Does the PNG government get its fair share from the resource sector?

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Plan for Today

1. Theory
2. Data
3. Policy Implications
   - resources fiscal regime
   - economy-wide
Motivation: why are we looking at this

• Why are we looking at this?
  • PNG
  • Lack of data availability (previous project)

• What are we doing?
  • New database: EITI
  • Theoretical model
  • Empirical analysis (to come): examine government take controlling for
    • factors which influence the bargain between Govt and MNC
    • profit related variables (cost, prices)
1. Theory
1. Bargaining game: Division of gains between two parties

- Two parties: Government, MNC

Dividing profit: you get more, I get less

Profit, $\pi$

Profit, $\pi = \pi_G + \pi_{MNC}$
Nash bargaining framework

• Total Rents, \( \pi \)
  \[ \pi = P \cdot Q - C(Q) \]

• \( P \) = price of resources
• \( Q \) = quantity of resources
• \( C(Q) \) = cost of producing given quantity of resources, \( Q \)
• In event of bargain, rents are distributed
  \[ \pi = \pi_G + \pi_{MNC} \]

• \( \pi_G \): government profit, if bargain takes place
• \( \pi_{MNC} \): MNC profit, if bargain takes place
Nash bargaining framework

\[ B = (\pi_G - \pi_G^*)^\alpha (\pi_{MNC} - \pi_{MNC}^*)^{1-\alpha} \]

Solution: Government share = \( \frac{\pi_G}{\pi} = \alpha \left[ 1 - \frac{\pi_{MNC}^*}{\pi} \right] + (1-\alpha) \left[ \frac{\pi_G^*}{\pi} \right] \)

- Depends on
  - \( \pi_G \): what government gets if bargain takes place
  - \( \pi_G^* \): what government gets if bargain breaks down
  - \( \pi_{MNC} \): what MNC if bargain takes place
  - \( \pi_{MNC}^* \): what MNC gets if bargain breaks down
  - \( \alpha \): bargaining strength of government, 1-\( \alpha \): bargaining strength of MNC

- Participation Constraints: \( \pi_G > \pi_G^* \quad \pi_{MNC} > \pi_{MNC}^* \)
Nash bargaining framework

• Government gets better deal if
  • Outside option better: $\pi^*_G$ higher
  • Bargaining strength, $\alpha$, higher (less impatient)

• MNC gets better deal if
  • Outside options better: $\pi^*_\text{MNC}$ higher
  • Bargaining strength, $(1-\alpha)$, higher

• $\uparrow \pi^*_G \rightarrow$ increase in government share
• $\uparrow \pi^*_\text{MNC} \rightarrow$ decrease in government share
• $\uparrow \alpha \rightarrow$ increase in government share
Simple example

- Two people, Rachael and Hane, dividing a pizza of size 1
- If they can’t agree on a way to split it, it disappears
- Outside option: each has ¼ of a pizza at home
- Each has equal bargaining strength: $\alpha = \frac{1}{2}$, $1-\alpha = \frac{1}{2}$

Rachael’s share = \( \frac{\pi_R}{\pi} = \alpha \left[ 1 - \frac{\pi_H^*}{\pi} \right] + (1-\alpha) \left[ \frac{\pi_R^*}{\pi} \right] \)

= \( \frac{1}{2} \left[ 1 - \frac{1/4}{1} \right] + \left( \frac{1}{2} \right) \left[ \frac{1/4}{1} \right] = \frac{1}{2} \)

- Similarly, Hane’s share = \( \frac{1}{2} \)

Suppose Rachael’s bargaining strength increases to $\alpha = \frac{3}{4}$ then Rachael gets 0.625, and Hane 0.375

Suppose Hane has 3/4 of a pizza at home: Rachael gets 0.25 and Hane 0.75
Outside options

What does $\pi_G^*$ depend on:
• Capacity to do the project yourself – nationalize:
  • if you can’t nationalize you get zero, but
• Leave it in the ground
  • Defer exploitation now to future

What does $\pi_{MNC}^*$ depend on:
• Projects in other countries (profits elsewhere relative to here)
• Fear of break-down in negotiations and another MNC getting project
Bargaining strength

Governments bargaining strength, \( \alpha \), depends on:

- Accountability to people – pressure to push for better deal
  - Increase transparency
  - Higher transparency \( \rightarrow \) push for better deal

- Political risk
  - Increased likelihood of disruption of project \( \rightarrow \) decreases \( \alpha \) \( \rightarrow \) MNC better deal

- Corruption
  - Decrease \( \alpha \)

- Bureaucratic ability
  - Less able bureaucracy \( \rightarrow \) less effective at negotiations \( \rightarrow \) lower \( \alpha \)

MNC’s bargaining strength \((1 - \alpha)\) depend on:

- Number of competitors (even if collaborating)
- Sunk costs (exploration, construction)
  - How heavily invested is mnc?
What does model say about how to bargain?

• Improve your outside options
• Increase your bargaining strength

• $\uparrow \pi_G^* \rightarrow$ increase in government share
• $\uparrow \pi_{MNC}^* \rightarrow$ decrease in government share
• $\uparrow \alpha \rightarrow$ increase in government share

• “We can’t wait too long before our place in the queue slips.”
  - Peter Botten, June 2019 (reminder: outside options)
2. Data
Data on resource revenue

This is a cross-country research project.
Motivation: Lack of readily available data on countries’ resource tax revenue

• Recently, International Centre for Tax and Development (ICTD) released a cross-country database on tax revenues, including from resource sector.
• ICTD is mostly based on IMF Article IV reports.
• Reasonably long time series, but numbers typically come from budgets, no breakdown of payments, and not clear if accurate.
Our database

• Based on Extractive Industries Transparency Initiative (EITI) annual reports

• EITI: Formed in 2003, 52 member countries currently, seeks to address governance and transparency issues in resource sector.

• Among others, annual EITI reports publish detailed information on government tax revenues from the extractives sector.

• We collect this information where possible for the 52 member countries plus former ones such as Azerbaijan, Niger, US, and Yemen.

• Sample period 2004-2017

• Data quality often seems questionable in earlier years.

• Best to restrict sample period to 2009-2017.
• We report resource revenues grouped into the following categories:
  • Total resource revenue
  • Corporate income tax (CIT)
  • Royalties
  • Payments associated with state ownership (Equity)
  • Production sharing agreements/contracts (PSA/PSC)
  • Social contributions (incl. salary and wage tax)

• Other payments not reported separately:
  • VAT/GST
  • Bonuses, e.g. signature bonus
  • License fees
  • Dividend or interest withholding tax
  • Import duties
  • Others
PNG’s fiscal regime (simplified)

Revenue from commodity sales

- Royalty 2%, Prod. levy 0.25-0.5%
- Wellhead value (oil and gas)
  - Royalty, 2%, Development levy 2%
  - Taxable income to investors
    - Income tax 30%
    - After-tax profit
      - Gov’t equity
      - Investor’s dividends
        - Withholding tax 15%
        - Investor’s net dividends

Government revenue

- Investor’s return

Production Cost

- Salary and wage tax, import tax, and GST (mostly zero rated)
Mongolia: Mining fiscal regime

Source: Namkhajantsan and Schröder (2019)
EITI’s and our approach

- EITI determines material payments and reporting entities (companies and government agencies)
- EITI sends out templates to companies and government agencies
- Next, payments of reporting companies are compared against government and differences reconciled.
- We use reconciled revenues reported by government.
- In most cases, >95% of revenues are reconciled and remaining differences very small (<1% of total).
- Exceptions are highlighted in the dataset.
- Often judgment calls are needed in terms of payment classification.
- Large variety in terms of reporting style, consistency, and apparent data reliability.
Categorized payments from EITI reports

CIT
- Petroleum Revenue Tax
- Ring Fence Corporation Tax
- Impôt sur les bénéfices industriels et commerciaux
- Impôt sur les sociétés
- Income tax on equity
- Profit tax
- Corporate income tax
- Excess Profit
- Impuesto a la Renta

Royalties
- Oil royalty
- Mining royalty
- Taxe d'exploitation pétrolière
- Taxe à l'extraction des substances minières
- Ristourne Minière
- Taxe Spéciale sur les Produits Miniers (TSPM)
- Vente du pétrole de la redevance sur la production par la SHT (chad)
- Regalías Mineras
- Regalías de Hidrocarburos
- Fee for the use of subsurface resources

State Ownership
- Profil Oil Etat
- Puissance Publique
- Dividends
- Dividendes versés à l'état
- Direct and indirect transfers of SNH

PSA/PSC
- Share of Pre-existing production
- Share of contractors own production
- Government Lifting Oil
- Sales Revenue Share

Social Contributions
- Pay as you earn (PAYE)
- Impôt sur le revenu des personnes physiques (IRPP)
- Impôt sur les salaires
- Impôt sur les traitements et salaires
- Cotisations sociales
- Payments for social and health insurance and personal income tax
- Payroll Tax

Source: Authors
PNG and some international data
Tax revenue from resource sector in 2017

Source: EITI 2017 data
PNG government’s total resource revenue

Source: IMF and EITI
Estimate of PNG government’s take (% resource GDP)
Government take: Int’l comparison

Note: Calculations are based on EITI data excluding social contributions.

Source: Authors
# Payment types: International comparison

<table>
<thead>
<tr>
<th>Country</th>
<th>Corporate Income Tax</th>
<th>Royalties</th>
<th>Gov’t Equity</th>
<th>Social Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papua New Guinea</td>
<td>5%</td>
<td>11%</td>
<td>28%</td>
<td>33%</td>
</tr>
<tr>
<td>Mongolia</td>
<td>19%</td>
<td>37%</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>Timor Leste</td>
<td>14%</td>
<td>58%</td>
<td>0%</td>
<td>16%</td>
</tr>
<tr>
<td>Chad</td>
<td>2%</td>
<td>38%</td>
<td>37%</td>
<td>7%</td>
</tr>
<tr>
<td>DR Congo</td>
<td>30%</td>
<td>10%</td>
<td>4%</td>
<td>10%</td>
</tr>
<tr>
<td>Cote d’Ivoire</td>
<td>3%</td>
<td>16%</td>
<td>57%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Note: Data based on most recent available sample year.
Source: EITI
Does the PNG government get a fair share?

• Two ways to read the data on PNG
  • Low take (even lower than DRC) suggests “no”
  • However, fall in commodity prices and stage of resource projects in the country can explain the low take in recent years.

• Not possible to reach a definitive conclusion.

• Ongoing research: Regression analysis that controls for determining factors of government take, i.e. bargaining power, commodity prices, costs, stage of resource projects, and others.

• Overall, data suggests there is back-load in fiscal take from resource projects.

• This is not “fair” or “unfair”, but a suboptimal outcome for any developing country.
3. Policy recommendations: Fiscal regime

- PNG is a developing country which means funds for crucial spending such as infrastructure, health and education are needed today rather than tomorrow. Therefore, avoid deals with MNCs that lead to extreme back-load of fiscal take.

Some options for generating more upfront payments from future resource projects:

- Reduce incentives (loss carry forward arrangements, tax concessions, treating royalties as advance income tax, etc.).
- Reconsider zero rating GST. Many resource rich countries derive significant revenue through GST. It is also relatively easy to administer.
- Relying more on royalties on sales. They have other advantages
  - More stable than income tax and other payments
  - Relatively easy to administer

- General: There seems no mechanism for gov’t to benefit from exceptionally high commodity prices (e.g. additional royalty, excess profit tax)

- As our model suggests, achieving such outcomes depends on relative bargaining power and every party has outside options.
Policy recommendations: Economy-wide

• Better macro policy: change mindset: “need the next resource projects to save us”

• Less dependence on resources sector for:
  • Growth
  • Revenue
  • Foreign exchange

• Better policies in non-resource sector
  • Agriculture, tourism

• Improve your outside options → increase $\pi_G^*$

• Less dependence also decreases impatience → increase $\alpha$

• Lower political risk and reduce corruption → increase $\alpha$

• Stable political regime
  • Lower political risk → increases $\alpha$

• Stable policies towards MNCs
  • Encourage entry of MNCs → more competition → reduces MNCs bargaining strength → increases $\alpha$

• Remember: leaving it in the ground for future exploitation is a valid option
Policy recommendations: Economy-wide (ctd)

- Developing Countries
  - rates of return in investment in education, health, infrastructure are high
  - Limited ability to borrow against future tax revenue

- Impatience: exploit resource now

- But institutional capacity to spend it is low
  - if do it now, save it now and spend it later
  - do it later