time t without treatment) is imputed based on a two way fixed effects model:

$$Y_{it}(0) = \mathbf{X}_{it}^{\intercal}\beta + \alpha_i + \eta_t + \epsilon_{it} \tag{1}$$

The `FeCT` estimator is preferred to the standard difference-in-differences estimator as it is better equipped to address weighting issues in panel treatment structure and is more reliable in the presence of heterogeneous treatment effects (Liu et al. 2022).

6 Results

6.1 Effect of Alcohol ban on alcohol consumption

I first use data from the National Family and Health Survey to show that while the alcohol ban decreased alcohol consumption, it did not completely eliminate it. I focus the analysis only for men, since women's consumption of alcohol in Bihar is less than 2%. From Table 2, we see that while the alcohol consumption in Bihar for men was about 30% before the ban, the ban reduces alcohol consumption among men in Bihar by 14%. This indicates that there still remain a considerable number of men who are potentially offenders and can be arrested. Further, the decrease of 14% is a ceiling effect, since the ban might be affecting people's reporting of alcohol-consumption as well. Respondents would be less likely to report illegal activity, hinting at a larger pool of offenders than estimated in the survey. All this points to a significant number of offenders who continue to consume alcohol post the state-wide ban, who can be arrested for violating the prohibition rule.

6.2 Effects of Alcohol Ban on Judiciary: Demands for Justice

As a new category of crime has been created, an overall increase in filings may be observed. On the other hand, as litigants observe large demand increases on courts that they are

	Alcohol Consumption
Treatment (Bihar)	-0.10^{***}
	(0.03)
Post (Alcohol Ban)	0.02
	(0.02)
DID (Treatment * Post)	-0.14^{***}
	(0.03)
Num. obs.	17550

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$.
Notes: Table 2 reports results estimating the effects of the alcohol ban on alcohol consumption for male respondents in the National Family Health Survey. Standard errors clustered by district

Table 2: Effect of Alcohol Ban on alcohol consumption

unable to meet, the tendency to get involved in litigation may decrease. Previous work shows that the alcohol ban increased crime in Bihar (Suryanarayana et al. 2023) and I test here whether the alcohol ban led to an increase in the number of case filings in the District and Sessions Courts.

Using the case-level data, we can observe whether the alcohol prohibition law increased the number of alcohol-ban related cases in courts. From the Figure 1 we see that the alcohol prohibition act led to an increase in filings in Bihar - and the cases due to the alcohol ban contributed between 6% and 13% of the total filings in a given year.

Importantly, the impact of the ban varied across court types. District and Sessions Courts were particularly affected by the ban - at its peak in 2017, over 20% of all filings in District and Sessions Courts were related to the Alcohol Prohibition. I thus limit my analysis to the District and Sessions Courts - which experienced the most overload.

I test this descriptive result more systematically using the `FeCT` estimator, with the number of filings as an outcome. The main finding from this analysis is that the number of filings increases in each year from 2016 to 2018. On average, the number of filings in the district and sessions court in Bihar increase by about 1386 cases in each court room for the post-treatment period, as seen in Figure 2.

A visual inspection of the trend does not show any change in outcome during the pre-treatment period. I perform two formal tests to test for presence of a pre-trend. The first test is a goodness-of-fit test (a variant of the F test) to understand if there are pre-treatment trends. The p-value of the F-test is close to 0.021 - a larger F-test p-value suggests a better pre-trend fitting, so we cannot conclude that `FeCT` method passes the F-test. Further, we can check if the 90% confidence intervals for the estimated ATTs in the pre-treatment period exceed an 'equivalence' range. Since a smaller p-value suggests better pre-trend

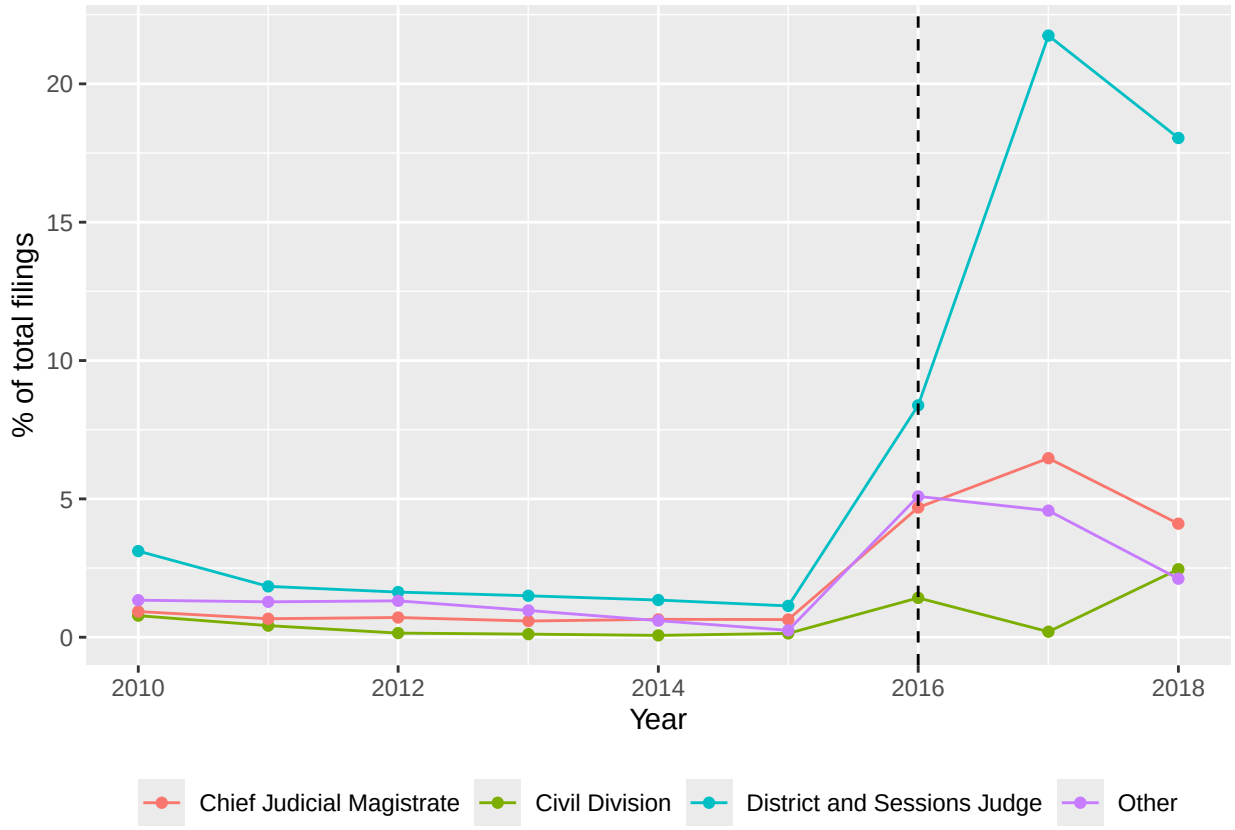

Figure 1: **Filings related to Alcohol Ban: by Court Type** Plots show the share of filings related to the alcohol ban. The left plot combines the data for all courts. The right plot has a separate legend for each court type. We see here that most of the cases related to the alcohol ban reform were filed in the district and sessions courts

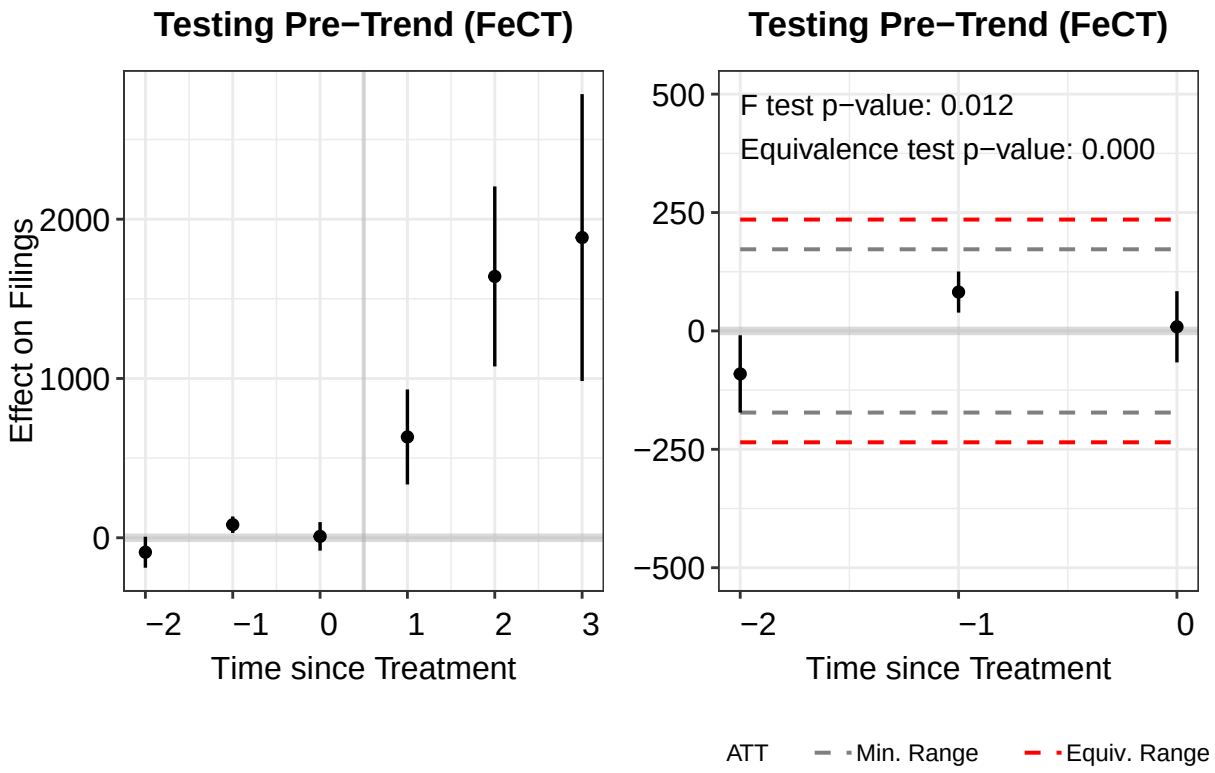

Figure 2: **Effects on Demand for Justice**. Left plot shows the dynamic treatment effect estimates for case filings before and after the alcohol ban. Bars denote the 95% confidence intervals from 200 bootstraps. Right plot shows the pre-treatment average prediction errors and 90% confidence interval. Red dashed lines denote the equivalence bounds. Black dashed lines mark the minimum range bound

fitting, we can say that FeCT passes the equivalence test (p-value is smaller than 0.000).

This is evidence that judges in Bihar indeed faced an overload condition - wherein they had to cope with increased workloads. I show that the increase in filings is driven particularly by criminal cases in the appendix, and I do not find evidence of a similar increase in the filing of civil litigation.

6.3 Effects of Alcohol Ban on Judiciary: Supply of Justice (Efficacy)

Our next empirical goal is to understand the effect of the alcohol ban on the supply of justice. I first look at whether the ban decreased efficacy of the justice system. I measure this by computing the probability that a case filed in a particular year will be decided in the same year. I exclude bail cases for this analysis since they are typically prioritized based on a principal of justice.

Recent work has shown that simple TWFE can be problematic due to (1) possible violations of parallel trends and (2) mistaken inferences due to treatment heterogeneity (Hassell and Holbein 2025). I check for any visual evidence of differential pre-treatment trends as per the advice in Hassell and Holbein (2025) by simply plotting the mean trend of our outcome measure in the pre-treatment period for both Jharkhand and Bihar. As seen in Figure 3, the treated and untreated courts are trending in a similar way before the treatment exposure. While this does not rule out possible violations of the parallel trends assumption, it increases our confidence in the design.

Next, I employ FeCT to estimate the counterfactual probability of decision had a court in Bihar not experienced the alcohol ban, $Y_{it}(0)$. The estimand of interest is the average treatment effect on the treated courts (ATT). The use of FeCT is driven by the rationale that we expect heterogeneous treatment effects over time - the effects of the alcohol ban on judicial productivity in the first year might be more muted than its effect in later years. The FeCT approach uses an imputation method to compute the unobserved potential outcomes.

This brings us to the main result in the analysis. Figure 4 plots the estimated effect of the alcohol ban on probability that the case is decided in the same year. In 2016, the year that the ban was imposed, we start seeing a decrease in the probability of decision in the same year. We see the largest decrease (in magnitude) in 2018.

I perform the same two tests as before for presence of a pre-trend. The p-value of the F-test is close to 0.6 - a larger F-test p-value suggests a better pre-trend fitting, we conclude that FeCT passes the F-test. Further, we can check if the 90% confidence intervals for the estimated ATTs in the pre-treatment period exceed an 'equivalence' range. Since the

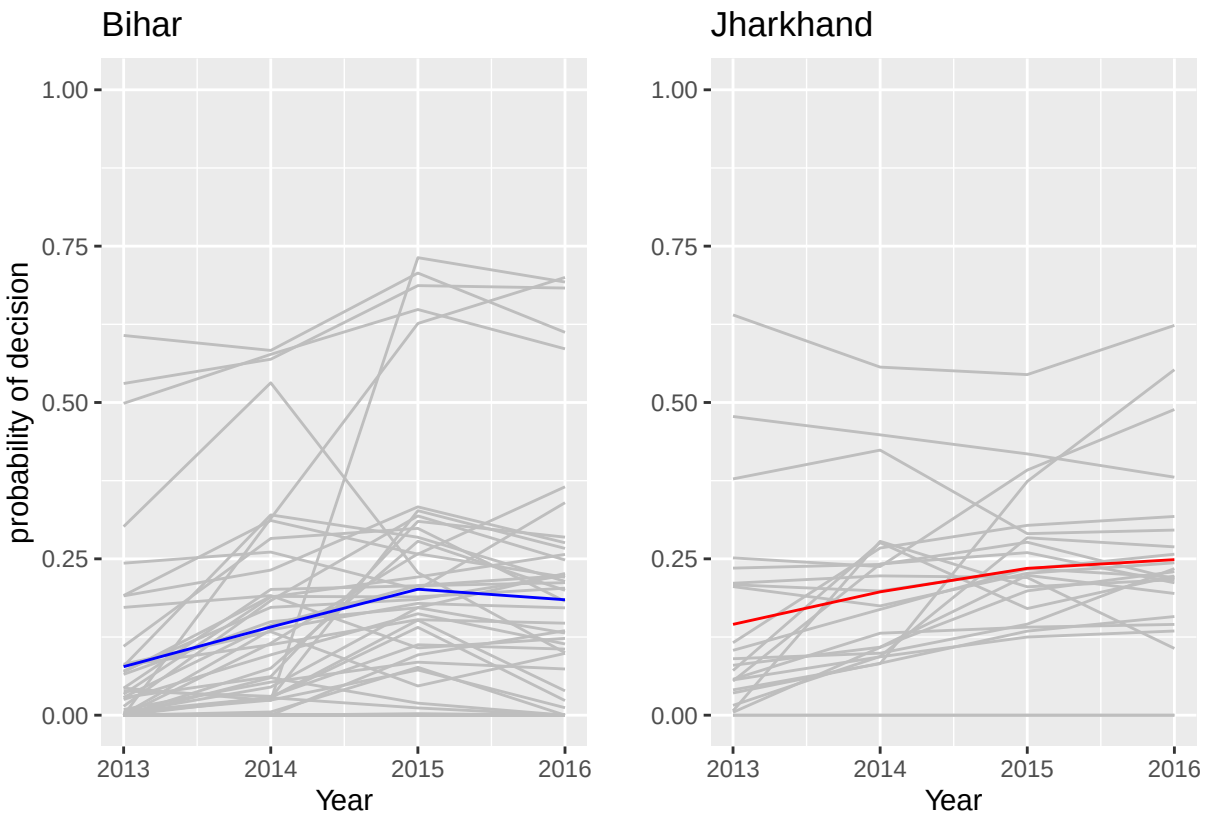

Figure 3: **Pre-treatment Trends** Plots show the probability of decision of cases in Bihar (left) and Jharkhand (right). Each grey line indicates a courtroom in the District and Sessions Court of the two states. The blue line indicates the mean trend of decision probability for Bihar. The red line indicates the mean trend of decision probability for Jharkhand.

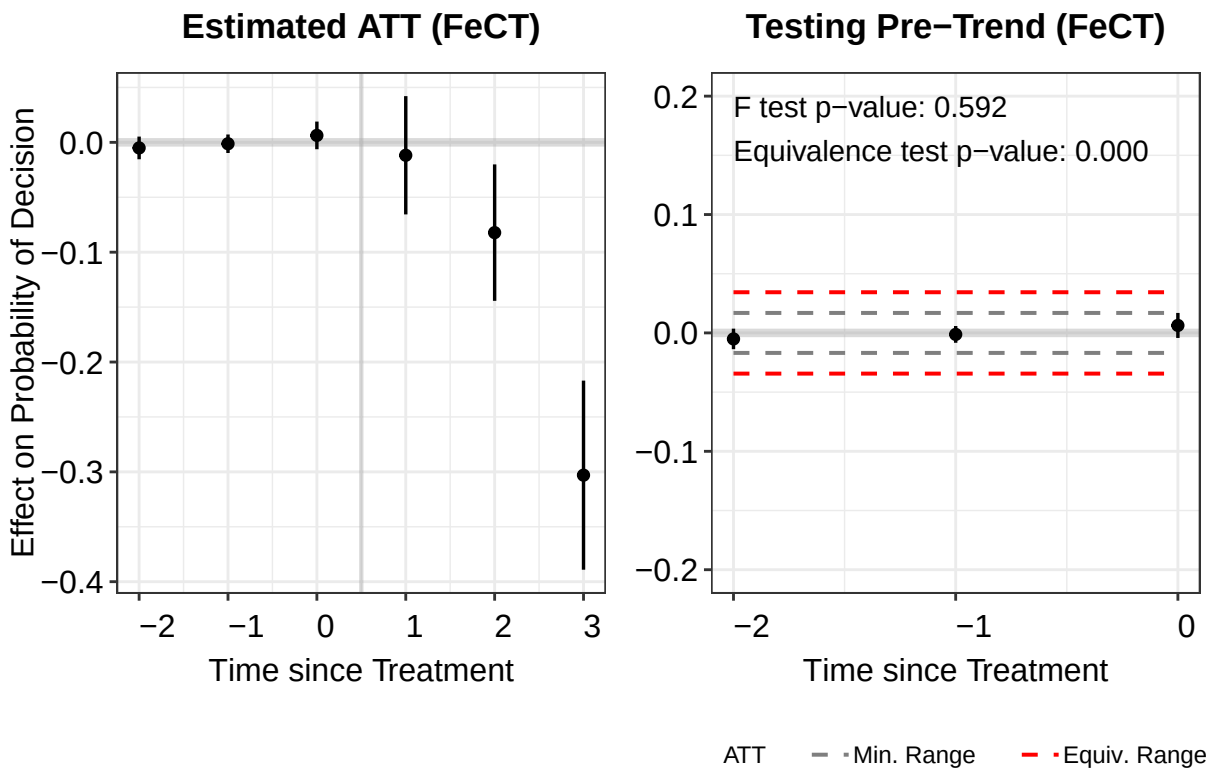

Figure 4: **Effects on Supply of Justice: Efficacy** Left plot shows the dynamic treatment effect estimates for probability of case decision before and after the alcohol ban. Bars denote the 95% confidence intervals from 200 bootstraps. Right plot shows the pre-treatment average prediction errors and 90% confidence interval. Red dashed lines denote the equivalence bounds. Black dashed lines mark the minimum range bound.

p-value is smaller than 0.001, the results pass the equivalence test. I conclude is that the alcohol ban decreases the probability of getting a decision in the same year in Bihar by 13%. This is a large effect and can have large downstream implications on the efficacy of the justice system in Bihar during this period.

6.4 Effects of Alcohol Ban on Judiciary: Supply of Justice (Efficiency)

Our final empirical goal is to understand the effect of the alcohol ban on the supply of justice - with respect to efficiency. I look at whether the ban increased the efficiency of judges post the ban. I measure this by computing the number of hearings per court conducted in a year in Figure 5. I do not find evidence that the alcohol ban affects the efficiency of judges.

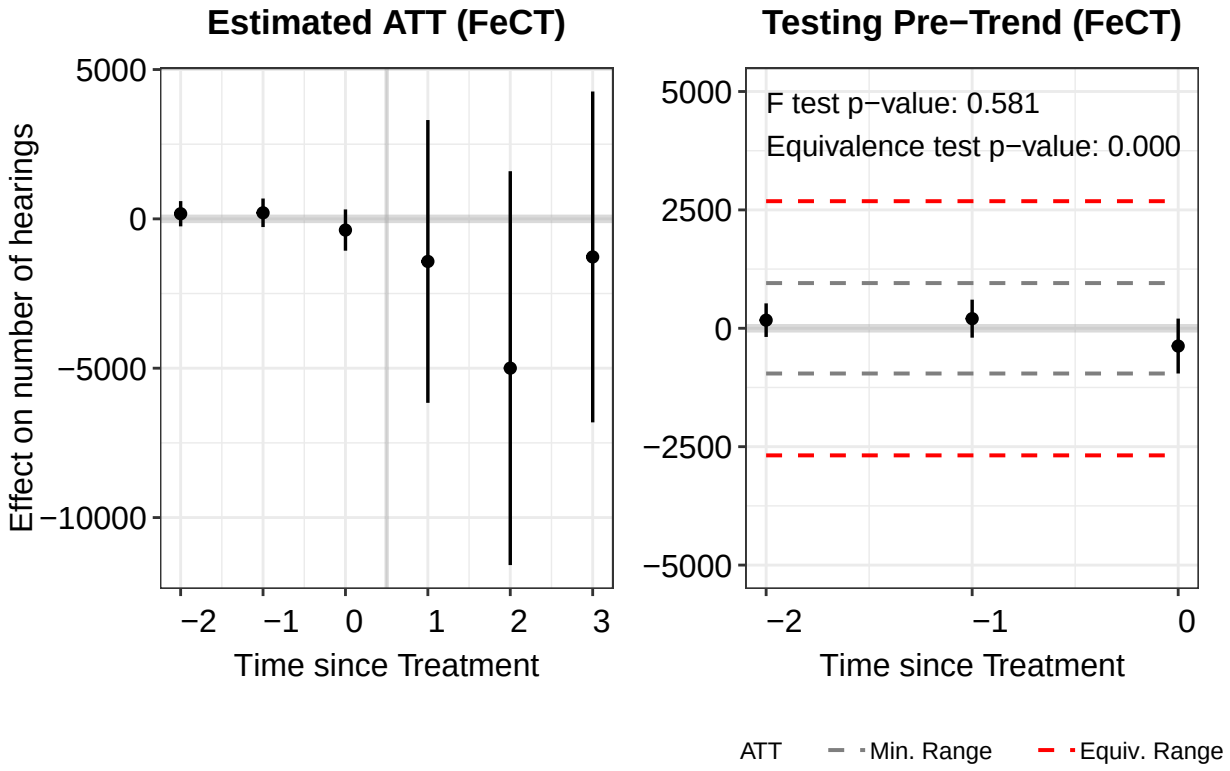

Figure 5: **Effects on Supply of Justice: Efficiency** Left plot shows the dynamic treatment effect estimates for the number of hearings conducted before and after the alcohol ban. Bars denote the 95% confidence intervals from 200 bootstraps. Right plot shows the pre-treatment average prediction errors and 90% confidence interval. Red dashed lines denote the equivalence bounds. Black dashed lines mark the minimum range bound.

7 Alternate Explanations

7.1 Changes in judicial capacity

Can the decrease in judicial productivity be explained by reduced judicial capacity? In order to rule out this mechanism, we construct a dataset of the number of all judges serving in the Bihar and Jharkhand judiciaries during each time period. We can see in Figure 6 that there is no evidence of an increase or decrease in judicial capacity Bihar. I rule this out as an alternate explanation.

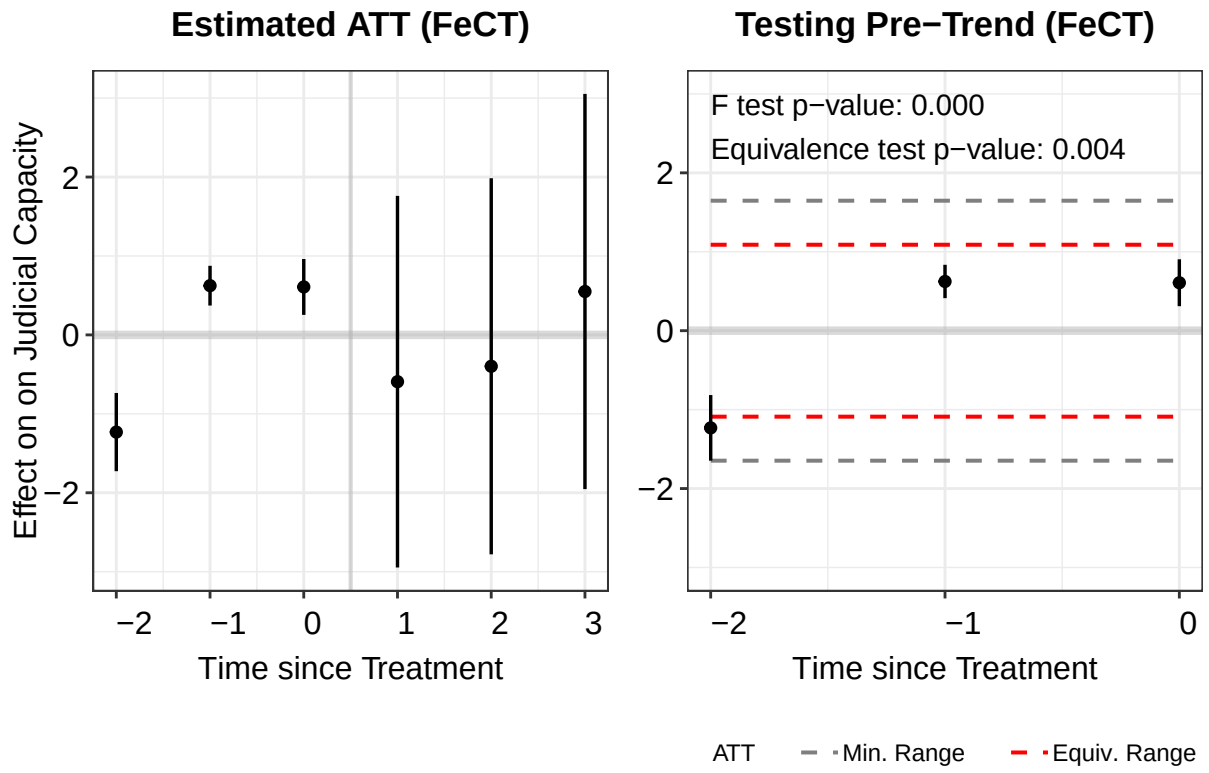

Figure 6: **Effects on Judicial Capacity** Left plot shows the dynamic treatment effect estimates for the judicial capacity before and after the alcohol ban. Bars denote the 95% confidence intervals from 200 bootstraps. Right plot shows the pre-treatment average prediction errors and 90% confidence interval. Red dashed lines denote the equivalence bounds. Black dashed lines mark the minimum range bound.

7.2 Scheduling changes: time to next hearing

One reason that cases could experience delays would be if judges are assigning longer periods between the current and next hearing. I find effects in the opposite direction as shown in Figure 7 - that the time to the next hearing decreases. However, this analysis

does not pass the equivalence test as shown in the figure. I rule out scheduling changes as a mechanism since it does not explain the reduction in judicial productivity.

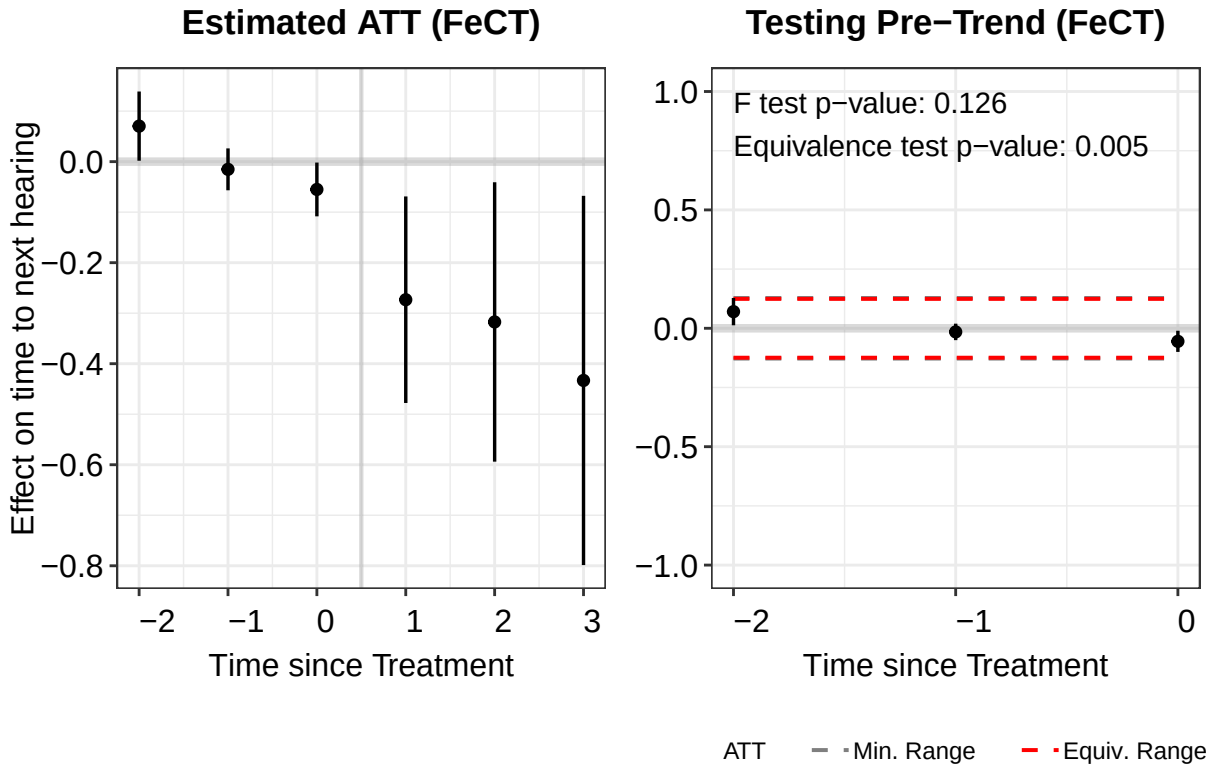

Figure 7: **Effects on scheduling** Left plot shows the dynamic treatment effect estimates for the mean time to next hearings conducted before and after the alcohol ban. Bars denote the 95% confidence intervals from 200 bootstraps. Right plot shows the pre-treatment average prediction errors and 90% confidence interval. Red dashed lines denote the equivalence bounds. Black dashed lines mark the minimum range bound.

8 Mechanisms and next steps

In this section, I discuss the main mechanisms that drive the decrease in efficacy of the judiciary post the alcohol-ban reform. Judges serving in courts where the reform is in place could be changing the mix of cases they are hearing. As their daily workloads increase, they may be prioritizing the hearings and decisions for bail cases (which are seen as more urgent) at the cost of other cases. This motivates an analysis of heterogeneous treatment effects based on case types. In order to conduct this, I compute separate outcomes for civil, criminal and bail cases for each court, and test whether the alcohol ban has a differential effect based on case types. This change in case mix is the main mechanism that can explain the decrease in judicial efficacy.

A final way that cases could experience delays and explain the lower decisions post the ban could be because judges find it harder to find time to write out the final decision for the case. To analyse this, I look at whether the alcohol ban affects the time between the final hearing and the date on which the decision is made. This might be suggestive evidence to show that it is the increased workload results in lesser time to write decisions, possibly hinting at a decrease in judicial quality.

Further, an important source of heterogeneity is the enforcement of the alcohol ban. There are two places where the alcohol ban would be most strongly enforced. First, in districts with a larger share of MLAs from the ruling party, and second, in districts that are more urban, and closer from the capitol. In order to evaluate this, I plan to create two new variables. First, I compute the share of ruling parties of MLAs in all districts, and present an analysis restricting the treatment districts to districts which had greater than 50% MLAs belonging to the ruling party. Second, I restrict the analysis only to urban and border districts to check whether the impact of the ban is different for rural, urban and border districts, based on the degree of enforcement.

9 Conclusion

In this paper, I evaluate the effects of a legal reform on judicial productivity – I study the effect that a state-wide alcohol ban had on the judicial system, that exemplifies legal reforms in developing countries, which face low state capacity to implement and impose their reforms, typically in the form of unfunded mandates. While literature focusing on unfunded mandates has largely focused on the US context when applied across government levels, this paper extends the idea to unfunded mandates that can be directed between horizontal government agencies, in this case, a law-making body increases the workload of the judicial system, without adequately increasing capacity to handle and perform the additional work. I lay down my theoretical expectations based upon measures of judicial performance - measuring the demands for justice and the supply of justice in the form of efficiency, efficacy and quality.

Leveraging a difference-in-differences design, I find that the alcohol ban indeed increases the workload of judges due to a large increase in filings. While there is no effect on the efficiency of judges (measured by the number of hearings conducted), the efficacy of the judicial system decreases, on account of decreasing the probability that a case would be decided in the same year that it was filed. While I am able to rule out alternate explanations pertaining to judicial capacity and changes in scheduling, I argue that the main mechanism that leads to the decrease in efficacy is due to the change in the daily case-mix – judges

prioritize cases that involve a bail request due to strong norms regarding their disposal, at the cost of other pending cases.

The paper makes three contributions across literatures in political science. First, I extend the theory on unfunded mandates to different branches of government. Second, I build on studies that look at the effects of increasing workload of public actors, and argue how unfunded mandates and expansion of criminal codes can create instances which increase workload of public actors with unintended downstream consequences. Finally, I leverage a credible research design to estimate effects of the alcohol ban on Indian courts, contributing to the growing literature in political science and economics on the Indian judicial system.

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