# Contracts and Corruption
# Evidence from Pakistan's power sector

Tim Dobermann (LSE) Faraz Hayat (Chicago/LSE)
Sugandha Srivastav (Oxford)

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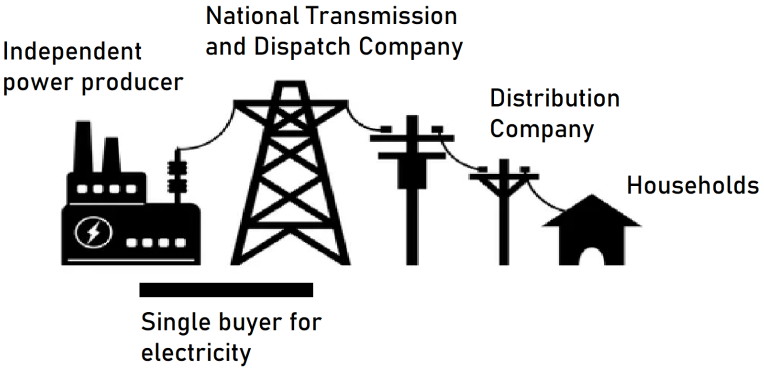
# This paper is about contracts and corruption in the power sector


- **Liberalised markets**: buyers and sellers transact frequently and transparently
- **Developing countries** use long-term contracts
- **Long-term contracts** reduce risk but more susceptible to rent-seeking

# The Pakistani power market has a single public buyer for electricity

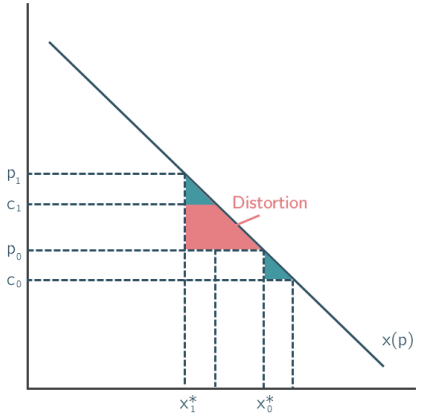



The central power purchasing authority buys electricity from IPPs (independent power producer).

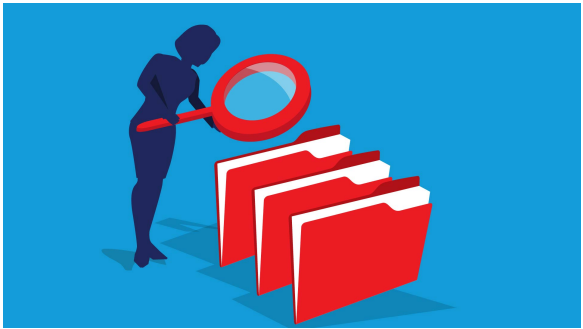
# Power contracts are bilaterally negotiated between the government and independent power producers


Without competitive procurement - asymmetric information, rent-seeking.

# Without competitive procurement, it is very hard to know if the contracts are cost-reflective or if they embed a mark-up



# Negotiated power contracts are used across the developing world but are rarely disclosed



Desperate need for transparency given power contracts represent significant use of public funds.

# What we do in a nutshell

1. ***Reveal*** the terms and conditions of the universe of long-term power contracts in Pakistan
2. **Reveal** the owners of these power contracts and check if more politically connected independent power producers get more generous terms
3. ***Develop*** a model to think about the minimum incentive required for investment
4. ***Size*** the mark-up charged by independent power producers ("the political economy premium")
5. ***Estimate*** the economic costs of this mark-up

Today we will focus mostly on 1-2 but more work to come on 3-5. Stay tuned!

# We spent one year to systematically build a database of all power contracts in Pakistan

The National Electric Power Regulatory Authority keeps a record of all PPAs

1. 170 primary power purchase agreements
2. 6,205 amendments
3. Trace the evolution of 26 unique variables over 25 - 35 years

The universe of of privately procured electricity in Pakistan.

We are the first to compile such data for a country. Took 1 year + five people to compile database

# This required manually scanning thousands of pdfs and pulling out key variables

**Reference Tariff for 660 MW**
**Imported Coal on Foreign Financing**

| Tariff Components | Years | |
|---|---|---|
| **Capacity Charges (PKR/kW/Hour** | **1-10** | **11-30** |
| Fixed O&M - Local | 0.1435 | 0.1435 |
| Fixed O&M - Foreign | 0.1435 | 0.1435 |
| Working Capital | 0.2276 | 0.2276 |
| Insurance | 0.1021 | 0.1021 |
| Return on Equity | 1.1872 | 1.1872 |
| Debt Servicing | 1.6691 | 0.0000 |
| **Total Capacity Charges** | **3.4731** | **1.8040** |
| **Energy Charges Rs./kWh** | | |
| Fuel cost Component | 4.2913 | 4.2913 |
| Ash Disposal | 0.2200 | 0.2200 |
| Lime Stone | 0.0900 | 0.0900 |
| Variable O&M - foreign | 0.0684 | 0.0684 |
| Variable O&M - Local | 0.0456 | 0.0456 |
| **Total Energy Charges** | **4.7153** | **4.7153** |

**xii) Return on Equity (ROE)**

**The Return on Equity shall be 27.2%.**

# Contracts in the power sector are highly lopsided with most risk being transferred from the IPP to the government

Features of all contracts:

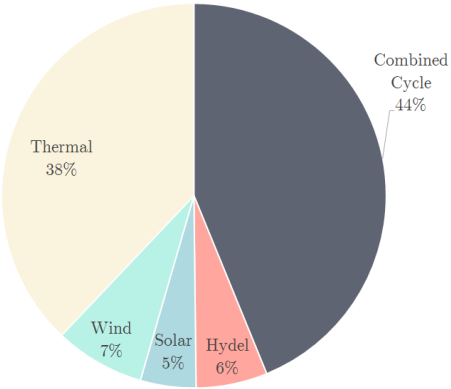
1. Long-term: 24-35 years
2. Take-or-pay
3. Payment for generation and fixed payment for capacity
4. Guaranteed return on equity
5. Cost-plus
6. Insulated against many forms of market movements

# Independent power producers get generous indexation against local inflation, foreign inflation and currency risk

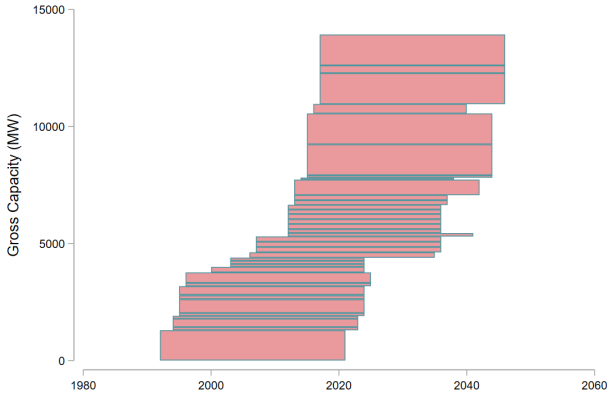
During life of the project operations, Quarterly adjustments/indexations for local inflation, foreign inflation, exchange rate variations and interest rate variations will be made on 1st July, 1st October, 1st January and 1st April each year based on latest

| Tariff Components | Tariff Indexation & Adjustment |
|---|---|
| Fuel Cost component | Delivered Fuel Price (inclusive of transportation) at the Power Plant |
| Variable O&M (Foreign) | US$ to Pak Rupees & US CPI |
| Variable O&M (Local | Pakistan CPI |
| Fixed O&M (Foreign) | US$ to Pak Rupees & US CPI |
| Fixed O&M (Local | Pakistan CPI |
| Cost of Working Capital | Adjustments for relevant KIBOR variations |
| Return on Equity | US$ to Pak Rupees |
| Principal Repayment (Foreign Currency | US$/Euro/Yen/Pound to Pak Rupees (based on borrowing by the Company) |
| Interest//Mark-up Payments (Foreign Currency Loan) | • Adjustments for relevant LIBOR or other applicable Interest Rate benchmark<br>• Adjustment for variation in Rs./Foreign Currency (US$/Euro/Yen/Pound) rates as applicable |
| Interest/Mark-up Payments (Local Currency Loan) | Adjustments for relevant KIBOR variations |

# Contracts mostly support fossil fuels

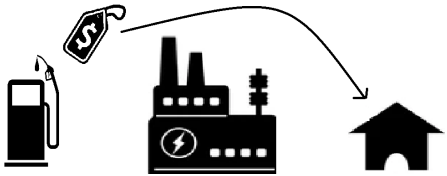


# These contracts are extremely long-term, locking in expensive dirty generation for decades to come




This reduces the scope to integrate new clean power.

# Independent power producers can pass on all increases input costs since contracts are cost-plus



Pakistan imports large quantities of fuel and is exposed to international price fluctuations, all of which are passed on to the citizens.

1. No incentive for the generator to be efficient
2. Incentive to artificially inflate costs and earn supernormal profits

# Fuel supply contracts import extremely expensive coal because all of these costs can be passed on

Top Story

## Sahiwal power plant: Inquiry into coal purchase contract corruption allegations launched

Despite these concerns, the economic burden of price discrepancies, resulting in additional monthly costs of multi-billion rupees

By Our Correspondent | March 12, 2024

Coal purchased at $400 per ton for Sahiwal Coal Power Plant while market price actually $100 per ton

# Price hikes due to fuel cost increases

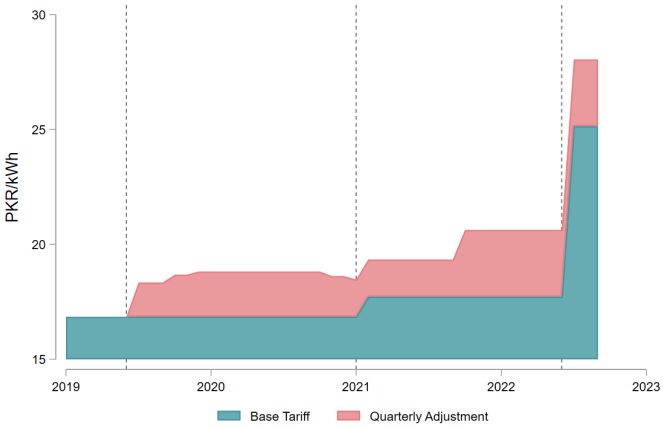
## Pakistan's power regulator raises electricity rates citing fuel cost adjustments

Updated 07 June 2024

KHURSHID AHMED

- Rs3.33 per unit hike is expected to allow ex-WAPDA electricity distribution companies to raise $101.4 million
- Electricity consumers in Karachi will pay an additional Rs2.68 per unit for power consumption in April 2024

# Because of these terms, power prices have risen substantially



# Independent power producers get paid a fixed capacity payment in addition to a generation payment

Fixed payment creates incentive for over-building (installed capacity 42 GW, demand 31 GW)

**Capacity payments greater than annual health, education and social care budget**

Power and gas circular debts = 5% of GDP (World Bank 2024)

# Is there evidence of corruption in these contracts?

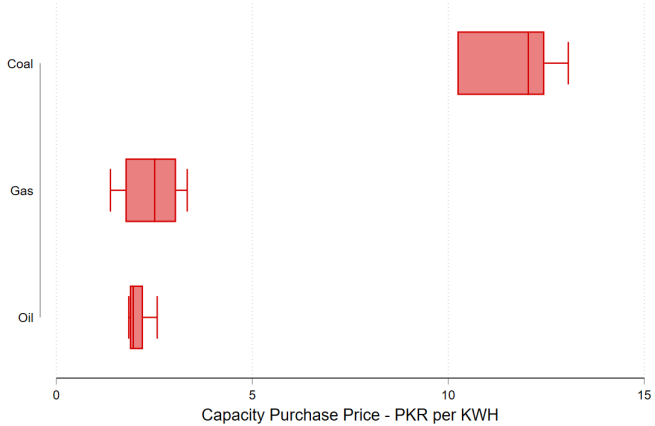
There are two ways to cheat:

1. Explicit cheating: deviating from the signed terms and conditions from the contract
   - Audit reports reveal that IPPs are artificially inflating their costs since cost-plus contracting allows all costs to get reimbursed (Return on equity 60%, fixed costs recovered in 2 years, etc.)
2. Implicit cheating: signing an extremely lopsided contract that does not reflect fair value
   - Guaranteed return on equity up to 30% in Pakistan plus generous forms of indexation and cost-pus contracting (India 15.5%, Nepal 17%, Bangladesh 15%)
   - Modelling will be used to illustrate extent to which Pakistan PPAs deviate from “market value”

# Let's look at whether coal projects in Pakistan received contracts that were more favourable

- All coal in China built under auspices of China Pakistan Economic Corridor
- Government-to-government negotiations
- No competitive procurement
- Lack of foresight - solar soon to be cheaper and coal import prices to rise

# Chinese coal gets the most generous fixed payments



# Chinese coal gets a high guaranteed return on equity

# Chinese coal gets a premium tariff (25% higher)

| ppp | Coefficient | Robust std. err. | t | P>\|t\| | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| cpec | 6.51136 | .7109128 | 9.16 | 0.069 | -2.521644 | 15.54436 |
| policy2015 | -7.139706 | .9489616 | -7.52 | 0.084 | -19.19741 | 4.917994 |
| plant_load | .2244259 | .0237414 | 9.45 | 0.067 | -.0772371 | .5260889 |
| net_capacity | -.011351 | .000142 | -79.93 | 0.008 | -.0131555 | -.0095466 |
| efficiency | .7364197 | .0018723 | 393.32 | 0.002 | .7126296 | .7602098 |
| _cons | -31.51212 | 1.776816 | -17.74 | 0.036 | -54.0887 | -8.93553 |

# There are also other avenues for corruption - textile lobby

A case of double dipping uncovered:

- Textile companies ask for subsidies citing high electricity prices
- Textile companies own the independent power producers that have generous contracts leading to high power prices

**Coasian bargaining** only efficient if the government actually represents the citizens best interests. However, these contracts raise a real concern on whose interests the government is representing.

The market/competitive procurement safeguards against this!

# Summary

- Generous contract terms - guaranteed return on equity, indexation against many forms of risk and cost-plus contracting.
- No competitive procurement implies no benchmark against which we can assess if these terms are cost-reflective.
- Statistically significant premium for Chinese-backed power projects.
- By using these contracts, Pakistan is locking in dirty and more expensive energy for decades to come

Next steps: size the premium in Pakistan relative to similar countries with competitive procurement, quantify impact on electricity prices and finally, measure impact on economic outcomes.

Feedback? Get in touch: sugandha.srivastav@smithschool.ox.ac.uk