The findings, interpretations, and conclusions expressed here are entirely those of the author. They do not necessarily represent the views of the World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent. Thanks to Eva Davoine for research assistance.
Overview: Tax Systems and Development
Key Functions of the Tax and Transfer System

1. Invest in public goods

2. Redistribute & reduce inequality

3. Provide insurance

4. Correct externalities
Lower Income Countries Collect Less Taxes

Source: ICTD/UNU-Wider "Government Revenue Dataset" 2020 & WDI.
Regional Differences in Tax Revenue

Source: ICTD/UNU-Wider "Government Revenue Dataset" 2020 & WDI.
Differences in Tax Instruments

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Source: ICTD/UNU-Wider "Government Revenue Dataset" 2020 & WDI.
Differences in Tax Instruments

![Graph showing tax revenue with social contributions (% of GDP) for different income groups.](source)

**Taxes on:**
- Trade
- Corporations
- Consumption
- Payroll
- Personal Income
- Property & Other

**Source:** ICTD/UNU-Wider "Government Revenue Dataset" 2020 & WDI.
Should Tax Revenue Increase be an Objective?

- Many countries still collect under 15% of GDP in taxes, an insufficient level to meet the SDGs (Adis UN Summit 2015).

- Current crisis ↑ demand for social insurance and puts pressure on governments’ fiscal position.

- Important to design taxes which do not impede growth:
  - Few growth success stories without increasing size of state.
  - Government’s leakage to be balanced against high(er) returns to investment and needs for redistribution.
  - Improved taxation can spur accountability & better governance.
Taxation is Constrained by what Governments can Observe

Modern tax systems rely on self-reported activity, which is cross-validated with third-party reported data:
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![W-2 Wage and Tax Statement](image-url)
Taxation is Constrained by what Governments can Observe

Modern tax systems rely on self-reported activity, which is cross-validated with third-party reported data:

<table>
<thead>
<tr>
<th>Employee identification number (EIN)</th>
<th>11-2233445</th>
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</thead>
<tbody>
<tr>
<td>Employer’s name, address, and ZIP code</td>
<td></td>
</tr>
<tr>
<td>The Big Company 123 Main Street Anywhere, PA 12345</td>
<td></td>
</tr>
<tr>
<td>Employee’s name, initial Last name</td>
<td>Jane A DOE 123 Elm Street Anywhere Else, PA 23456</td>
</tr>
<tr>
<td>State Employer’s state ID number</td>
<td>PA 1235</td>
</tr>
<tr>
<td>State wages, tips, etc.</td>
<td>$50,000</td>
</tr>
<tr>
<td>State income tax</td>
<td>$1,535</td>
</tr>
<tr>
<td>Local wages, tips, etc.</td>
<td>$50,000</td>
</tr>
<tr>
<td>Local income tax</td>
<td>$750</td>
</tr>
</tbody>
</table>

- Information is limited in economies with self-employment, short production chains, and incomplete accounting records.
Taxation is Constrained by Administrative Capacity

Modern tax administrations use efficient databases and risk algorithms, and are incentivized to detect tax evasion.
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- Weak administrations: IT systems & departments not integrated, few incentives for tax inspectors, difficulties to apply the law.
Trade-offs in Tax Policy Design

Textbook equity-efficiency trade-off needs to also consider information and capacity constraints ⇒ “third-best” policies:

▶ Consumption tax: VAT preferred to sales tax, but only with sufficient admin capacity (Pomeranz 2015, Waseem 2020).

▶ Corporate tax: preferable to tax SMEs on their turnover rather than on their profits (Best et al. 2015; Bachas and Soto 2018).

Today:

▶ Audit efforts often focus on large firms: what is the impact on aggregate production? (Bachas, Fattal-Jaef, and Jensen 2019)

▶ Are consumption taxes regressive in economies with large informal sectors? (Bachas, Gadenne, and Jensen 2020)
Size-Dependent Taxation
(Bachas, Fattal & Jensen, JDE 2019)
Size-Dependent Tax Inspection

Context:

▶ Administrative constraints lead to governments only enforcing taxes on large firms.

▶ This produces a **size-dependent tax** which could limit firm growth and produce misallocation of resources across firms.
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- To what extent is tax enforcement size-dependent?
- What are the implications for aggregate productivity?
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Data:
- WBES 2003-2015: 125k firms in 140 countries.
- Use questions on tax inspection and on tax compliance.
- Take averages at narrow industry level.
Industry Size Rank and Tax Inspection

Empirical Strategy: Estimating the Size-Dependent Tax

Issue with OLS:
- Observed firm size might be distorted by enforcement.

Potential Solution:
- Proxy for optimal size in a context with few distortions.
- \[ \Rightarrow \] Take the average size of the same industry from US census data (similar to Rajan and Zingales 1998).

What the IV concretely does:
- 1st stage: US industry size predicts size of same industry in WBES countries.
- 2nd stage: Predicted value regressed on average inspection of that industry in each WBES country.
Results

Firms in an industry with avg of 50 workers compared to firms in an industry with avg of 25 workers:

▶ Face a 6% higher probability of tax inspection (mean 61%).
▶ Report 5.5% more sales to tax authority (mean 81%).

These results are robust to many specifications:

▶ Using variation only between narrow industries (ISIC-3).
▶ Controls (e.g. capital intensity).
▶ Relying on the panel dimension of the data.
Results Across Countries by Income Groups

Source: Bachas, Fattal-Jaef & Jensen (JDE 2019)
In our model (based on Atkeson and Burstein 2010), firms of different productivity choose as a function of their effective tax rate:

- Their production and number of workers.
- Their investment/innovation spending.
- If they want to enter or exit the economy.

**Question**: what happens to aggregate productivity (measured as TFP) if we remove the size-dependent tax?

**Counterfactual**: All firms face the median enforcement intensity.

**Calibration**: technology parameters match firm-level properties of “undistorted” economy (US). Size-dependent rates from our data.
Removing Size Dependent Taxes: Mechanisms

Source: Bachas, Fattal-Jaef & Jensen (JDE 2019)
Removing Size Dependent Taxes: Impact on Firm Size

Source: Bachas, Fattal-Jaef & Jensen (JDE 2019)
Removing Size Dependent Taxes: Impact on TFP

Source: Bachas, Fattal-Jaef & Jensen (JDE 2019)
Conclusion: Size-Dependent Taxation

1. Size-dependent enforcement stronger in lower income countries.

2. Combine data and model to shed light on aggregate implications of removing size-dependent taxation:
   - The avg firm size increases substantially (+30%)
   - Aggregate productivity gains are moderate (+1%):
     - Improves static allocation & fosters innovation.
     - But leads to higher exit rates, and less entry of small firms.
Informality, Consumption Taxes & Redistribution
(Bachas, Gadenne & Jensen, NBER WP 2020)
Consumption Taxes & Redistribution

In LMICs bleak view of tax systems’ capacity to reduce inequality:

- Personal income taxes collection is limited (Jensen 2019).
- Consumption taxes, considered regressive, =50% of all revenue.
Consumption Taxes & Redistribution

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- Consumption taxes, considered regressive, =50% of all revenue.

Question: can taxes on consumption redistribute, and how?

- "Old” rate differentiation channel: setting reduced rates for necessities (food).
- "New” informality channel: consumption in the informal - untaxed - sector may vary with income.
Data and Methodology

31 household expenditure surveys (400k households):
- Income levels: from Burundi to Chile.
- Open diaries of consumption with coverage of all products.
- Place of purchase variable for each purchase.

Taxes paid on purchases are not observed in expenditure surveys. To proxy for formality use place of purchases (Lagakos 2016)

- Traditional sector: home-production, non-brick-and-mortar, convenience stores, services from individual providers.
- Modern sector: specialized stores, large stores, institutional services.

Assumption: purchases in small-scale traditional sector do not pay consumption taxes, de-jure or de-facto.

Note: traditional sector could pay taxes through production chain, adjustments in paper.
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Aggregate Share of Informal Consumption on GDP pc

Source: Bachas, Gadenne & Jensen (NBER WP 2020)
Lowess fit on household data, ENIGH 2014 (N= 19,479). Source: Bachas, Gadenne & Jensen (NBER WP 2020)
Slopes of Informality Engel Curves Across Countries

- For each country $\hat{\beta}$: \( Share\ Informal_i = \beta \ln(income\ pp)_i + \varepsilon_i \)

Source: Bachas, Gadenne & Jensen (NBER WP 2020)
Implications for the Progressivity of Consumption Taxes

Progressive tax: tax rate $\uparrow$ with household’s income/expenditure.

$\Rightarrow$ Consumption taxes are progressive if items consumed disproportionately by the poor are exempted (e.g. traditional, food)

Mechanical simulation with tax revenue collected $= 10\%$ of GDP:

1. Uniform tax rate which applies only to modern sector
2. Food exempted but both modern and traditional taxed
3. Food exempted and only modern sector taxed
Average Progressivity of Consumption Tax Policies

Source: Bachas, Gadenne & Jensen (NBER WP 2020)
Average Progressivity of Consumption Tax Policies

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Source: Bachas, Gadenne & Jensen (NBER WP 2020)
Progressivity & GDP pc: only Modern Sector Taxed

Source: Bachas, Gadenne & Jensen (NBER WP 2020)
Optimal Consumption Taxes with Behavioral Responses

Commodity tax model (Diamond 1975) with different varieties:

- As consumers get richer consume more modern (taxed) varieties.
- Consumers respond to taxes: higher rates lead to more substitution from modern to traditional varieties.

Question: How do optimal tax rates change with development?

Calibration: use our data patterns, product elasticities & substitution elasticities from literature (Atkin et al. 2018; Faber and Fally 2017).
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- Efficiency pushes tax rates ↓
- Equity pushes tax rates ↑
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Results: Tax Rates on Food relative to Other Products

(a) Counterfactual: all varieties taxed

(b) Only modern varieties taxed

Source: Bachas, Gadenne & Jensen (NBER WP 2020)
Results: Inequality Reduction

Panel A: Simulated Optimal Consumption Taxes (This paper N=31)
- Uniform rate, only formal taxed
- Food rate differentiation, formal and informal taxed
- Food rate differentiation, only formal taxed

Panel B: Studies Using Current Tax Policies (CEQ N=25)
- Indirect taxes: General consumption & excise
- Direct taxes: PIT & Social Security

Source: Bachas, Gadenne & Jensen (NBER WP 2020) & Commitment to Equity.
Extensions & Limitations

- Pass-through of taxes to the traditional sector:
  - Adjust results using Mexico’s census data where all firms report VAT paid on inputs and on output.
  - Our ongoing micro-study finds no pass-through of an increase in VAT on prices of informal retailers in Mexico.

- Incidence entirely born by consumers. If falls also on workers (profits), then need to know who works (owns) in formal firms.

- Distributional savings.

- Rate differentiated across 12 COICOP2 goods.

- Absence of a personal income tax.
1. Consumption taxes perform non-trivial redistribution in LMICs.

2. Should enforcement stop focusing on the informal sector?
   - No! fairness concerns, efficiency.
   - But equity case to exempt small firms de-jure from taxes.

3. Should food (necessities) be exempted from taxes?
   - Hard to justify on equity grounds in poor countries.
   - Stronger case as countries get richer, but then Personal Income Tax should perform the redistribution.
More Tax Research and How to (try to) Impact Policy
Exciting Literature using Program Evaluation Approach

Fast developing complementary approach:

- How to improve taxation by tweaking policies & incentives?

Some examples:

- Tax lotteries help with final stage reporting but at large cost (Naritomi 2019).
- Electronic filling has no impact on reported taxes but levels the playing field between high & low evasion risk firms (Okunogbe and Pouliquen 2018).
- Performance pay for tax inspectors lead to higher tax revenue but also more bribes (Khan, Khwaja, and Olken 2016).
- Broadening the property tax base encourages more citizens to participate and monitor local governments (Weigel 2020).
Research and WB’s Opportunity to Shape Tax Policy

LMICs’ tax policies face information & capacity constraints:

▶ Research can help tailor tax design, given these constraints.
▶ Data & technology promise to help.

Encourage use of tax admin. data, set standards & provide evidence:

▶ Current crisis:
  ▶ Tax data can document in real time the economic situation.
  ▶ Design and evaluation of emergency tax relief & social transfers.
▶ Aftermath will require ↑ revenue, achieved equitably:
  ▶ International tax architecture to adapt to MNEs & digitization.
  ▶ Taxes on income and wealth in a globalised economy.
  ▶ Environmental taxation.
THANK YOU

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Bibliography


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