Oil sector in Mexico: Challenges and opportunities for economic growth and social equity

Preliminary results, FoReSee case study
Overview

1. Pemex: Between a rock and a hard place
2. The 2013 energy reform
3. Recent developments
4. Prospects: O&G as a sustainable source of income and growth?
Pemex: Between a rock and a hard place

The 2013 energy reform

Recent developments

Prospects: O&G as a sustainable source of income and growth?

Figure 1: Old filling Pemex station, 1956, from Fortune Magazine

Figure 3: Fortune’s magazine on Pemex, 2014

Figure 2: Former Pemex library, 2017

Figure 4: Gasoline shortages, January 2019
FoReSee: Natural resource curse case studies as part of the project.

Resource endowed economies tend to grow less rapidly than those without [Sachs and Warner, 1995]. Hypotheses:

- **Dutch disease (structuralist)**
- **Rent seeking behavior** [Lane and Tornell, 1996].
- **Corruption and institutional quality** [Sala i Martin and Subramanian, 2003].
- **Resource drag**
Main takeaways

1. Historically, excessive transfers from PEMEX to the government: 45% of sales or more than 80% of EBITDA in past 5 years. 1

2. As a consequence, the company has seen a balance sheet deterioration and its debt rise.

3. Decreased upstream investment has affected reserve replacement and production.

4. The cycle closes when decreased production affects PEMEX’ sales.
Mexico: Resource rich and large oil producer?

- **1P**: 8,484 Mmboe (9 years)
- **2P**: 16,160 Mmboe (16 years)
- **3P**: 25,467 Mmboe (25 years)

**Figure 4: Mexico’s reserves and resources. Source: CNH (2018)**

**Mexican hydrocarbon reserves**

(1P, million barrels of oil equivalent)

Sources: own elaboration with data from the SIE (System of Energy Information), IEA, and CNH.
Pemex: Tax regime and financial restrictions

- Historically **high tax burden: 50-65% of income**, limiting cash flow for investment.
- For several years, generated **positive pre-tax profits but after-tax losses**.
- Transfers from Pemex to government: **1990-2010 30% of government revenue; 21% in 2016**.

**Pemex performance and finances**
(nominal million pesos)

- Primary balance before taxes
- Primary balance after taxes
- Financial balance
Pemex: Labor costs and other operational inefficiencies

- Union’s pension debt: 50%
- 155,000 workers
- 2X Exxon
- 3X Petrobras
- 6X Statoil

Employees of Pemex (number of individuals)

Production per worker (daily barrels per occupied worker)

Source: own elaboration with data from the SIE

Source: CIDAC (2013)
Oil production and export value

Oil prod. has been declining since its peak in 2004; exports and export value follow.
Financial performance and macroeconomic risks
The 2013 energy reform

**Objective:** opening the O&G industry to competition and private investment.

**Open and competitive markets:**
- Exploration and production rights without private ownership of reserves
- Pemex joint ventures (farmouts)
- Conversion of existing E&P service contracts to production sharing agreements
- New upstream contracting model

**MID & DOWNSTREAM**
- Fuel price ‘liberalization’
- Fuel market liberalization: imports and retail

**New legal framework and Institutional arrangement**
- Constitutional changes
- 22 laws, 25 regulations
- 4 new institutions
  - ASEA
  - FMP
  - CENAGAS
  - CENACE
- 2 strengthened regulators
  - CNH
  - CRE
- State productive enterprises
- Contractors
Recent developments: Decisions of the new administration

- **Fighting corruption.**
- **Strengthening the role of state owned Pemex (and CFE).**
- **Reform has not delivered?** The decline in oil production as an argument of failure of 2013 energy reform (Vs. long lead time between investment and production).
- **Fuel (gasoline) self-sufficiency** (for several years Mexico has imported more than 60% of gasoline consumed).

**Decisions:**

1. **Upstream:** effectively halting 2013 energy reform
   - Halt bid rounds for 3 years
   - Existing contracts respected
   - Initiative to Reform Pemex Law (cancelled) (President’s Party Low Chamber)
   - Increase drilling and production (mainly in shallow waters).

2. **Mid/Downstream:**
   - Overaule existing refineries: reconfiguration of 6 existing refineries
   - Built a 7th refinery (340 barrels/day)
   - Fighting fuel teft
Prospects, challenges and opportunities

- How to ensure pro-poor economic growth?
- How to ensure revenue sustainability?
- Capital expenditure and stranded assets: What is the optimal investment now?
- Production and revenues: How to revert the production trend? How to use revenues sustainably?
Prospects, challenges and opportunities: 1. Revert the production trend

1. **Short/medium term:**
   - Long slide in output **reverted with upstream investment (exploration).**
   - Capital injection needed: **$640 billion dollars upstream** (IEA, 2016).
   - From the (already tight) fiscal budget or private investors?
   - **Without reform lower economic growth:** economic loss of 1 trillion USD without a new Energy Strategy, (IEA, 2016)

2. **Long term:**
   - Climate policy: **demand expected to decrease**
   - **Does the bet for oil makes sense?**
   - Revenue sustainability: make sure that the revenue in the next 10-20 years is re-invested?
Prospects, challenges and opportunities: 1. Revert the production trend

*IN SKY, PEAK COAL DEMAND IS ALREADY BEHIND US, PEAK OIL DEMAND FOLLOWS IN THE 2020s, AND AFTER A PLATEAU, GAS DEMAND FALLS RAPIDLY FROM 2040*

*Source: Shell analysis*
Prospects, challenges and opportunities: 2. Capital expenditures and stranded assets

- Oil demand peak late 2020
- Long lead time between investment and production: 10 years
- Assets will be stranded: globally over $2 trillion of new and existing investment is in danger of being stranded (Carbon Tracker Initiative).
- Government losses likely to affect welfare spending and funding of public institutions
- What is the optimal investment now?
- Coherence between climate policy and energy policy.
Prospects, challenges and opportunities: 2. Capital expenditures and stranded assets

Unneeded oil CAPEX to 2025 under 450 scenario

Source: Carbon Tracker and ETA
Prospects, challenges and opportunities: 3. How to ensure pro-poor growth?

- **Progressiveness of the fiscal policy (taxes + public expenditures):**
  - In isolation Mexican tax system is moderately progressive (before vs. after tax/expenditures)
  - When compared to a baseline where each citizen is entitled to a share of oil revenues, Mexico’s fiscal policy is regressive. (Segal, 2012)
  - Net effect: a transfer of oil entitlements from the bottom 90% to the richest 10% (Segal, 2012)
Prospects, challenges and opportunities: 3. How to ensure pro-poor growth?

- Mexican Petroleum Fund: changes to its design
- Direct and decoupled cash transfers low-income households
Prospects, challenges and opportunities: 4. How to ensure revenue sustainability?

- Hartwick rule: constant level of consumption can be sustained if value of investment equals value of rents at each point in time. (Hardwick, 1977)

- Oil revenues used to escape the curse: stabilization, savings, investments.

- Mexico 2000-2014: largest revenue share not directed at stabilization, savings and no conclusive evidence for investments. (Sanchez, 2016)

- While Stabilization Fund (established in 2000) used at crucial points, the largest part of 2000-2014 oil revenues not directed toward stabilization: Only 2.6%.

- Instead, close to half to current expenditures (ibid)

- New Oil Fund for Stabilization and Development flawed by institutional design?
Prospects, challenges and opportunities

- How to ensure pro-poor economic growth?
- How to ensure revenue sustainability?
- Capital expenditure and stranded assets: What is the optimal investment now?
- Production and revenues: How to revert the production trend? How to use revenues sustainably?
Thank you for your time!

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Mexico: Big oil producer?

- Mexico has had and still has significant reserves potential
- However, downward trend in reserves & production partly motivated 2013 Reform
- RP ratio of crude oil equivalent in 2018 for 1P reserves is 9 years and 25 for 3P (CNH, 2018)
- Pemex holds 95% of Mexico’s reserves & prospective resources

Resources and Reserves: Hydrocarbons in Mexico.

<table>
<thead>
<tr>
<th>Type</th>
<th>Oil (MMMb)</th>
<th>Gas (MMMcf)</th>
<th>Crude Oil eq. (MMboe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Resources</td>
<td>69.2</td>
<td>217.9</td>
<td>112.8</td>
</tr>
<tr>
<td>Conventional</td>
<td>37.3</td>
<td>76.4</td>
<td>52.6</td>
</tr>
<tr>
<td>Unconventional</td>
<td>31.9</td>
<td>141.5</td>
<td>60.2</td>
</tr>
<tr>
<td>Total Reserves</td>
<td>19,420</td>
<td>30,020</td>
<td>25,467</td>
</tr>
<tr>
<td>Proved</td>
<td>6,464</td>
<td>10,022</td>
<td>8,484</td>
</tr>
<tr>
<td>Probable</td>
<td>5,817</td>
<td>9,356</td>
<td>7,678</td>
</tr>
<tr>
<td>Possible</td>
<td>7,139</td>
<td>10,643</td>
<td>9,305</td>
</tr>
</tbody>
</table>

Source: National Hydrocarbons Commission (2018), Reserves Report 2018
## Fiscal regime of Pemex

<table>
<thead>
<tr>
<th>Before 2005</th>
<th>After 2005</th>
<th>After 2008</th>
<th>After 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Taxes based on income</td>
<td>• Improved because</td>
<td>• Simplified fiscal</td>
<td>• Simplified fiscal regime</td>
</tr>
<tr>
<td>Income tax (DEP)</td>
<td>more taxes based on</td>
<td>regime</td>
<td>regime</td>
</tr>
<tr>
<td>Special tax on extraction (DEEP)</td>
<td>net earnings</td>
<td>mainly based on net</td>
<td>increased cap for</td>
</tr>
<tr>
<td>Right on oil extraction (DAEP)</td>
<td>than gross sales</td>
<td>income</td>
<td>capital cost</td>
</tr>
<tr>
<td>• Tax on oil returns (ISRP)</td>
<td></td>
<td>• States get a share of oil revenues</td>
<td>deductions</td>
</tr>
<tr>
<td>• Sales tax (IEPS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Hydrocarbon right (DSH)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration with data from Carreon-Rodriguez & Rosellon (2012) and Moody’s (2017)
Capital spending and legacy of under investment

Financial restrictions of PEMEX negatively affected investment in exploration, development and technology, ultimately affecting reserve placement and production. (Carren-Rodriguez & Rosellon, 2012)

- PEMEX annual budget (and financing program) part of Mexico’s government budget
- Budget approval needed from SHCP and Congress
- Project approval before 2008 after 2008 reform
- Reform of 2008: permitted performance based service contracts (contractors paid for services and do not get rights to sell or buy oil produced).
- Before reform, PEMEX could not issue equity capital nor borrow money by selling bonds
Pemex and Petrobras: A comparison

<table>
<thead>
<tr>
<th></th>
<th>Brazil (Petrobras)</th>
<th>Mexico (Pemex)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government take/incomes</strong></td>
<td>Government take represents between 25% and 50% of revenues, albeit with a clear declining trend in recent years.</td>
<td>Government take is the majority share of the incomes, between 50% and 65%. Stable trend throughout the period but with uncertainty due to deterioration in the performance of the company from 2014.</td>
</tr>
<tr>
<td><strong>Total investment/incomes</strong></td>
<td>Investment represents a high percentage of revenue, consistently over 50% with peaks of 80%. This trend continues throughout the period, although with variations.</td>
<td>Investment represents a very low percentage of revenue, remaining under 20% during the period, albeit with a slight increase in recent years.</td>
</tr>
<tr>
<td><strong>Evolution of proven reserves (2002–2014)</strong></td>
<td>193% increase in proven reserves of gas 165% increase in proven reserves of oil</td>
<td>41% drop in the proven reserves of oil and gas</td>
</tr>
</tbody>
</table>

Source: Ramírez-Cendero & Paz (2017)
The 2013 energy reform and Pemex

- Pemex becomes a 'State Productive Enterprise'
- Investment: The congress determines and approves budget for Pemex, but Pemex has autonomy to distribute and invest in projects
- Tax burden: Lower tax rate for PEMEX, but government can continue drawing on the state oil company’s profits for national purposes despite PEMEX official status as autonomous firm
  - Constraining PEMEX long term investment plans
- Pemex CEO says it must move to IPO (like Saudia Arabia’s Aramco), but it will take years: Protect Pemex against politicians bad decisions by having a new equity investor.
Reform implementation upstream

16% of 2P reserves and 78% of resources available for bidding.

Source: own elaboration with data from the CRE, CNH and the Ministry of Energy
Pemex: Production

Oil production after the 2013 Reform
(tbd)

- Total
- Entitlements (Pemex)
- Contracts (Private)

The Mexican Petroleum Fund (FMP)

The fund receives, and manages (transfers & invests) all non-tax revenue from new contracts and assignments. It transfers payments to contractors (under profit sharing contracts).

- **Functions:**
  - Administer the state income from oil rents
  - Constitute and administer a Reserve for long term savings
  - Administer financial and calculation aspects of contraprestaciones/compensations

- **Institutional arrangement:**
  - Trustee: Central Bank, highly trusted institution
  - Trustor: Ministry of Finance
  - Committee: three State representatives & four independent (nominated by Executive, approved by 2/3 Congress)
The Mexican Petroleum Fund (FMP): Flawed by institutional design?

- Input (income) to the FMP:
The Mexican Petroleum Fund (FMP): Flawed by institutional design?

However, the Reserve of the Fund may be limited according to the Law of the FMP: Not following the Hartwick rule

- Output (transfers & savings) of the FMP (Articles 8 and 16 LFMP):

![Diagram showing the flow of funds from the Mexican Petroleum Fund (FMP) to various funds and the conditions for transfers based on GDP levels.]
The Mexican Petroleum Fund (FMP): Flawed by institutional design?

In 2017, the Long Term Savings Reserve received resources for the first time, after three years of operation.

<table>
<thead>
<tr>
<th>FMP Transfers to Funds, Treasury and Long-term Savings</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>(million pesos)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total transfers to Treasury and Funds</td>
<td>398,805</td>
<td>307,920</td>
<td>442,875</td>
</tr>
<tr>
<td>Percentage of GDP</td>
<td>0.0%</td>
<td>1.6%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Oil Revenue Excedent (Bruto)</td>
<td>0</td>
<td>0</td>
<td>55,972</td>
</tr>
<tr>
<td>Oil Revenue Excedent (Neto)</td>
<td>0</td>
<td>0</td>
<td>17,906</td>
</tr>
<tr>
<td>Percentage of GDP</td>
<td>0.09%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>