

Can AI Help Courts be Fair and Just?

**Unlocking the Positive Effects of Justice on Economic
Development**

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Roadmap

- ① AI to understand, diagnose, and address injustice
- ② **Economic impacts of judicial state capacity**
 - ① **Physical capital (digital infrastructure)**
 - ② Human capital (training)

AMICUS (Analytical Metrics for Informed Courtroom Understanding & Strategy)



We run law and development RCTs through relationships with government partners who link legal cases to downstream effects for individuals and firms.

Data Revolution



Ministarstvo pravosuđa
Republike Hrvatske

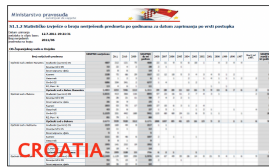
Table with multiple columns and rows of data, likely representing legal cases or court statistics.

CROATIA

Recent innovations have opened up new opportunities for delivery of justice

- ▶ Increasingly digitized large-scale datasets
- ▶ ML applications to produce interpretable data from unstructured text
- ▶ Predictive models of decision-making to better understand biases and address them with digital interfaces

Data Revolution



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CROATIA

Dashboard showing a large table of data for Croatia, with columns for various categories and rows for different entities.

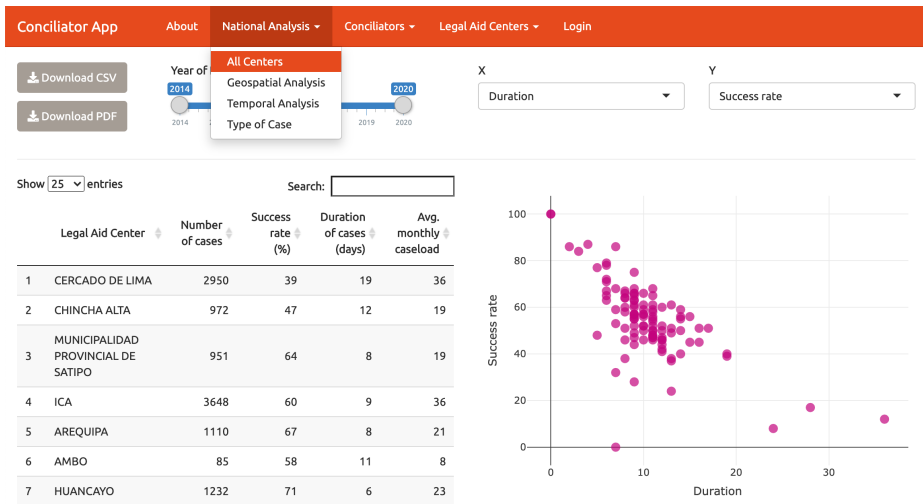
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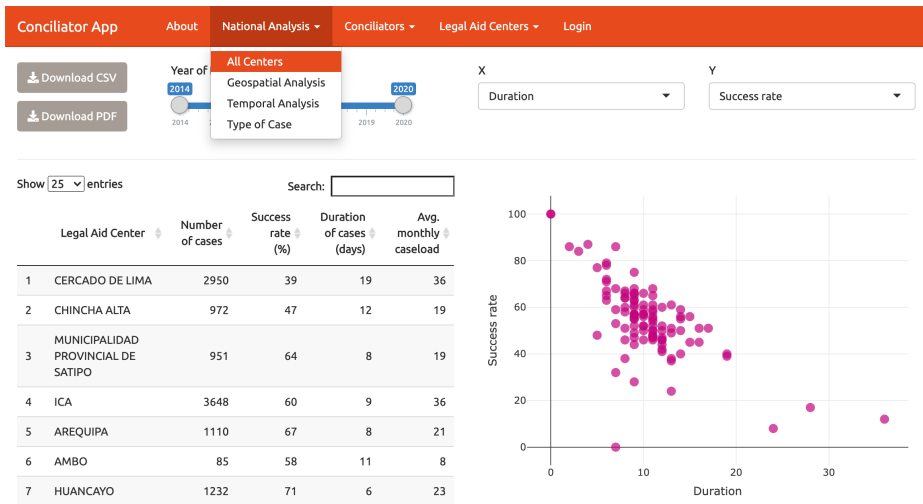
Recommending Actions to Each Other



oTreeJustice

OR, AS MANAGEMENT TOOL, OBSERVING REGRESSIONS THAT THEY RUN

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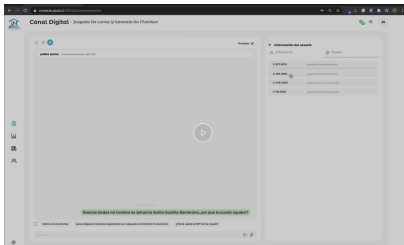


oTreeJustice

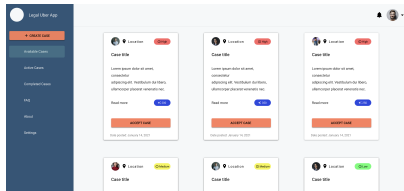
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E-Justice Innovations

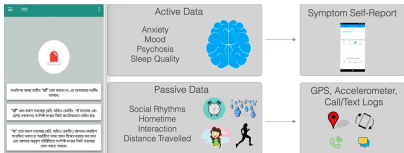
WhatsApp access to virtual courts



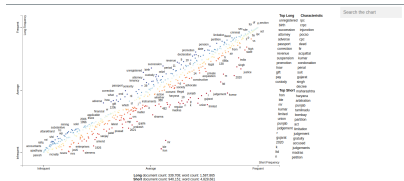
Uber-ization of case backlog



Apps for missing cases

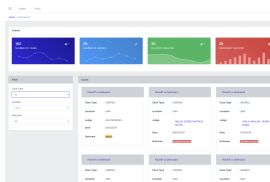


Open access legal search engines



Human-Centric

Personalized case-based teaching



Predicted self

Asylum Case Predictor

[Home](#) | [About](#)

State

Select a state

Attorney present?

☒ Yes ☐ No

Nationality

CHINA

Asylum type

☐ Defensive ☐ Affirmative

Case Type

- ☐ REMOVAL
- ☐ ASYLUM ONLY CASE
- ☐ DEPORTATION

Building Capacity

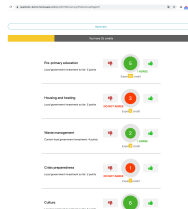
Open source no-code tools for

Data entry and decision-support

Understanding justice needs

Search

ID#	MAC No. 4	Name	Active	Age	Professional Memb...	Professional Qualifi...	Experience	Ph
Filter...	Filter...	706	Filter...	Filter...	Filter...	Filter...	Filter...	Filter...
DELETE	MAC0801-003	Alexa Fia	Yes	40	MTI, CMAS	BA Commerce	2 Year's	MA
DELETE	MAC0801-071	Eve Ste	Yes	20	MTI	UB, UUB	4 Year	LA



Learning best practices

Increasing recognition-respect

1.707761307189567 54057456 28894800 183333236

Login

0 100

Enter the third case type

TODAS

Describe the strategy you most used or found most useful (10 words or fewer)

How effective was this strategy toward reaching an agreement? (10 is the most effective)

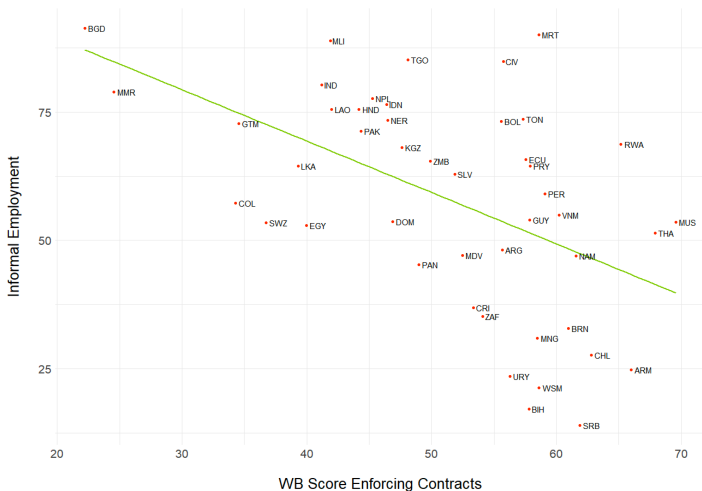
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Submit



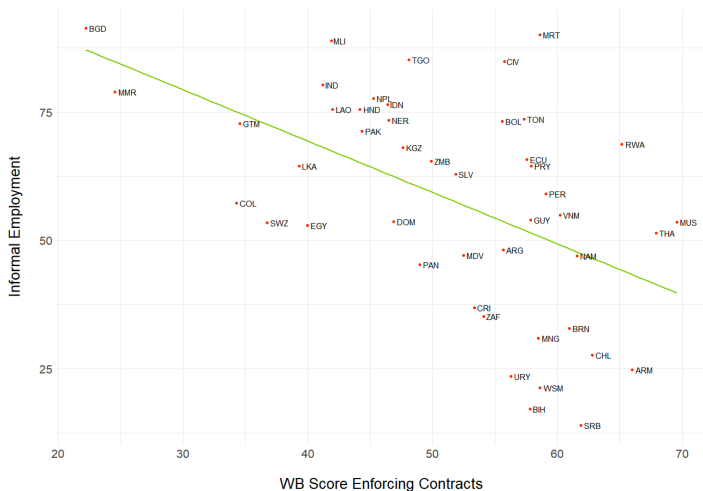
Chen, Schonger, and Wickens
J Behavioral & Experimental Finance 2016

Economic development & legal institutions are associated



A 20% decrease in case duration is associated with a 10% increase in GDP per capita (Penn World tables)

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“Endless adjournments of cases on frivolous grounds” are a major cause of case backlog (Chief Justice Maraga 2019)

- Nation-wide experiment using the first digitized daily court records
 - ▶ Developed an algorithm to identify the greatest source of court delays
 - ▶ T1: provide actionable information
 - ▶ T2: + accountability
 - ▶ Control: status quo (no information), RCT across all 124 court stations

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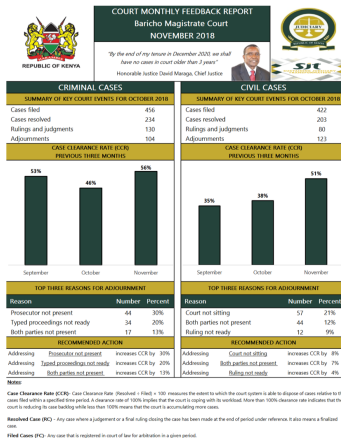
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Actionable Recommendations

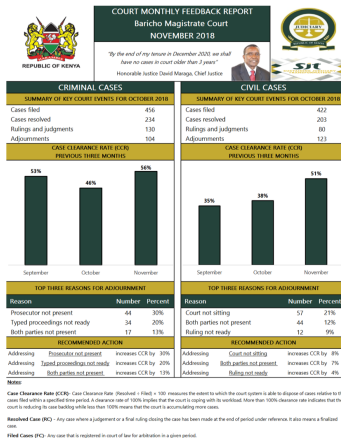


Can AI reduce information frictions

Improve the functioning of courts

Unlock the positive effects of justice on economic development?

Actionable Recommendations



Can AI reduce information frictions

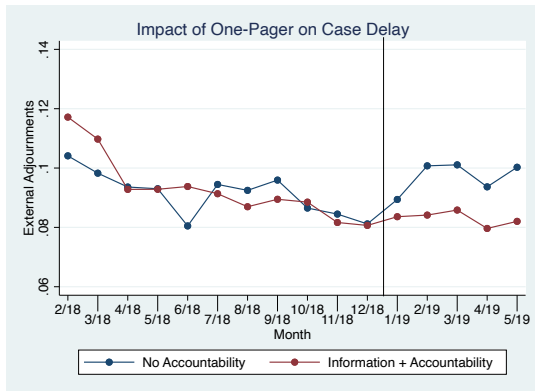
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Intervention

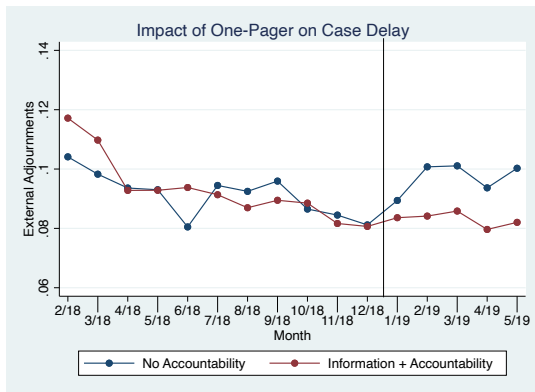
- First wave sent in February 2019
- Second set of waves from 2021-2023

Accountability reduced adjournments



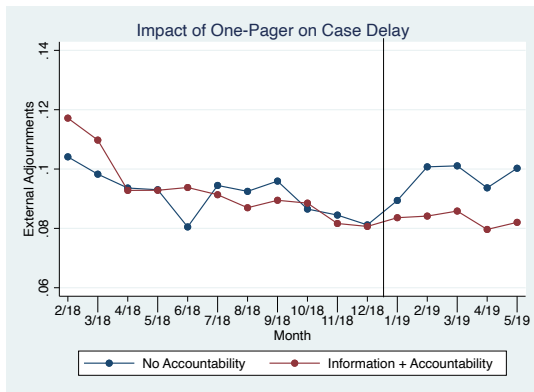
- Effect size suggests 20 percent impacts
- Compound effects: adjournments for another hearing
 - ▶ The mean number of hearings per case is 4.63
- Translates into a reduction of 107 days in trial length, or 22%

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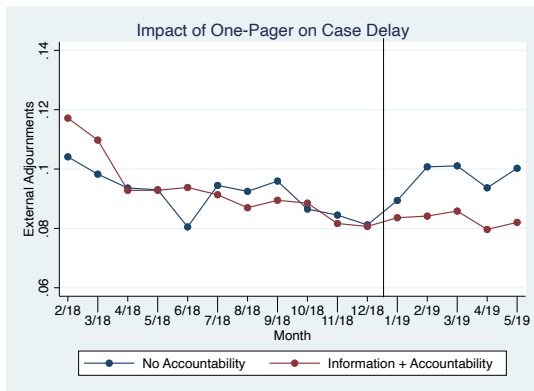
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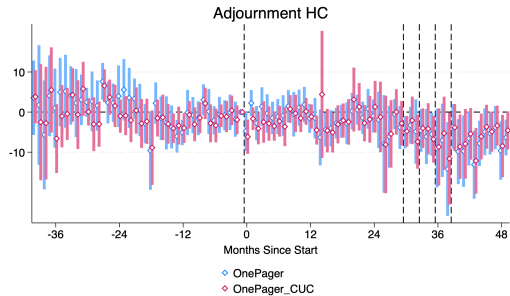
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The effects persist



Long-term impact

Elevating to 30% reduction in time to disposition over four years

	Time to Disposition	Commercial Cases Filed Per Day Per Court
OnePager * Post	-244.8* (135.4)	0.27 (0.17)
OnePager_CUC * Post	-322.4* (176.5)	0.41** (0.20)
Court FE	Yes	Yes
Day FE	Yes	Yes
Control Group mean	1103.6	0.61
SD	1481.6	2.36
Observations	183068	62883

along with an increase in access to justice

No adverse impacts of increased speed on proxies for quality

	(1) Judgement Length	(2) Cases in text	(3) Laws in text	(4) Number citations
OnePager * February 2019	-2.75 (160.75)	-0.87 (0.66)	0.23 (0.55)	-0.01 (0.09)
OnePager CUC * February 2019	-38.67 (179.62)	-0.07 (0.82)	0.06 (0.54)	-0.10 (0.10)
OnePager * March 2019	194.00 (142.12)	0.09 (0.38)	0.32 (0.50)	0.05 (0.05)
OnePager CUC * March 2019	107.30 (179.59)	0.54 (0.52)	0.67 (0.60)	0.22 (0.25)
OnePager * April 2019	186.91 (193.18)	0.73 (0.68)	0.56 (0.73)	0.13* (0.07)
OnePager CUC * April 2019	-29.20 (229.49)	0.89 (0.60)	0.49 (0.82)	-0.07 (0.09)
OnePager * May 2019	-4.81 (221.05)	-0.76 (0.67)	0.51 (0.69)	0.08 (0.07)
OnePager CUC * May 2019	-92.43 (236.63)	0.17 (0.78)	0.86 (0.80)	-0.11 (0.09)
OnePager * After June 2019	143.04 (151.46)	-0.04 (0.75)	0.36 (0.69)	0.08 (0.07)
OnePager CUC * After June 2019	70.80 (194.39)	0.82 (0.87)	0.07 (0.66)	-0.05 (0.09)
OnePager * Month Before	-4.36 (172.62)	0.24 (0.45)	-0.26 (0.72)	0.08 (0.07)
OnePager CUC * Month Before	206.14 (194.22)	1.45** (0.61)	0.35 (0.68)	0.14 (0.14)
Observations	137,376	137,376	137,376	137,231
R-squared	0.111	0.141	0.126	0.034
Mean Dep Var	2023	3.273	5.128	1.350
(SD)	2643	6.558	13.51	12.82

Speed of Justice & Citizen Satisfaction

What suggestions do you have for improving court facilities and services?

	(1) Judge neutral	(2) Judge led proceedings well	(3) Suggestion Speed	(4) Suggestion Quality
OnePager * 2019	0.04 (0.07)	0.00 (0.07)	-0.06* (0.03)	-0.06*** (0.02)
OnePager_CUC * 2019	-0.09 (0.07)	-0.04 (0.06)	-0.04 (0.04)	-0.05*** (0.02)
OnePager * 2015	0.29 (0.27)	0.33 (0.32)	-0.05 (0.03)	0.01 (0.04)
OnePager_CUC * 2015	0.26 (0.26)	0.31 (0.30)	-0.00 (0.03)	0.02 (0.04)
Observations	12,612	13,847	15,199	15,199
R-squared	0.875	0.903	0.227	0.176

We find a reduction in complaints about speed and quality.

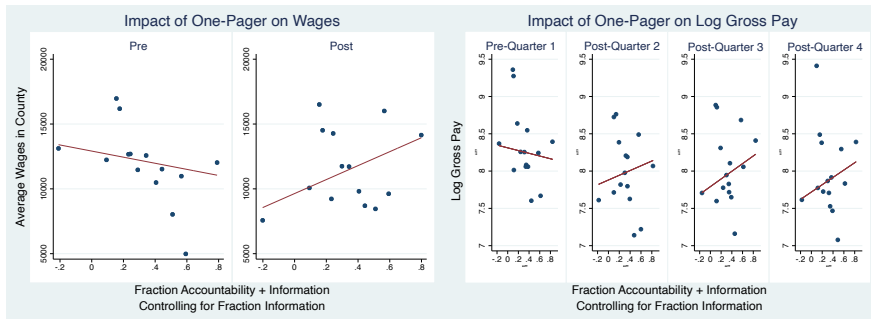
What is the long-term impact on trust?

Trust courts			
	All	Likely user	Not Likely user
OnePager * Wave 2	9.99* (5.34)	16.37** (6.35)	4.67 (6.55)
OnePager_CUC * Wave 2	4.41 (5.02)	3.28 (5.65)	5.31 (7.04)
OnePager * Wave 1	4.45 (5.89)	4.94 (6.66)	3.48 (6.43)
OnePager_CUC * Wave 1	1.33 (6.42)	-1.86 (6.82)	4.98 (7.27)
OnePager * Before	7.41 (6.69)	9.34 (7.60)	6.37 (7.25)
OnePager_CUC * Before	1.94 (6.19)	-1.79 (7.29)	5.93 (6.87)
Observations	9,315	4,791	4,484
County fixed effects	YES	YES	YES
Time FE	YES	YES	YES
Mean control group	55.78	54.50	57.62
SD control group	31.16	31	31.33

- Afrobarometer survey: “How much do you trust Courts of law?”
(0=Not at all, 1=Just a little, 2=Somewhat, 3=A lot).

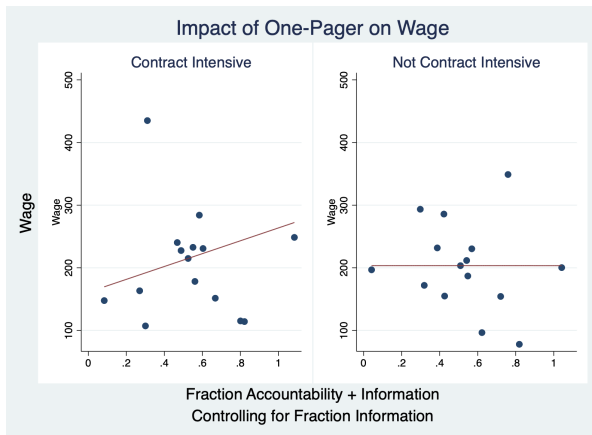
Speed of Justice & Economic Outcomes (VAT, KIHBS)

Kenya Continuous Household Survey measures wages, industry, contracts



Wages of individuals in the county is associated with proportion of treated court stations in a county

Contract Intensity



The effects are larger in industries that are contract-intensive (i.e., complex input mix and reliance on contract enforcement)

Increase in Formal Contracts

Robust to different trimming of the wages, or using the log of wages, or using other measures of wage

	(1) Wage	(2) Wage Trim 3 sd	(3) Log Wage	(4) Total Gross Pay	(5) Extensive Margin	(6) Written Contract
%OnePager*Post*CI	61.61 (46.95)	63.25 (45.94)	0.37 (0.32)	59.99 (59.51)	0.022 (0.033)	0.06** (0.03)
%OnePagerCUC*Post*CI	76.18** (34.96)	74.91** (35.45)	0.33* (0.18)	110.21* (57.14)	0.005 (0.026)	0.06** (0.03)
%OnePager*Post	52.40 (36.93)	45.80 (37.56)	0.26 (0.35)	69.39 (64.07)	0.016 (0.037)	0.02 (0.02)
%OnePagerCUC*Post	106.88** (44.29)	103.29** (44.23)	0.55 (0.35)	173.95** (67.44)	-0.008 (0.029)	0.04 (0.02)
Observations	6,857	6,827	6,857	3,574	34,887	34,154
County fixed effects	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES
CI	YES	YES	YES	YES	YES	YES
Mean control group	261	261	8.225	436.4	0.0921	0.143
SD control group	319.3	319.3	1.819	462.4	0.289	0.350

Individuals in the KCHSP are asked whether their labor contract is a written contract, a verbal agreement, an implied contract, or not a contract. We find more written contracts after the reform, which is indicative of citizens feeling more confident asking for contracts. (Kenyan Employment Act)

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Can digital platforms offering free legal information improve justice systems?

“bring knowledge of the law to the common people”

Keyword searches for automatic determination of most relevant clauses and judgments

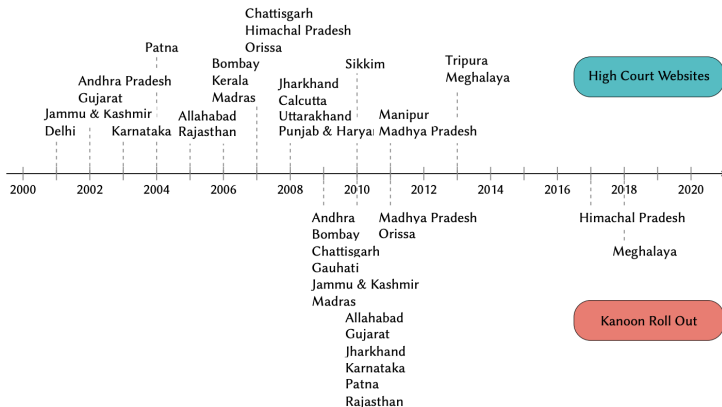


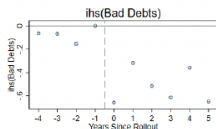
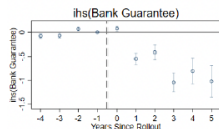
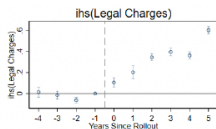
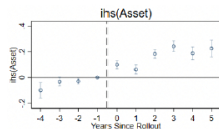
Figure: Roll Out Years for High Court Websites (top) and Kanoon (bottom)

Today, it is a “first-stop” for lawyers, 6 min per page, 2.9 M search queries and 1.5 M sessions per month

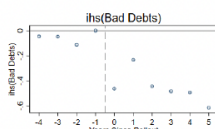
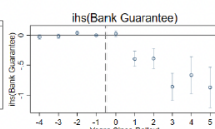
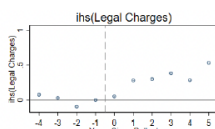
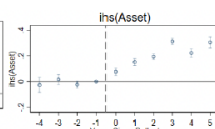
Event study analysis of firm financials

$$Y_{cfst} = \alpha + \sum_{j=2}^4 \beta_j (lag_j)_{cfst} + \sum_{k=1}^4 \gamma_k (lead_k)_{cfst} + \mu_s + \delta_f + \lambda_t + \epsilon_{cfst}$$

Firms with at least one case



General equilibrium



Sizeable impacts on assets and reduction of bad debt reinforce the findings of a 12% increase in employment in an RCT of free legal information to South African firms. (Bertrand and Crepon 2021)

Highlight the potential for open source / open access tools to be transformative for development

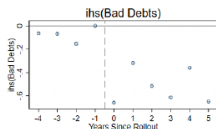
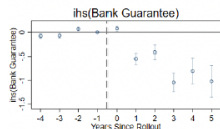
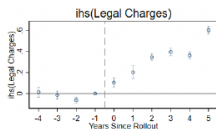
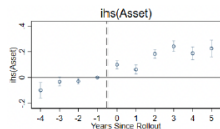
Impact of Free Legal Search on Rule of Law

WHAT IS THE IMPACT OF ACCESS TO JUSTICE?

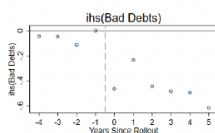
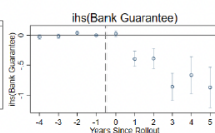
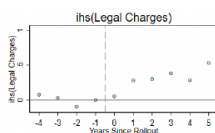
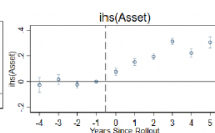
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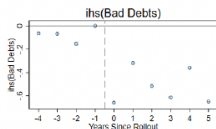
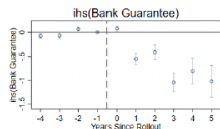
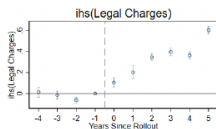
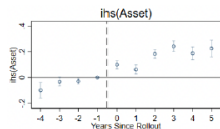
Impact of Free Legal Search on Rule of Law

WHAT IS THE IMPACT OF ACCESS TO JUSTICE?

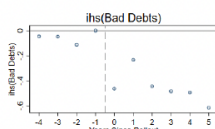
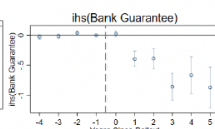
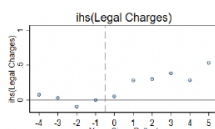
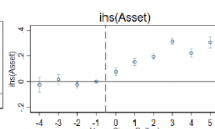
Event study analysis of firm financials

$$Y_{cfst} = \alpha + \sum_{j=2}^4 \beta_j (lag_j)_{cfst} + \sum_{k=1}^4 \gamma_k (lead_k)_{cfst} + \mu_s + \delta_f + \lambda_t + \epsilon_{cfst}$$

Firms with at least one case



General equilibrium



Sizeable impacts on assets and reduction of bad debt reinforce the findings of a 12% increase in employment in an RCT of free legal information to South African firms. (Bertrand and Crepon 2021)

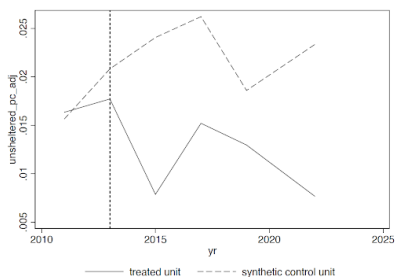
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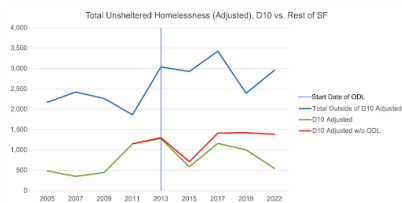
WHAT IS THE IMPACT OF ACCESS TO JUSTICE?

Access to Civil Justice

reduces homelessness



45% of “at risk” or currently homeless individuals were prevented from becoming homeless

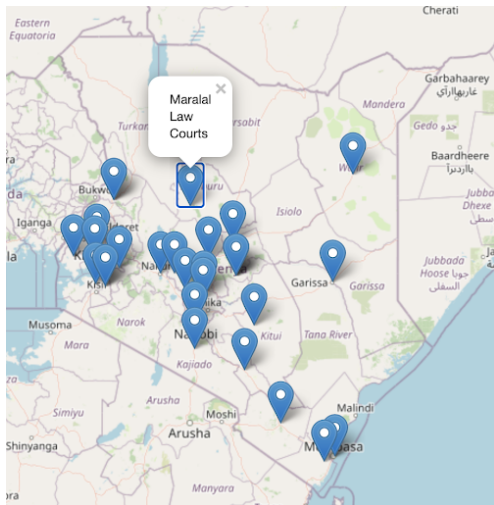


What Role Does Access to Civil Justice Play in Reducing Homelessness? Evidence from Open Door Legal

See also NYC: *Collison, Humphries, Kestelman, Nelson, Van Dyk, Waldinger 2024*

Court Building

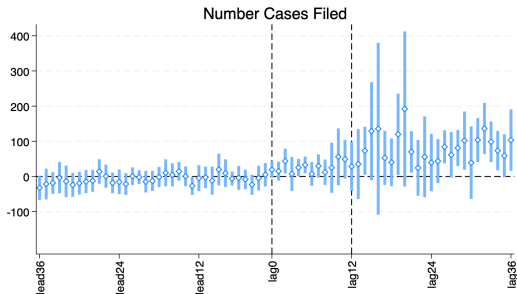
In 2012, Kenya began one of the largest court construction programs on record



Half had exogenous delays in construction

Court Building

Completed courts experienced 60% more cases filed per day



	(1) Civil	(2) Succession	(3) Commercial	(4) Criminal	(5) Property
Completed - LR	0.72** (0.31)	0.68*** (0.22)	0.14** (0.054)	2.10 (1.34)	0.28* (0.16)
Completed - SR	0.53*** (0.18)	0.35** (0.15)	0.081** (0.039)	0.83* (0.42)	0.12 (0.097)
Completed - Bef	0.22 (0.23)	0.17 (0.19)	0.042* (0.025)	0.27 (0.35)	0.12 (0.087)
Control	1.09	0.32	0.065	3.33	0.54
Obs.	33602	33602	33602	33602	33602

► Other type of cases

► Jump to Economic Effects

- Succession: Official land transfer in Kenya requires court cases; often incomplete, limits collateral use.
- Commercial: Contracts, debts, and property rights influences broader economic activities and security.
- Property-related crimes see increased filings, link against expropriation and property damage.

Court Performance

Completed courts reduced case delay by 25%

	(1) Time to Disposition	(2) Number Judges	(3) Time to Disposition
<i>CompletedCourt</i> ¹⁺	-119.2* (59.9)	0.48*** (0.13)	-140.5** (58.9)
<i>CompletedCourt</i> ⁰	-13.5 (52.1)	0.13 (0.15)	-19.4 (49.7)
<i>CompletedCourt</i> ⁻¹	-17.6 (50.3)	0.19 (0.15)	-22.6 (53.0)
Number Judges			38.3** (16.6)
Control Group mean	483.6	1.92	483.6
Observations	125245	33602	125245

- Modern courtrooms, registries, waiting areas, and accessibility features

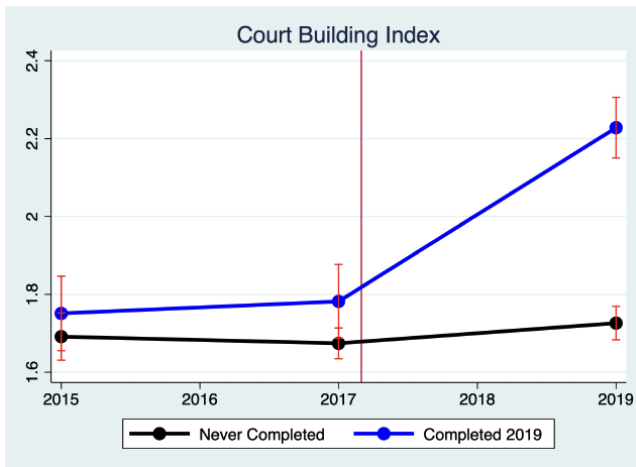
Effects On Quality of Decisions and Cases

	(1) Number Filed Civil Appeals	(2) Number Filed Criminal Appeals	(3) Number Cases Dismissed
<i>CompletedCourt</i> ¹⁺	-0.24 (0.18)	0.096 (0.17)	0.065 (0.46)
<i>CompletedCourt</i> ⁰	-0.14 (0.099)	0.062 (0.12)	0.12 (0.41)
<i>CompletedCourt</i> ⁻¹	-0.18 (0.12)	-0.16* (0.094)	-0.14 (0.34)
Control Group mean	0.31	0.44	1.03
Observations	33602	33602	33602

- no increase in appeals, either civil or criminal
- no increase in summary dismissals/struck out

Impact of Completed Courts

Completed courts increased court satisfaction



Effect on Access to Justice

	(1) Primary Education Parties
Completed Court	0.16** (0.07)
Observations	1,519
Year FE	YES
Court FE	YES
Mean Control Group (SD)	0.42 0.49

- 42 $\implies$ 58%, much more in line with Kenya's average
- Transforms the courts to being nationally representative

	(1)	(2)	(3)	(4)
	Perception Courts	Investment All firms	Investment Contract Intensive	Investment Not Contract Intensive
Completed court * 2018	0.23* (0.13)	67.16* (36.85)	158.50*** (60.55)	7.52 (50.68)
Completed court	0.14 (0.10)	-7.63 (8.93)	-9.42 (11.23)	-6.83 (11.77)
Observations	1,348	566	254	306
Year FE	YES	YES	YES	YES
Mean Dep Var (SD)	2.237 0.964	178.8 859.3	171.2 1094	189.3 604.2

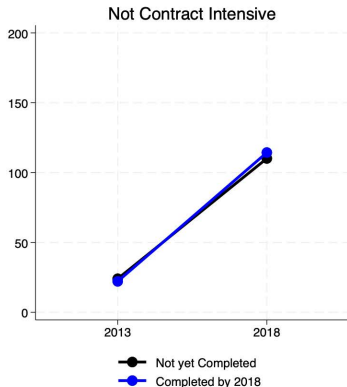
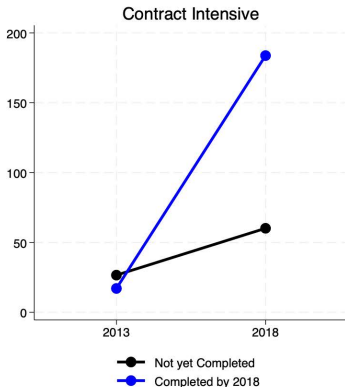
- results consistent with court building being well known by firms
- 37% increase in investment

Firm Investment

Increased investment by firms by 37%

especially in contract intensive industries

Effects of Court Completed on Capital Stock per Worker



- a total added investment of USD 100 million, more than double the costs of the program (USD 45.5 million)

Effects of Court Completion on Property Rights

Completed courts increased property ownership by 5%

	(1) Own Dwelling?
Completed Court	0.035** (0.015)
Control Group mean	0.71
Observations	29082
County FE	YES
Year FE	YES

Building Courts: Effects on Access to Justice and Economic Development

WE SEE THAT COURT SPEED MATTERS

Effects of Court Completion on Property Rights

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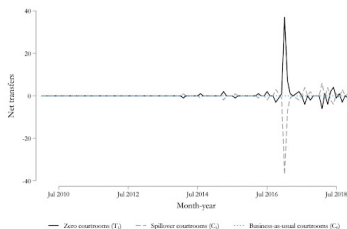
WE SEE THAT COURT SPEED MATTERS

Court Speed Matters

Transferred cases result in Judge changes

that increase case duration by 30%

Figure 12: Density of transfers by month

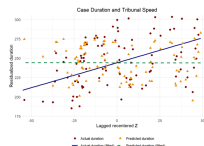


	Days in court	Disposed within 1 year	Number of Hearings	Duration of Hearings
Judge changed	169* (93)	-0.24** (.11)	3.1* (1.8)	83*** (25)
Mean dep. var.	503	0.47	8.1	234
Observations	601540	601775	600268	397902
Month FE	Y	Y	Y	Y
F-test p-value	.12	.063	.085	.049

WHAT IS THE IMPACT OF DELAY ON LITIGANTS' OUTCOMES?

Firms randomly assigned to 1σ faster panels

Increase productivity by 10%



Testing empirically the identification assumptions:

- Tribunal assignment matters for case duration: there is a steep positive correlation between tribunal speed and case duration (blue line)
- Tribunal assignment is random: there is no correlation between duration predicted by baseline case characteristics and tribunal speed (green dotted line)

	Log Sales		
	t-1	t0	t+1
Tribunal Speed	-0.008 (0.025)	0.049 (0.034)	0.099*** (0.034)
1st Stage F-stat	41	41	41
Y mean (level)	9.401	9.053	8.735

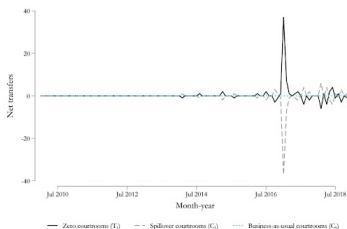
HOW TO INCREASE COURT EFFECTIVENESS?

Court Speed Matters

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Figure 12: Density of transfers by month



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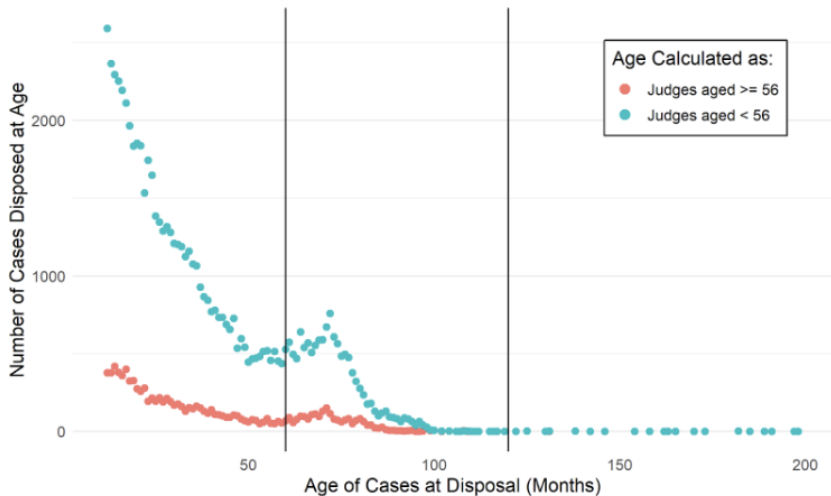
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HOW TO INCREASE COURT EFFECTIVENESS?

Judges respond to productivity quotas

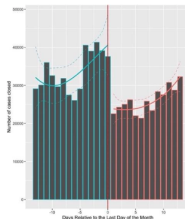


many case types get extra points if case is older than 5 years

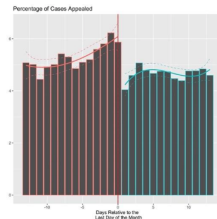
Judges respond to productivity quotas

resolving cases hastily at the end of month

Impact of Judicial Productivity Quotas on Firm Outcomes in Croatia



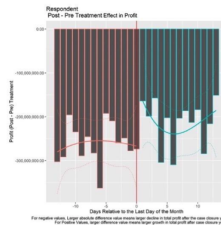
Cases Closed by the days of the month



% Appeals by Case Closing Date

Observe: Judges close more cases towards end of the month

- **RDD:** Cases decided at end of month are more likely to be appealed
- **RDD:** Respondent firms have worse outcomes when their cases are decided at end of month



Post - Pre Treatment Effect for Defendant Firm

but hastened decisions are more likely to be appealed and adversely impact firms

IS THERE A SMOOTHER WAY?

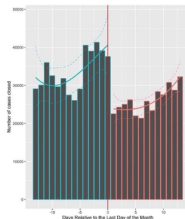
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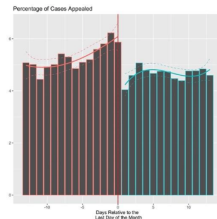
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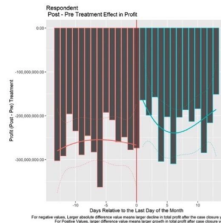
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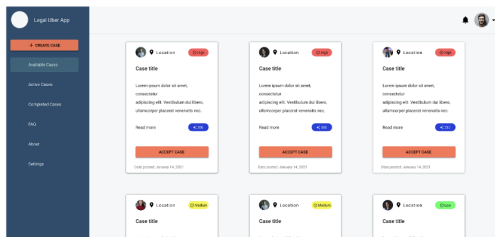
IS THERE A SMOOTHER WAY?

Dynamic Point Systems?

Apply sharing economy principles of low transaction costs, coordination of information networks and better resource allocation and utilization.

Legal Uber App

The web app will display a dashboard interface that allows the supply side user (clerk or judge) to view case availability. Case priority can be determined by how long the case has been idle and in which region it exists. These factors can influence not only the prioritization of a case but also the reward that is offered for taking the case. Participants can volunteer into an incentive scheme that allows them to earn points as they complete the cases. These points can then be spent on various rewards like access to interns, working from home allowance, flexible scheduling, and public recognition. Judges and clerks could also share schedules and professional details like their location and expertise with the system which can assist in determining their suitability for the platform.



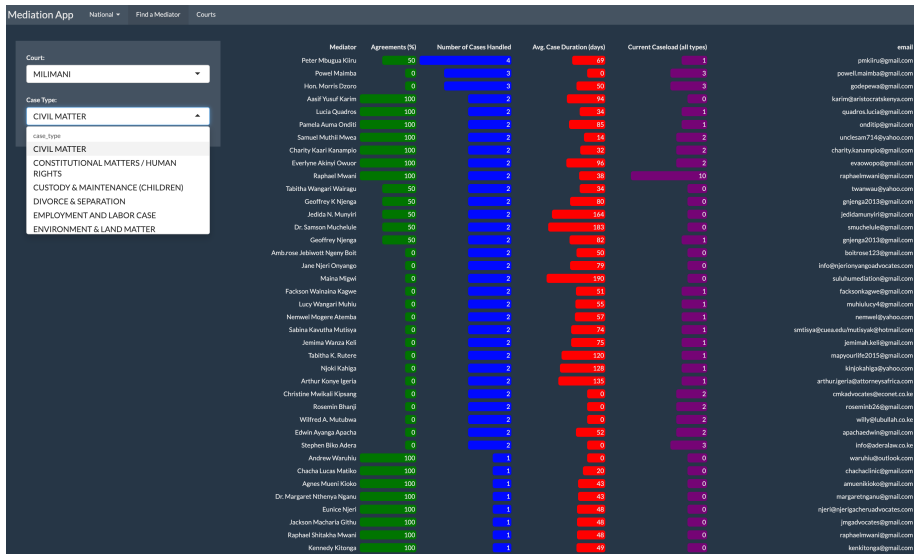
Improve performance in congested courts by balancing workload across courts, without incurring cost of hiring new staff.

Recommending Mediators to Cases based on Value-Added?

Mediation App						
National Find a Mediator Courts						
Court:	Mediator	Agreements (%)	Number of Cases Handled	Avg. Case Duration (days)	Current Caseload (all types)	email
MILIMANI	Peter Mbugua Kilnu	50	4	69	1	pinkiru@gmail.com
	Powell Maimba	0	3	0	3	powellmamba@gmail.com
CIVIL MATTER	Hon. Morris Ozoro	0	3	50	3	godepewa@gmail.com
	Aasif Yusuf Karim	100	2	94	0	karim@ariatocratskenya.com
CIVIL MATTER	Lucia Quadros	100	2	94	1	quadros.lucia@gmail.com
	Pamela Auma Onditi	100	2	85	1	onditi@gmail.com
CIVIL MATTER	Samuel Muthi Mwera	100	2	14	2	unciesam714@yahoo.com
	Charity Kaari Kanampio	100	2	32	2	charitykanampio@gmail.com
CONSTITUTIONAL MATTERS / HUMAN RIGHTS	Everhyme Akinyi Owuor	100	2	96	2	evawowpo@gmail.com
	Raphael Mwari	100	2	38	10	raphaelmwari@gmail.com
CUSTODY & MAINTENANCE (CHILDREN)	Tabitha Wangari Wairagu	50	2	34	0	twamwari@yahoo.com
	Geoffrey K Njenga	50	2	80	0	grijenga2013@gmail.com
DIVORCE & SEPARATION	Jedida N. Muniiri	50	2	164	0	jedidamuniiri@gmail.com
	Dr. Samson Muchele	50	2	183	0	smuchele@gmail.com
EMPLOYMENT AND LABOR CASE	Geoffrey Njenga	50	2	82	1	grijenga2013@gmail.com
	Ambrose Jebiwott Ngeyo Bolt	0	2	50	0	boltrwse123@gmail.com
ENVIRONMENT & LAND MATTER	Jane Njeri Oryango	0	2	79	0	info@jerionyangoadvocates.com
	Maima Migwi	0	2	190	0	sufuhumeditation@gmail.com
ENVIRONMENT & LAND MATTER	Fackson Wainaina Kapwe	0	2	51	1	facksonkapwe@gmail.com
	Lucy Wangari Muihi	0	2	85	1	muhi Lucy4@gmail.com
ENVIRONMENT & LAND MATTER	Nemwell Mogere Atemba	0	2	57	1	nemwell@yahoo.com
	Sabina Kavutha Mutiyya	0	2	74	1	smtiyya@cuae.edu.trmutiyya@hotmail.com
ENVIRONMENT & LAND MATTER	Jemima Wanza Keli	0	2	75	1	jemimah.keli@gmail.com
	Tabitha K. Rutere	0	2	120	1	mapyourlife2015@gmail.com
ENVIRONMENT & LAND MATTER	Njoki Kahiga	0	2	128	1	kinjokahiga@yahoo.com
	Arthur Konye Igeria	0	2	135	1	arthurigeria@attorneyafrica.com
ENVIRONMENT & LAND MATTER	Christine Mwikali Kipsang	0	2	0	2	cmkadvocates@econet.co.ke
	Rosemin Bhanji	0	2	0	2	roseminb26@gmail.com
ENVIRONMENT & LAND MATTER	Wilfred A. Mutubwa	0	2	0	2	willy@tubullah.co.ke
	Edwin Ayanga Apacha	0	2	52	2	apachaedwin@gmail.com
ENVIRONMENT & LAND MATTER	Stephen Biko Adera	0	2	0	3	info@oderaw.co.ke
	Andrew Waruhii	100	1	0	0	waruhia@outlook.com
ENVIRONMENT & LAND MATTER	Chacha Lucas Matiko	100	1	20	0	chachalucic@gmail.com
	Agnes Mueni Kioko	100	1	43	0	amuenikioko@gmail.com
ENVIRONMENT & LAND MATTER	Dr. Margaret Nithenya Ngandu	100	1	43	0	margaretnyandu@gmail.com
	Eunice Njeri	100	1	48	0	njeri@jerigacheruadvocates.com
ENVIRONMENT & LAND MATTER	Jackson Mocharia Githu	100	1	48	0	jmgadvocates@gmail.com
	Raphael Shitaka Mwari	100	1	48	0	raphaelmwari@gmail.com
ENVIRONMENT & LAND MATTER	Kennedy Kitonga	100	1	49	0	kenkitonga@gmail.com

TO DO SO, WE NEED DATA

Recommending Mediators to Cases based on Value-Added?



TO DO SO, WE NEED DATA

Open source decision support

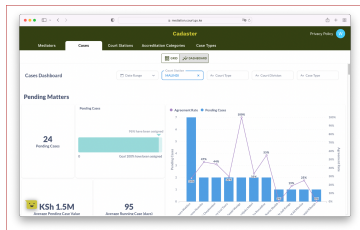
Before: excel spreadsheets

Case No.	Case Name	Case Status	Case Type	Case Location
850	MILIMANI AS AT JUNE 21 2021	PENDING	CIVIL COMMERCIAL LABOR LAND	ELDORET NAKURU KAKAMEGA
851	MILIMANI AS AT JUNE 21 2021	ACTIVE	CIVIL COMMERCIAL LABOR LAND ENVIRONMENT	MURANGA KIAMBU NYERI KIRINYAGA LAKEPA EMBU

disaggregated and disharmonized

Case No.	Case Name	Case Status	Case Type	Case Location
2019	E-REGISTER 2019 MILIMANI AS AT JUNE 21 2021	PENDING	CIVIL COMMERCIAL LABOR LAND	ELDORET NAKURU KAKAMEGA
2020	E-REGISTER 2020 - MILIMANI AS AT JUNE 21 2021	PENDING	CIVIL COMMERCIAL LABOR LAND	ELDORET NAKURU KAKAMEGA
2021	E-REGISTER 2021 - MILIMANI AS AT JUNE 21 2021	PENDING	CIVIL COMMERCIAL LABOR LAND	ELDORET NAKURU KAKAMEGA

After: decision dashboards



and harmonized data-entry

Case No.	Case Name	Case Status	Case Type	Case Location
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2020	E-REGISTER 2020 - MILIMANI AS AT JUNE 21 2021	PENDING	CIVIL COMMERCIAL LABOR LAND	ELDORET NAKURU KAKAMEGA
2021	E-REGISTER 2021 - MILIMANI AS AT JUNE 21 2021	PENDING	CIVIL COMMERCIAL LABOR LAND	ELDORET NAKURU KAKAMEGA

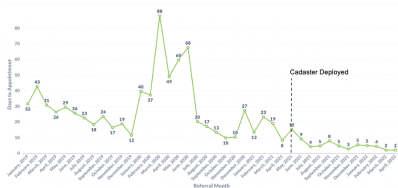
Harmonized data and dashboards

increased speed in appointments

reduced case delay without adverse effects

Observational Impact

Faster mediator appointment



Faster case conclusion without hurting settlement rate*



AEARCTR-0007699, *The Impact of Case Management on Court-Annexed Mediation in Kenya*

SEEING STATISTICS ABOUT THE SELF

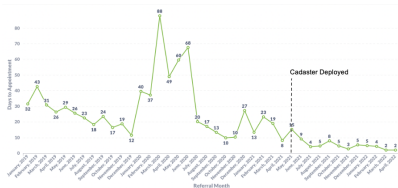
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SEEING STATISTICS ABOUT THE SELF

Dashboard RCT improved case outcomes

increased settlement rates

Improving the Quality of Legal Aid: Tech-Enabled Mediation in Peru

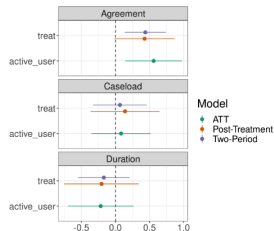
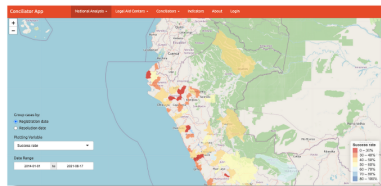
Research design: Randomized controlled trial across 80 legal stations in Peru

- **Treatment:** Conciliator App to self-assess performance indicators
- **Control:** No access

App increases agreement rate by 0.5 standard deviations.

RCT 1.2: Coaching or Vertical accountability

RCT 2: Reddit forum using Netflix recommendation system



Dashboard RCT improved judicial performance

increased case clearance rates

Information Provision and Court Performance: Experimental Evidence from Chile

Research design: RCT across 55 court stations

- Simple dashboards alleviate the impacts of limited information.
- Courts adjust their decisions and improve court efficiency. Email promotion and feedback increase the timely resolution rate by 0.2 and 0.5 standard deviations, respectively, and hearing programming by 0.7 and 1.3 standard deviations, while they decrease the realized hearings by -1.3 and -1.0 standard deviations for those treated.



simple e-justice interventions enhance judicial state capacity

AEARCTR-0005512, *Information Provision and Court Performance: Experimental Evidence from Chile*

WHAT ABOUT E-COURTS?

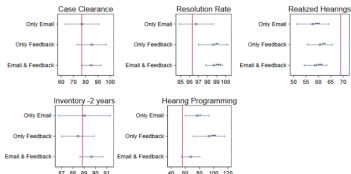
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AEARCTR-0005512, *Information Provision and Court Performance: Experimental Evidence from Chile*

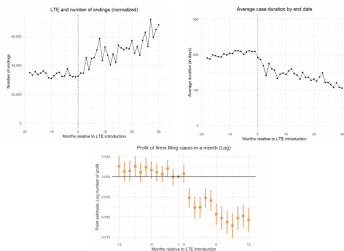
WHAT ABOUT E-COURTS?

What is the Impact of E-Justice?

E-filing reduced case duration and increased access to justice,
particularly for smaller parties

Peru & Chile Improving the Performance of Justice Services (P162833, P173860)

Question: Can technological innovations improve the performance of courts and the overall wellbeing of litigants?



Intervention:

- Electronic filing of cases (LTE) began in 2016
- Interrupted time-series analysis of LTE courts
- Total number of cases filed and resolved increased
 - Duration of cases significantly decreased
 - Even for non-spurious cases
- Smaller firms have greater access
- Next: What are the impacts on firms?

IE design and timeline:

- Geospatial Impact Evaluation (GIE)
- 2020-

Key Feature : Electronic processing is a common policy intervention; covid accelerates development of e-justice solutions

Impact of e-Access to Justice: Evidence from Chile

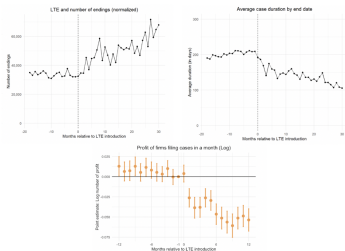
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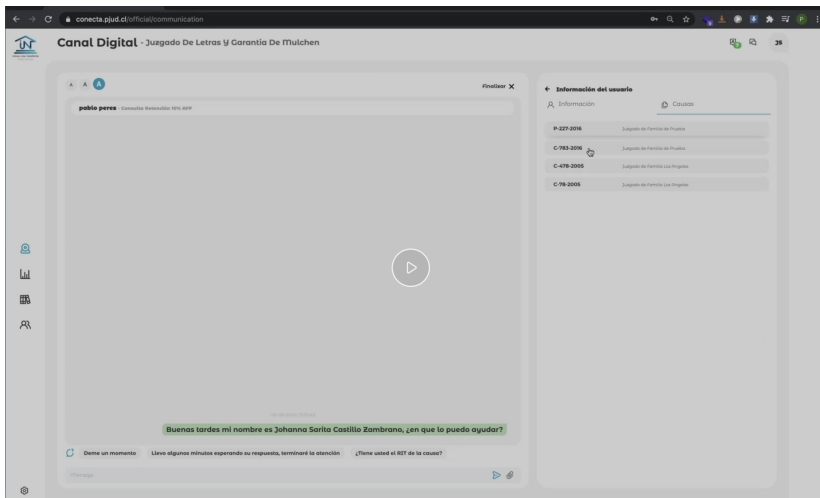
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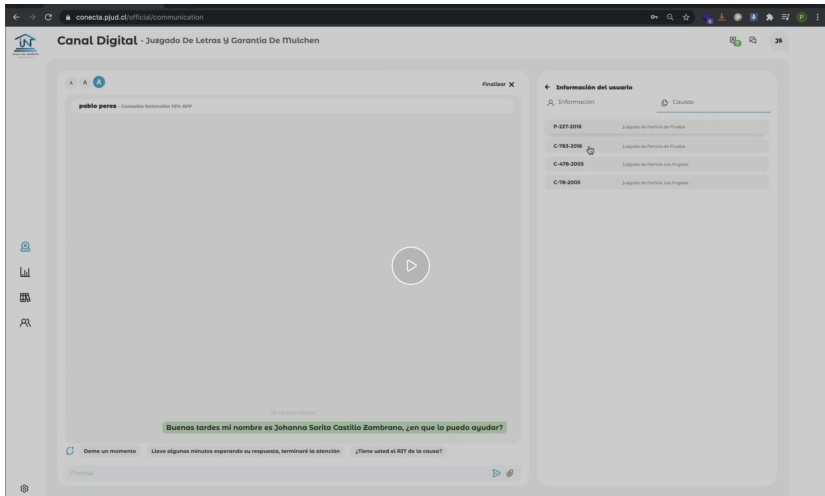
E-Justice during covid: Whatsapp



for Q&A with courts

video and audio also enabled

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video and audio also enabled

.. Receivers are given text to copy and paste (chatbots/humans?)

Canal Digital - Juzgado De Letras Y Garantía De Mulchen

Finalizar X

pablo peres • Consulta Resolvida 10% RFP

Buenas tardes mi nombre es Johanna Sarita Castillo Zambrano, ¿en que lo puedo ayudar?

Hola

Cómo están

Documento (.docx)

Deme un momento • Llevo algunos minutos esperando su respuesta, terminaré la atención

Message

Causa C-478-2005

Buscar Trámite

Dec.	Núm.	Etapas	Trámite	Referencia	Fecha Trámite
	0	Terminada	Resolución	Archivar	03-12-2007
	0	Terminada	Resolución	Como se pide	27-10-2007
		Terminada	Escrito	Sin referencia	24-10-2007
	0	Sentencia	Resolución	Oficio Registro Civil	06-09-2007
	0	Sentencia	Actuación	Ejecutora	06-09-2007
		Sentencia	Escrito	Sin referencia	31-07-2007
	0	Sentencia	Resolución	Reprobacion Sentencia Corte	31-07-2007
	0	Sentencia	Resolución	Oficio Consulta Corte	14-09-2007
	0	Sentencia	Actuación	Resumen	12-05-2007
	0	Sentencia	Actuación	Notificación 04/05/07	07-05-2007
	0	Sentencia	Actuación	cumplase 04/05/07	07-05-2007
	0	Sentencia	Actuación	Resumen	01-03-2007
	0	Sentencia	Resolución	Consulta Corte	22-02-2007
	0	Sentencia	Resolución	Oficio Resumen	22-02-2007
	0	Rudencia de Juicio	Sentencia	Dicción de sentencia	01-02-2007
	0	Rudencia de Juicio	Resolución	Como se pide	31-01-2007

P-227-2016 C-763-2016 **C-478-2005** C-79-2005

documents are linked

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Canal Digital - Juzgado De Letras Y Garantía De Mulchen

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pablo peres • Consulta Resolvida 10% RFP

26-08-2007 09:00:00

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	0	Audiencia de Juicio	Sentencia	Dictación de sentencia	01-02-2007
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documents are linked

Cases are linked across calls

.. and into the courts (DIGITAL INTEROPERABILITY)

Canal Digital - Juzgado De Letras Y Garantía De Mulchen

← Volver al listado

Historia

- pablo perez** 13:34:50
pablo perez contactó al tribunal
2 segundos
- Johanna Sarita Castillo Zambrano** 13:34:52
Atención **aceptada** por Johanna Sarita Castillo Zambrano
13 segundos
- Johanna Sarita Castillo Zambrano** 13:35:05
Buenas tardes mi nombre es Johanna Sarita Castillo Zambrano, ¿en que le puedo ayudar?
39 segundos
- pablo perez** 13:36:05
Hola
2 segundos
- pablo perez** 13:36:07
Cómo están
10 segundos
- Johanna Sarita Castillo Zambrano** 13:36:19
Llevo algunos minutos esperando su respuesta, terminare la atención
1 segundo
- Johanna Sarita Castillo Zambrano** 13:36:30
Adios
3 segundos

Participantes

- pablo perez**
Usuario
- Johanna Sarita Castillo Zambrano**
Funcionaria

Duración

Espera: 00:00:02

Atención: 00:01:30

Información del Usuario

RUT 6.187.814-9	Fecha Atención 28-08-2020 13:34:30
Nombre pablo perez	Tipo Whatsapp
Teléfono 964.395678	

No se realizaron observaciones

FACILITATING DOWNSTREAM ANALYSIS ON CONSEQUENCES

Cases are linked across calls

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FACILITATING DOWNSTREAM ANALYSIS ON CONSEQUENCES

40% of inquiries were gender-related

Rolled out nationally (and advertised on Facebook)



to improve speed of justice

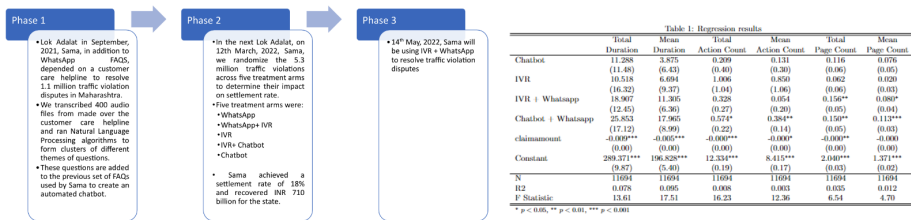
Chatbot & WhatsApp RCT improved dispute resolution and fiscal recovery for the state

Impact of Online Lok Adalats on Judicial Efficiency

With SAMA

Context

- A 2004 study in the US demonstrates that Alternative Dispute Resolution approaches reduced the number of trials (Stipanowich, 2004). We extend this hypothesis to Online Dispute Resolution with the aim to measure its impact on justice outcomes and judicial efficiency.
- This workstream seeks to deploy the technologies developed by Sama to scale up mediation services to poorly served locations in partnership with various state legal service authorities across India.
- Chatbot and WhatsApp performs best and significantly improved settlement rate and fiscal recovery for the state.



Chandra, Chen, Nagarathinam, Review of Law & Econ 2024

FROM WHATSAPP TO ZOOM TO ..

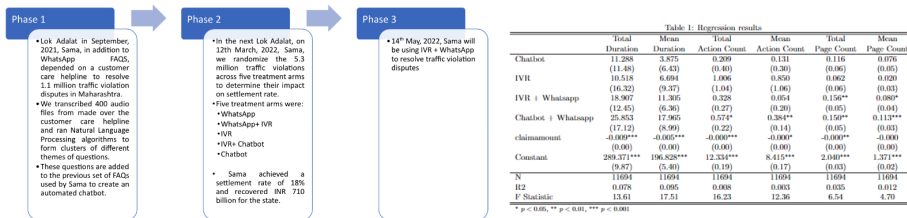
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FROM WHATSAPP TO ZOOM TO ..

Metaverse

Colombia court moves to metaverse to host hearing

By Isabel Woodford ▾

February 24, 2023 11:08 PM GMT+1 · Updated 3 months ago



64 J.L. & Econ. 269 (2021)
Racial Bias and In-Group Bias in Virtual Reality Courtrooms

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Judicial Analytics for Recognition and Dignity

Can AI improve decision-making? *Babic, Chen, Evgeniou, and Fayard, Harvard Business Review 2020*

- Cognitive science and psychology suggests that humans have limited and imperfect reasoning capacities (Tversky and Kahneman 1986; Eyster 2019)
- Gambler's fallacy, mood, time of day, order, ...
 - ▶ highlight fragility of courts
 - ★ "In a crowded immigration court, 7 minutes to decide a family's future" (Wash Post 2/2/14)
- Policy discussion tends to revolve around having AI replace humans or suggest the optimal decision
- Consider instead an incremental approach based on Enlightenment and Romantic ideals of the self: self-knowledge, self-expression

(Charles Taylor, Sources of the Self, 1989; The Ethics of Authenticity, 1992)

Asian J of Law and Economics 2023

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Stage 1: Predicted Self

- In Stage 1, people use AI as a support tool, speeding up existing processes (for example, by prefilling forms)
 - ▶ An AI-based recommender system offers a decision-maker the best prediction of themselves, based on their previous decision-making, **from a model using only legally relevant features X.**
 - ★ assess judges vs. their predicted self
 - ▶ (1) Increase consistency across similar cases by offering the relevant reference points and cabining the influence of extraneous factors.
 - ▶ (2) Seeing the predicted self leverages self-image motives of pro-social decision-makers (Benabou and Tirole 2011).
 - ▶ (3) Deviating from defaults facilitates conscious deliberation.
- self-image (predicted self)

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Stage 2: Prediction of Error

- A deviation that is more likely to render an error (from a model using all available features X and W) can be accompanied by a nudge to “be more attentive” or spend more time to make a better decision.
 - ▶ (1) A nudge, instead of a checklist, might impose less bandwidth.
 - ▶ (2) Save time and energy to focus on novel, complex cases.
- self-improvement (nudges)

Stage 3: Explanations

- A decision-maker may want interpretable machine learning **and** request a reason for why the deviation may lead to mistakes.
 - ▶ (1) Stage 3 elevates the AI to the role of a more general coach, providing feedback on choices.
 - ▶ (2) The more people feel that their autonomy is protected and that they are in control of the conversation—able to choose when feedback is given—the better they respond to it. (West and Thorson 2018)
- self-understanding (why)

Stage 4: Dialogue

- Of course, it is always possible that the AI system's suggestion would not take into account some reliable private information that the decision-maker might have access to.
 - ▶ Where this happens, the AI system would be steering the decision-maker off course rather than correcting for their inconsistencies.
 - ▶ Therefore, a dialogue, encouraged between the decision-maker and the AI system, allowing for the AI to learn from the user as well.
- self-expression (autonomy)

Stage 5: Community of Experts

- AI brings in other people's decision histories and patterns, serving as a platform for a community of experts.
 - ▶ A decision-maker may want to access a community of experts by seeing what the algorithm predicts other to do.
 - ▶ This can be accessible as a dropdown menu, to seek advice from a particular decision-maker,
 - ★ or as a statistical distribution to protect privacy.
- community of practice (self vs. others)

Stages 6+

- Stage 6, train novices
 - ▶ who tend to make more mistakes
 - ▶ experts can input a preferred decision
 - ▶ or use prediction if appealed
- Stage 7, open access for citizens
 - ▶ for transparency & accountability (Kenya)
 - ▶ social image (reputation sanctions in lieu of contracts)
- Stage 8, use feedback from dialogue stage as recommender system
 - ▶ with A/B testing to generate causal inference

Stages 6+

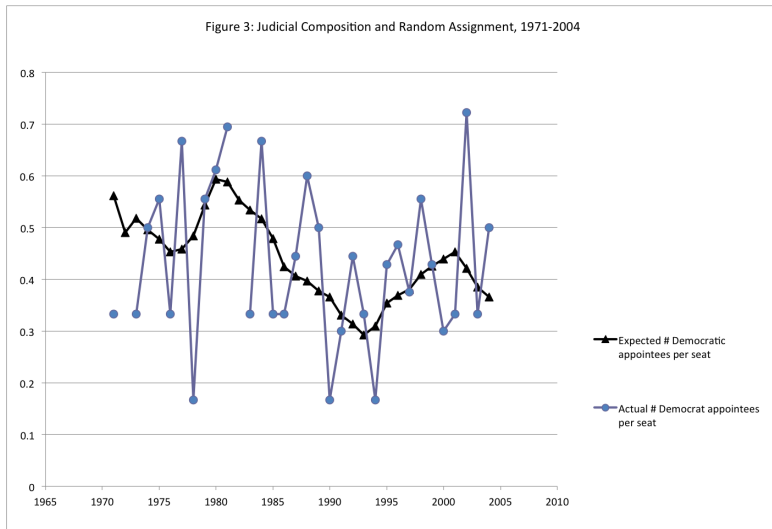
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Randomization of cases already yields A|B testing

Decisions are not random, but judges are randomly assigned



Data

- Chicago Judges Project (Sunstein et al. 2006; Heise and Sisk 2012; other smaller samples)
6000+ hand-coded cases in 26 polarized legal areas

Civil Rights	Property	Constitutional	Constitutional
sexual harassment	eminent domain	free speech	abortion
affirmative action	corporate veil piercing	campaign finance	Establishment Clause
sex discrimination	contracts	First Amendment	Free Exercise Clause
Title VII	environmental protection	Eleventh Amendment	capital punishment
desegregation	NEPA	standing	criminal appeals
gay rights	punitive damages	federalism	
disability rights	National Labor Review Board	FCC	

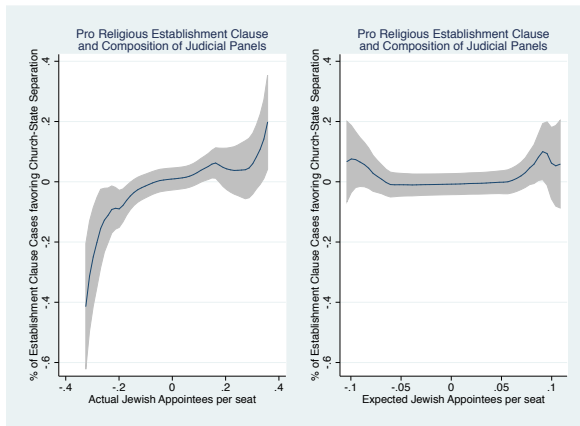
- Federal Judicial Center biographies

e.g., party, religion, race, gender, college, law school, graduate law degree, year of birth, ABA rating, wealth, appointed when President and Congress majority were from same party, appointed by president from opposing party, prior judiciary experience, prior law professor, prior government experience, previous U.S. attorney, previous asst U.S. attorney

Dissent is roughly half-driven by shared personal features.

What Matters, Chen, Cui, Shang, Zheng, NeurIPS 2016 (Machine Learning and the Law)

Biographies Predict Church-State Separation

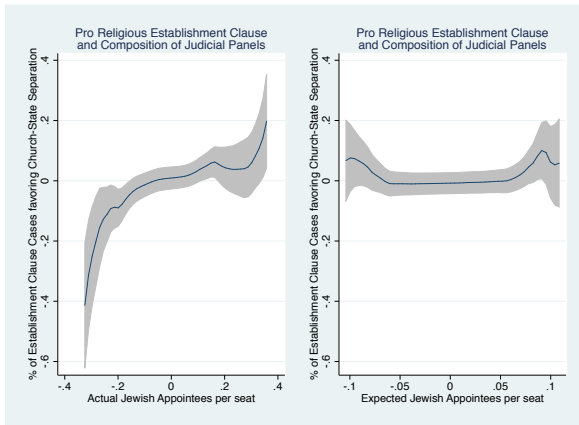


Minority religion judges prefer separate church and state

The Political Economy of Beliefs

$$\begin{cases} \text{Law}_{ct} = \alpha_{ict} + \phi Z_{ct} + \gamma_1 X_{ict} + \gamma_2 W_{ct} + \eta_{ict} & (\text{machine learning step}) \\ Y_{ict} = \alpha_{ict} + \rho \text{Law}_{ct} + \beta_1 X_{ict} + \beta_2 W_{ct} + \varepsilon_{ict} & (\text{causal inference step}) \end{cases}$$

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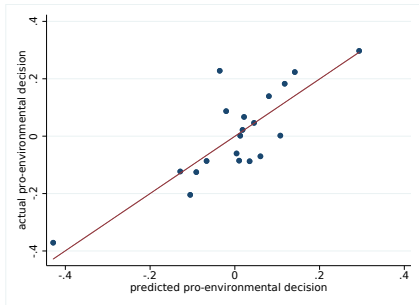


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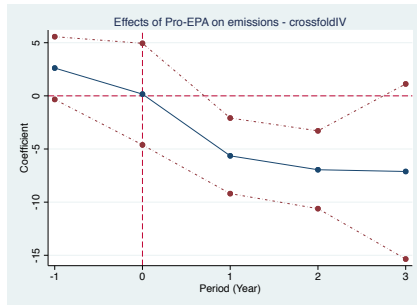
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Impact of Environmental Decisions

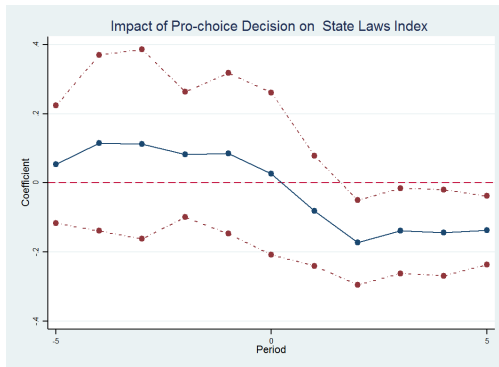


Calibration plot



Rulings in favor of EPA regulations reduce air pollution

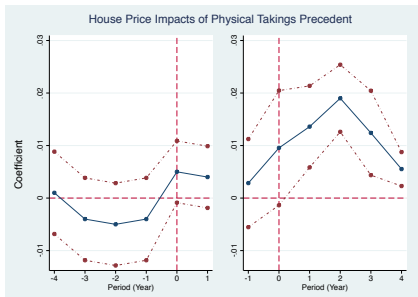
State Compliance with Abortion Jurisprudence



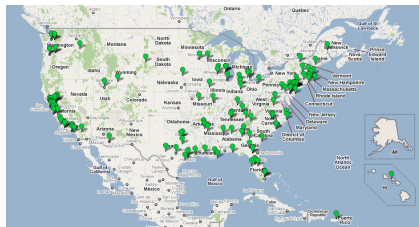
- Index of state laws (Blank et al. 1996)
 - ▶ (i) regulations requiring mandatory delay,
 - ▶ (ii) banning the use of Medicare payments to fund abortion,
 - ▶ (iii) requiring parental notification
- Immediately observed after 1 year
- Pro-choice precedent causes 18% smaller likelihood in *each* regulation in *each* state

Can Policies Affect Preferences, Scandinavian Journal of Economics R&R

Local vs. Precedential Impacts of Takings (Power)



No lead effect



Zip code origin distinguishes local v. precedential effects

$$Law_{ct} + LocalLaw_{zct}$$

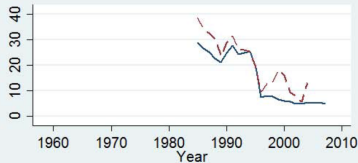
Growth Under the Shadow of Expropriation

Sexual Harassment Law Increases Female Labor Share

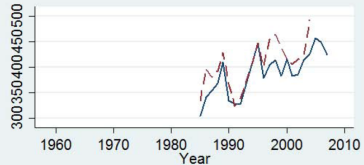
	β_3	Joint F
A. Add Circuit-Specific Trends	0.016	8.35
B. Drop θ_c, θ_t	0.016	8.17
C. Only 1 $[M_{ct-n} > 0], F_{ict}$	0.017	8.08
D. Add $E(\frac{N_{ct}}{M_{ct}})$	0.016	8.31
E. Add State Fixed Effects	0.016	8.00
F. No CPS Weights	0.013	16.49
G. Add 2-year Lead	0.021	19.25
H. Drop 1 Circuit		
Circuit 1	0.015	6.57
Circuit 2	0.017	14.22
Circuit 3	0.016	13.81
Circuit 4	0.017	17.12
Circuit 5 (TX, LA, MS)	0.007	37.15
Circuit 6	0.017	6.61

Free Speech and the First Amendment *Social Science Research, R&R*

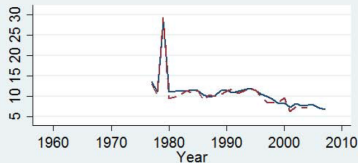
Counterfactual analysis for UCR



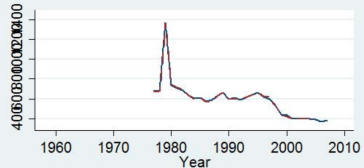
— Actual Prostitution per 100,000
- - Counterfactual Prostitution per 100,000



— Actual Drug violations per 100,000
- - Counterfactual Drug violations per 100,000

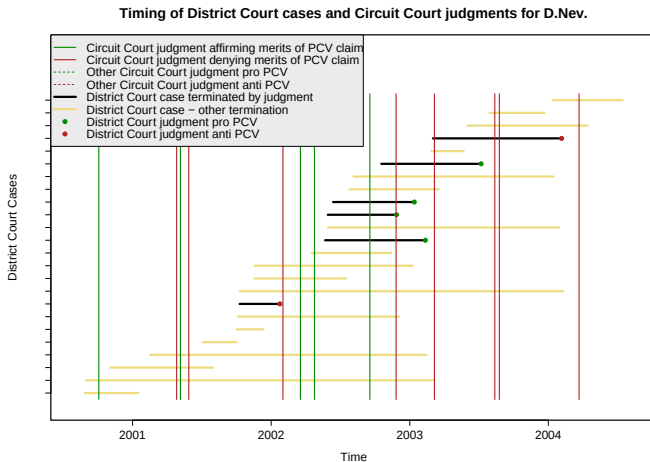


— Actual Forcible Rapes per 100,000
- - Counterfactual Forcible Rapes per 100,000



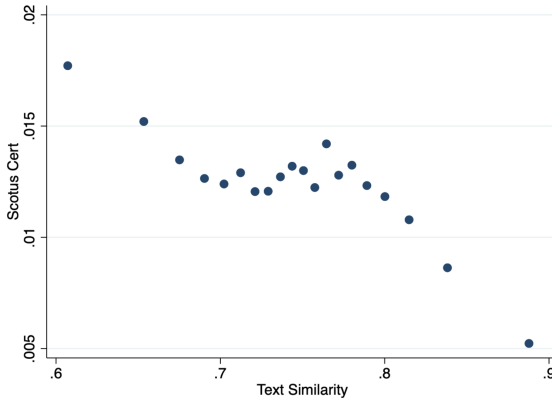
— Actual Property crimes per 100,000
- - Counterfactual Property crimes per 100,000

Judicial Compliance to Circuit Precedents *Intl Rev of Law & Econ, 2023*



Mapping the Geometry of Law Using Document Embeddings

Dissimilarity predicts reversals



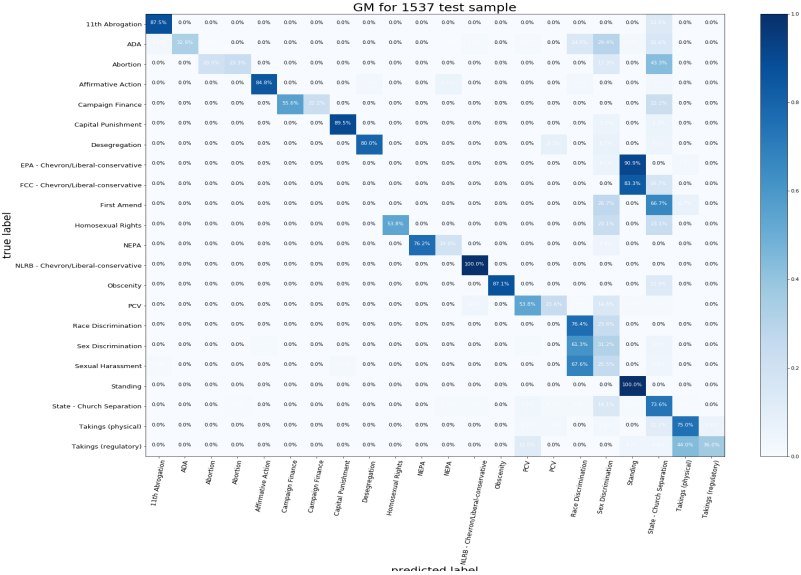
Modularity and Extensibility *(automating the Chicago Judges Project)*

- District Cases →
- District Judge Bio →
- Circuit Case Appeal $1[M_{ct} > 0]$ →
- Circuit Judge Bio →
- **Circuit Case Decision** Law_{ct} →
- Precedential Effects (e.g., State Laws) →
- Promulgation (e.g., News) →
- Outcomes

Modularity and Extensibility *(automating the Chicago Judges Project)*

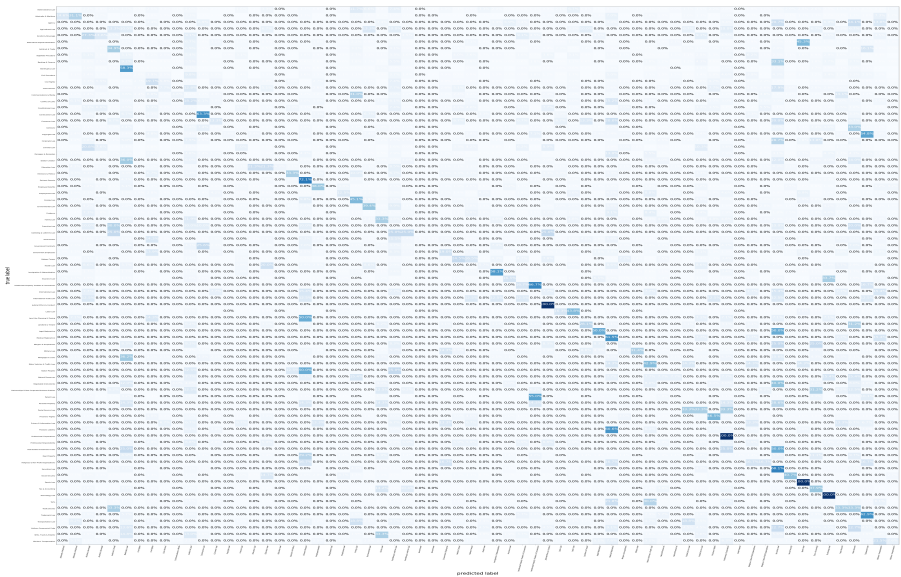
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Learning Policy Levers



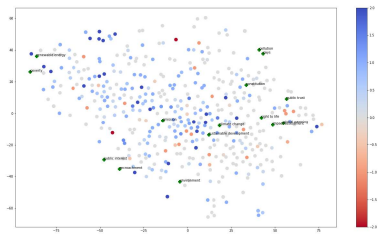
correctly identifies 15 of 22 Chicago Judges Project areas

Learning Policy Levers

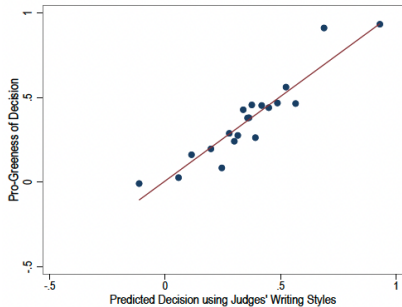


Chicago Judges Project as training, classifies 35 out of 82 topics correctly in 5% sample

Impact of Environmental Decisions in India

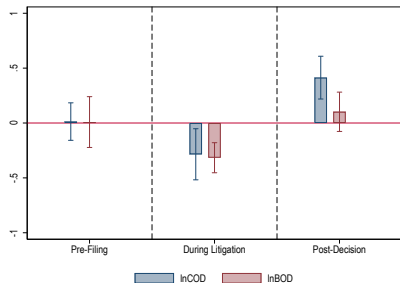


Judges predicted to be Green cluster together

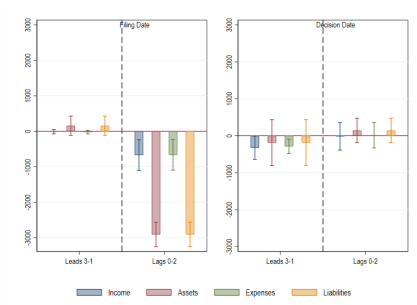


and affect verdicts

Environmental Litigation as Scrutiny



Green judges reduce pollution and



firm activity

A Four Decade Analysis of Environmental Justice, Firms, and Pollution in India

Automated Impact Analysis?

locate the nearest past cases, assignment of judges to those cases, and predict their rulings to identify the consequences of decisions

- 1. Identifying the nearest cases
- 2. Fast decision classification
- 3. Document embedding
- 4. Judge embedding

Learning Policy Levers

Automated Fact-Value Distinction, Cao, Ash, Chen, EJLE

Does Dicta Matter

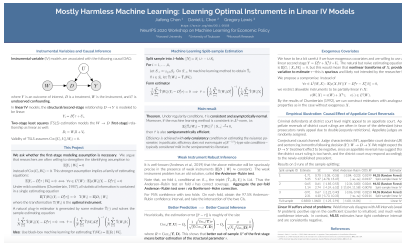
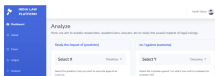
Deep IV in Law, Chen, Huang, Wang, NeurIPS 2019 (CausalML), CUP

Law Platform

India Law platform is a data discovery and interactive tool for researchers, judges, and policymakers. There are two essential features of this platform.

First, it locates the closest cases to any given case. This allows a user to understand previous rulings and how past decisions were ruled. This can be filtered by jurisdiction, time period, or judge. More broadly, the user can research the details of the cases and what precedents or statutes were cited.

Second, it allows the user to analyze the effects of rulings on downstream outcomes. A dropdown menu offers available outcomes in the platform so that the user can specify the causal outcome of interest. To do this causal analysis, the platform first coalesces the nearby past cases to a given case. Then it uses the identity of the judges assigned in those cases as a historical natural experiment.



Chen, Chen, and Lewis; NeurIPS 2020 (ML for Policy)

Training Public Officials

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Learning Policy Levers

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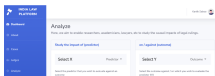
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Mostly Harmless Machine Learning: Learning Optimal Instruments in Linear IV Models
Jeffrey Chen¹, Daniel S. Chen², Sangyeun Lee¹
¹Google Research, ²University of California, Berkeley
jeffrey.chen@google.com, daniel.chen@berkeley.edu, sangyeun.lee@google.com

Abstract Instrumental variables (IV) models are a standard tool for causal inference in observational data. However, IV models are often misspecified, leading to biased estimates. We propose a new method for learning optimal instruments in linear IV models. Our method is based on a new perspective on the IV model, which allows us to learn the optimal instrument by minimizing the variance of the IV estimator. We show that our method is consistent and asymptotically normal. We also show that our method is robust to misspecification. We evaluate our method on synthetic and real data, and show that it outperforms existing methods.

1 Introduction Instrumental variables (IV) models are a standard tool for causal inference in observational data. However, IV models are often misspecified, leading to biased estimates. We propose a new method for learning optimal instruments in linear IV models. Our method is based on a new perspective on the IV model, which allows us to learn the optimal instrument by minimizing the variance of the IV estimator. We show that our method is consistent and asymptotically normal. We also show that our method is robust to misspecification. We evaluate our method on synthetic and real data, and show that it outperforms existing methods.

2 Preliminaries Consider a linear IV model with a single endogenous variable Y and a single exogenous variable X . The model is written as $Y = \beta X + \epsilon$, where β is the causal effect of X on Y , and ϵ is the error term. The IV estimator is defined as $\hat{\beta} = \frac{Cov(Y, Z)}{Cov(X, Z)}$, where Z is the instrument. The IV estimator is consistent and asymptotically normal under certain conditions.

3 Our Method We propose a new method for learning optimal instruments in linear IV models. Our method is based on a new perspective on the IV model, which allows us to learn the optimal instrument by minimizing the variance of the IV estimator. We show that our method is consistent and asymptotically normal. We also show that our method is robust to misspecification. We evaluate our method on synthetic and real data, and show that it outperforms existing methods.

4 Experiments We evaluate our method on synthetic and real data. We show that our method outperforms existing methods in terms of accuracy and robustness. We also show that our method is scalable to large datasets.

5 Conclusion We propose a new method for learning optimal instruments in linear IV models. Our method is based on a new perspective on the IV model, which allows us to learn the optimal instrument by minimizing the variance of the IV estimator. We show that our method is consistent and asymptotically normal. We also show that our method is robust to misspecification. We evaluate our method on synthetic and real data, and show that it outperforms existing methods.

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