Real-time use of impact evaluation to achieve impact

Arianna Legovini
DIME, World Bank
main problem
in running efficient public administrations

PUBLIC SECTOR IS DATA RICH BUT INFORMATION POOR

DATA ANALYTICS AND POLICY EXPERIMENTS CAN GUIDE POLICY & INCREASE EFFICIENCY
main findings

Across our research in justice, tax, customs, public procurement and civil service ... 
...demonstrated impact of data analytics and policy experiments in improving management practices 
...resulting in huge efficiency gains and fiscal savings (in % of GDP)
• Establish global depository for e-government data
• Data analytics to improve public sector management
• Benchmark to incentivize performance
• Policy experiments (the how)
• Impact evaluation of reform programs (the what)

the opportunity
What is DIME?

- conduct
- rigorous research
- generate
- actionable data
- and evidence
- inform
- real-time decisions
- increase
- policy effectiveness
Country Engagements

Geographical Distribution
Total IEs

203 IEs across 52 countries
### DIME IEs by sector

Leverage $20 billion in development finance

#### Percentage and Number of IEs

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>16%</td>
<td>33</td>
</tr>
<tr>
<td>Governance</td>
<td>15%</td>
<td>30</td>
</tr>
<tr>
<td>Agriculture</td>
<td>14%</td>
<td>28</td>
</tr>
<tr>
<td>Social Protection</td>
<td>9%</td>
<td>19</td>
</tr>
<tr>
<td>Health, Nutrition &amp; Population</td>
<td>9%</td>
<td>18</td>
</tr>
<tr>
<td>Finance, Competitiveness &amp; Innovation</td>
<td>8%</td>
<td>16</td>
</tr>
<tr>
<td>Social, Urban, Rural &amp; Resilience</td>
<td>7%</td>
<td>14</td>
</tr>
<tr>
<td>Water</td>
<td>4%</td>
<td>9</td>
</tr>
<tr>
<td>Jobs &amp; Development</td>
<td>3%</td>
<td>7</td>
</tr>
<tr>
<td>Environment &amp; Natural Resources</td>
<td>3%</td>
<td>7</td>
</tr>
<tr>
<td>Education</td>
<td>3%</td>
<td>6</td>
</tr>
<tr>
<td>Macroeconomics, Trade &amp; Investment</td>
<td>2%</td>
<td>5</td>
</tr>
<tr>
<td>Energy</td>
<td>2%</td>
<td>5</td>
</tr>
<tr>
<td>Poverty</td>
<td>1%</td>
<td>3</td>
</tr>
<tr>
<td>Digital Development</td>
<td>1%</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Development Financing Amount (USD million)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Amount</th>
<th>WB Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>$9,232</td>
<td>-</td>
</tr>
<tr>
<td>Governance</td>
<td>$892</td>
<td>$846</td>
</tr>
<tr>
<td>Agriculture</td>
<td>$1,539</td>
<td>$1,433</td>
</tr>
<tr>
<td>Social Protection</td>
<td>$1,373</td>
<td>$1,201</td>
</tr>
<tr>
<td>Health, Nutrition &amp; Population</td>
<td>$462</td>
<td>$441</td>
</tr>
<tr>
<td>Finance, Competitiveness &amp; Innovation</td>
<td>$808</td>
<td>$806</td>
</tr>
<tr>
<td>Social, Urban, Rural &amp; Resilience</td>
<td>$997</td>
<td>$963</td>
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<tr>
<td>Water</td>
<td>$1,190</td>
<td>$1,067</td>
</tr>
<tr>
<td>Jobs &amp; Development</td>
<td>$103</td>
<td>$60</td>
</tr>
<tr>
<td>Environment &amp; Natural Resources</td>
<td>$687</td>
<td>-</td>
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<tr>
<td>Education</td>
<td>$540</td>
<td>-</td>
</tr>
<tr>
<td>Macroeconomics, Trade &amp; Investment</td>
<td>$91</td>
<td>$66</td>
</tr>
<tr>
<td>Energy</td>
<td>$650</td>
<td>$60</td>
</tr>
<tr>
<td>Poverty</td>
<td>$125</td>
<td>-</td>
</tr>
<tr>
<td>Digital Development</td>
<td>$80</td>
<td>-</td>
</tr>
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</table>
ieGovern (2013)

• A strong collaboration between operations and research to improve the efficiency and effectiveness of public administrations
  – Bureaucracy lab (2016)
  – DEJuRe (2017)
ieGovern impact evaluation timeline

2013
Local government
Civil service

2015
Procurement
Civil Service
Tax

2017
BUREAUCRACY LAB:
Innovating bureaucracy
DEJURE:
Justice reform

2019
Bureaucracy Lab:
Administrative Reforms
In EU member states

Upcoming ieConnect:
Customs reforms
ieGovern Portfolio

- 26 Impact Evaluations across 6 regions & 5 sectors
  - Civil Service Reform (9)
  - Procurement (5)
  - Revenue Mobilization (2)
  - Justice (6)
  - Subnational (4)
- $3.5M awarded to projects from DIME i2i Trust Fund
- $14M of project funds levered for IE implementation
DIME evaluation

Operational, Problem-driven, Iterative, Counterfactual evaluation

- To identify cause effect relationships using RCTs or other causal inference methods

- To give precise and actionable answers

- and help program manager make more informed decisions about their program, what to deliver, the way to deliver it, who to deliver it to...
From design throughout implementation...

DATA & EVIDENCE TO INFORM A PROCESS OF ADAPTIVE POLICY MAKING
IE improves program design
89% government score

- Government/Implementing Agency: 89% Yes, 0% Don't Know
- WB Operations TTL: 81% Yes, 0% Don't Know
- IE TTL: 76% Yes, 5% Don't Know
- All: 82% Yes, 3% Don't Know

- Efficiency or quality of operation: 54% Yes, 26% No, 20% Don't Know
- Program Take-up: 37% Yes, 33% No, 3% Don't Know
- Program delivery: 37% Yes, 33% No, 3% Don't Know
- Targeting: 34% Yes, 26% No, 3% Don't Know
- New regulation: 17% Yes, 26% No, 5% Don't Know
- Other: 8% Yes, 6% No, 6% Don't Know
DIME has demonstrated project efficiency gains

- DIME has generated direct savings for each project that it engages with (~175k per project)
  - Improving project quality at entry
  - Reducing project implementation delays
  - Reducing supervisions costs
  - Reducing time of Implementation Completion Report (ICR) preparation

<table>
<thead>
<tr>
<th>Efficiency margin</th>
<th>Gain</th>
<th>Rate of gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projects with IE speeds up implementation</td>
<td>Reduction of 3 quarters in project duration</td>
<td>~15% faster implementation (average project length is 21 quarters)</td>
</tr>
<tr>
<td>Completion report preparation time is substantially reduced</td>
<td>50 days reduction in time between project closing and completion report submission</td>
<td>~17% faster completion report submission (closing to is 300 days on average)</td>
</tr>
</tbody>
</table>
“WALKING ACROSS THE CORRIDOR” CAN INCREASE PERFORMANCE IN AND ACROSS PUBLIC-SECTOR ORGANIZATIONS
MEASURING PRODUCTIVITY CAN HELP US TARGET LOW PERFORMERS
DIME digitized thousands of proceedings in Dakar Courts

Analysis informed regulatory reform

New regulation reduced pretrial period by a quarter

Senegal went up the doing business ranks

NOW we use smart court data to help courts all over the world do better
IE improves M&E
100% government score

- Government/Implementing Agency: 100%
- WB Operations TTL: 93%
- IE TTL: 83%
- All: 91%

Indicators: 41%
Capacity building: 52%
Data collection systems: 30%
Monitoring and information systems: 29%
Other: 11%
Procurement

- Benchmarked procurement efficiency all over the world
- Develop subnational indicators for public sector performance
- Systematic measurement of reforms
- Opportunity for rapid experimentation with solutions
Senegal Justice Data

• Regional Commercial Court: case-level data digitized from paper files
  - 5,000 cases corresponding to 2,100 unique firms
  - High granularity & frequency
  - Quality (prop. appealed cases reversed, # citations, word counts)

• Revenue data:
  - Match tax data for 1,000 firms

• Firm survey: located and interviewed 227 firms
Croatia Justice Data

Integrated case management system
• Case-level data on 5 million cases
• Metadata on courts, dates, case types, judges
• 1.5 million commercial cases, 90,000 unique firms

Orbis database
• Annual data from 275 million firms (assets, revenues, wage bills, labor, stock valuation)
• 345,000 Croatian firms of which 73,000 firms match with ICMS data

Other sources:
• WB/MOJ surveys, MOJ administrative & budget data

GDP (2013): € 47.8 billion
Case backlog (2013): € 24.8 billion
India Justice Data

- **National Judicial Data Grid:**
  - Scraped and digitized over 20 million cases and 70 million hearings from lower courts
  - Use simple parsing and machine learning techniques to construct structured metadata on courts, dates, parties, case types, judges, etc.

- **Indian Kanoon:** legal search engine for appellate court cases (http://indiankanoon.org)
  - Over 4 million high court judgements across 24 High Courts over 81-year period
  - Fully digitized text of published judicial opinions
  - Structured metadata on court, case title/citation, dates, judges on panel, authoring judge

- **Other sources:**
  - Websites of Supreme Court, Ministry of Justice
  - Association for Democratic Reform, Anthropological Survey of India
THE POWER OF DATA ANALYTICS
Croatia Data Analytics

• Map out the relationship between
  – court speed, &
  – firm stock valuation & revenue growth

• Map out, for each county, the stock price and revenue elasticity of court speed, to see where investing in speeding up courts give the highest returns for firms
A case for Justice Reform (Siddiqi 2018)

The faster the judge the higher are firm stock prices and revenues
Targeting regions where firms will gain the most from faster justice
Judges close more cases towards end of the month

This is true for most months, but not July or December

Note: we base this analysis on data for 2010-2015 (only years when full data is available).
Measuring quality: Are judges in India biased?

Upper caste Hindu defendant

Muslim defendant

Lower caste Hindu defendant

Word cloud:
- Measuring quality: Are judges in India biased?
- Upper caste Hindu defendant
- Muslim defendant
- Lower caste Hindu defendant
- Words: conscientious, resourceful, resourceful, real, characteristic, intelligent, steady, engaging, participative, astute, judicious, deliberate, consistent, principled.
IE led to adoption of new delivery mechanism
68% government score

<table>
<thead>
<tr>
<th>Government/Implementing Agency</th>
<th>Yes</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB Operations TTL</td>
<td>79%</td>
<td></td>
</tr>
<tr>
<td>IE TTL</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>All</td>
<td>60%</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment arm</th>
<th>Other IE element</th>
</tr>
</thead>
<tbody>
<tr>
<td>56%</td>
<td>0%</td>
</tr>
<tr>
<td>58%</td>
<td>25%</td>
</tr>
<tr>
<td>0%</td>
<td>10%</td>
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<td>50%</td>
<td>60%</td>
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<tr>
<td>60%</td>
<td>70%</td>
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</table>
Tax nudges in Tanzania significantly increase payment rates - reciprocity, social pressure, reminder, enforcement
Reducing the cost of information increases knowledge if civil servants face strong managerial incentives.

- Officials make large errors about conditions: 39% claim their district’s population is 50% bigger or smaller than it is.
- Randomly reducing the cost of access significantly improves information on average (third of a standard deviation).
- Treatment effects are positive only where management practices are strong.

Randomized control trial at the office level and survey data assessing bureaucrat information.

Information important for efficient public-resource distribution and policy decisions.
IE led to scale up or down 58% government score

- Government/Implementing Agency: 58%
- WB Operations TTL: 13%
- IE TTL: 57%
- All: 47%

[Bar chart showing the percentage of respondents who know whether IE led to scale up or down their government score, with 'Yes' in blue and 'Don't Know' in red.]
Impact Evaluation of the Urban Local Government Strengthening Program

• Provided performance grants & capacity building to selected LGAs
• To improve service delivery, lower corruption and improve citizens satisfaction
“Treated” LGAs improve 😊
But so do comparison LGAs
Difference in Difference shows treated LGAs did not do any better 😞
Take aways

• Data and evidence is the next best investment
  – Improves the speed of project implementation and its efficiency
  – Influences decisions at all stages of design and implementation and increases effectiveness of reforms

– The costs of IE are tiny relative to the gains
Thank you!