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

Preliminary results, FoReSee case study

DIW Berlin

March 27, 2019

Overview

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.

FoReSee

Fossil Resource Markets and Climate Policy:
Stranded Assets, Expectations and the Political Economy of Climate Change.

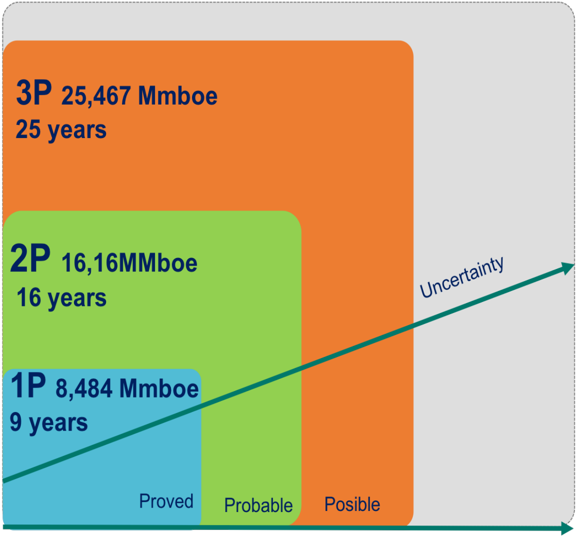
Resource endowed economies tend to grow less rapidly than those without [Sachs and Warner, 1995]. Hypotheses:

- **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?



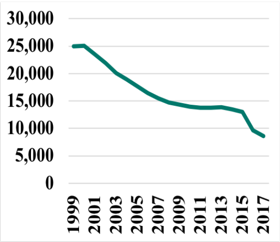
Reserves **Resources, 112 MMboe**

18th Proved oil reserves

12th Oil producer

Mexican hydrocarbon reserves

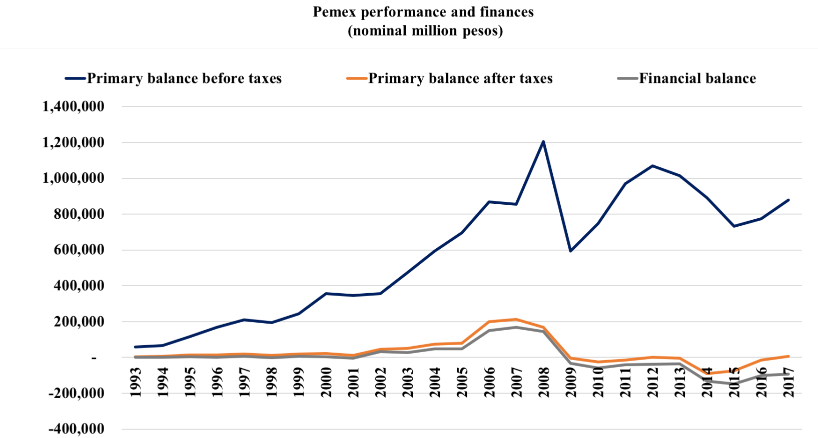
(1P, million barrels of oil equivalent)



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: Labor costs and other operational inefficiencies

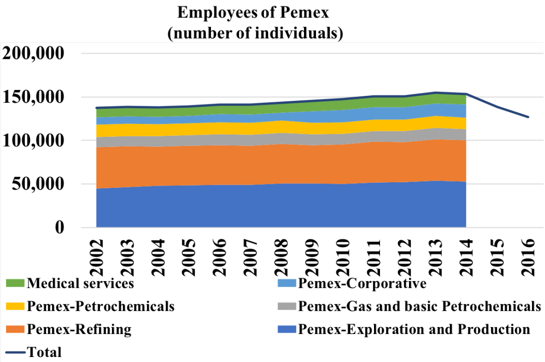
Union's pension 50% debt

155,000 workers

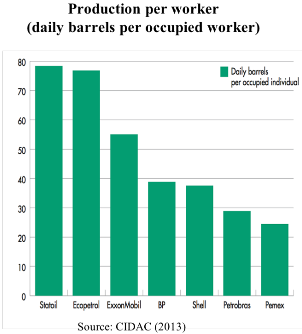
2X Exxon

3X Pretrobras

6X Statoil



Source: own elaboration with data from the SIE

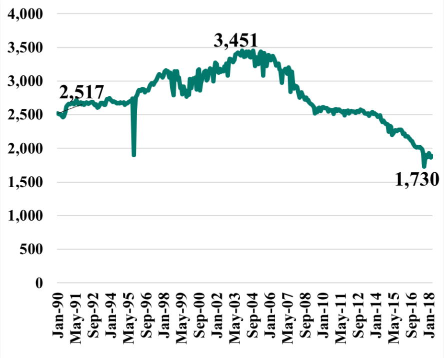


Source: CIDAC (2013)

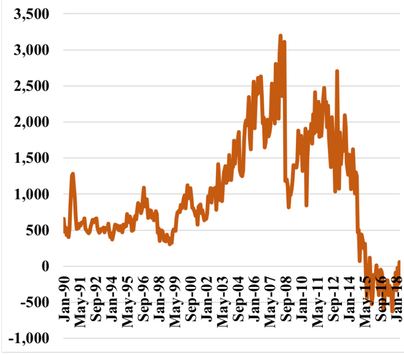
Oil production and export value

Oil prod. has been declining since its peak in 2004; exports and export value follow.

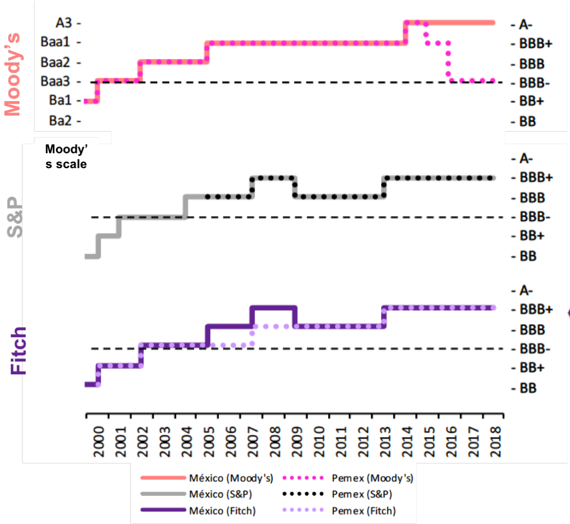
Crude oil production
(tbd)



Net export value
(Crude oil and oil products, million dollars)



Financial performance and macroeconomic risks



Source: Banxico (2018)

Jan 2019: Pemex downgraded from BBB+ to BBB-

The 2013 energy reform

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

UPSTREAM

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

Open and competitive markets:

- 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
   - Exsting contracts respected
   - Initiative to Reform Pemex Law (cancelled) (President's Party Low Chamber)
   - Increase drilling and production (mainly in shallow waters).

2. **Mid/Downstream**:
   - Overaul 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?

Capital expenditure and stranded assets: What is the optimal investment now?

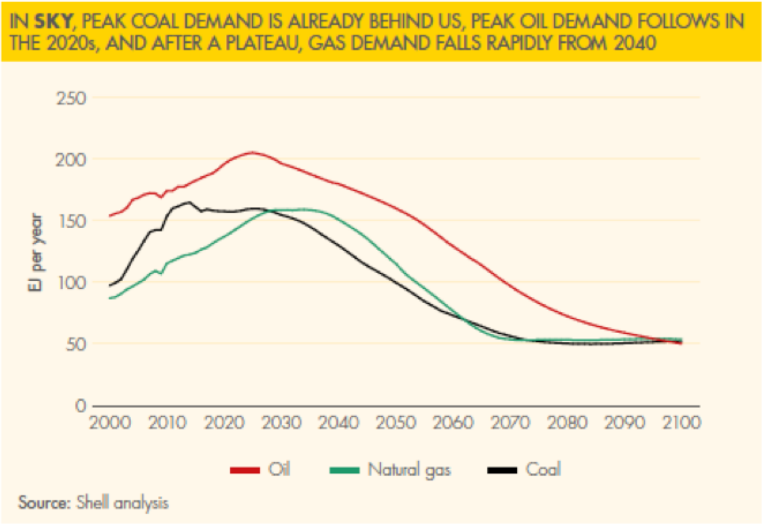
How to ensure revenue sustainability?

**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

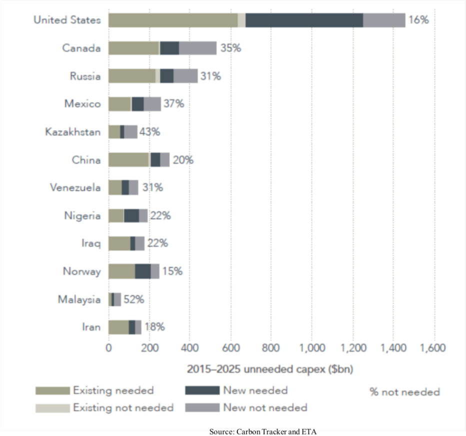


Prospects, challenges and opportunities: 2. Capital expenditures and stranded assets

- 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

Uneeded 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?

Capital expenditure and stranded assets: What is the optimal investment now?

How to ensure revenue sustainability?

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.

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

Source: National Hydrocarbons Commission (2018), Reserves Report 2018

Fiscal regime of Pemex

Fiscal regime of Pemex.

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

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 more
- 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

	Brazil (Petrobras)	**Mexico (Pemex)**
Government take/in- comes	Government take represents between 25% and 50% of revenues, albeit with a clear declining trend in recent years.	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.
Total investment/in- comes	Investment represents a high percentage of revenue, consistently over 50% with peaks of 80%. This trend continues throughout the period, although with variations.	Investment represents a very low percentage of revenue, remaining under 20% during the period, albeit with a slight increase in recent years.
Evolution of proven reserves (2002–2014)	193% increase in proven reserves of gas 165% increase in proven reserves of oil	41% drop in the proven reserves of oil and gas

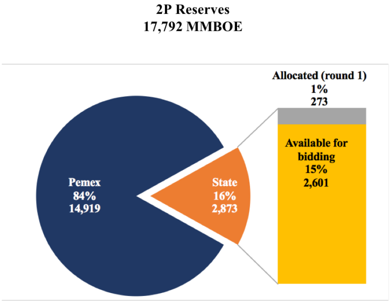
Source: Ramírez-Cendrero & Paz (2017)

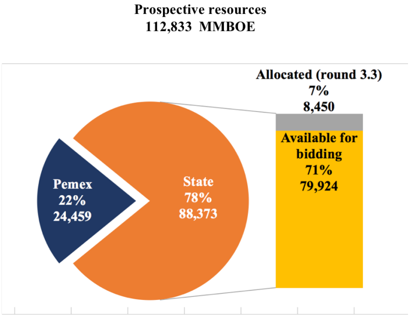
The 2013 energy reform and Pemex

- Pemex becomes a 'State Productive Enterprise' more
- 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 more , 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

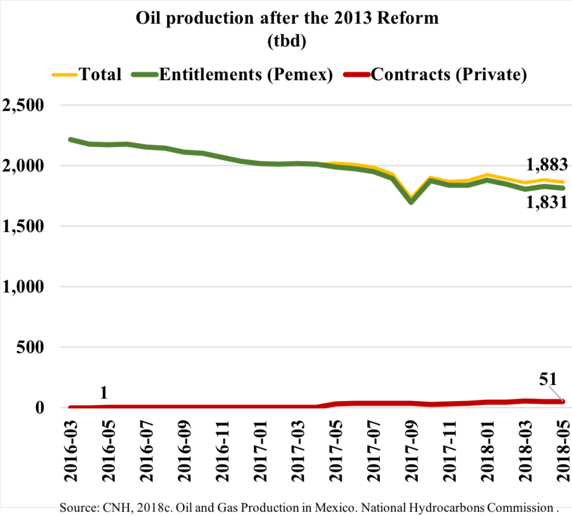
16% of 2P reserves and 78% of resources available for bidding.





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

Pemex: Production



Source: CNH, 2018c. Oil and Gas Production in Mexico. National Hydrocarbons Commission .

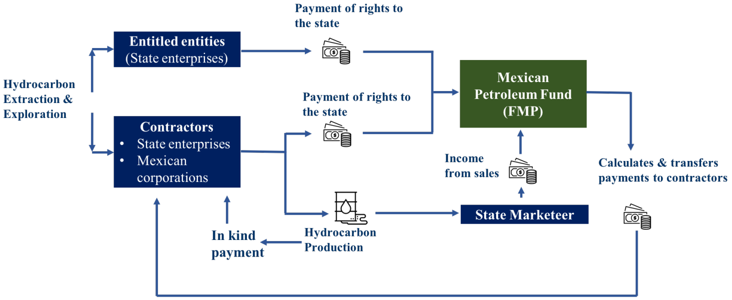
The Mexican Petroleum Fund (FMP)

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:

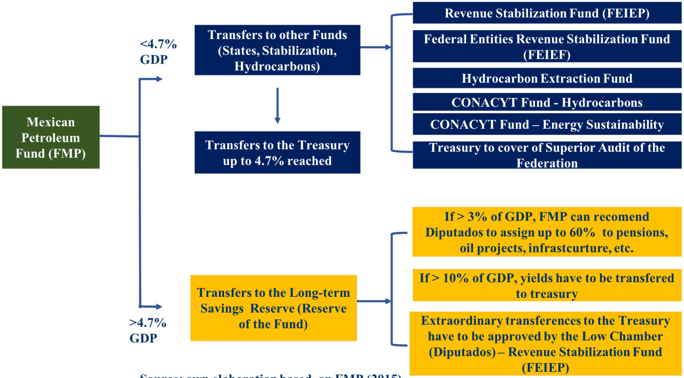


Source: based on FMP (2015)

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):



Source: own elaboration based on FMP (2015)

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

FMP Transfers to Funds, Treasury and Long-term Savings
(million pesos)

	2015	2016	2017
Total transfers to Treasury and Funds	398,805	307,920	442,875
Percentage of GDP	0.0%	1.6%	2.2%
Oil Revenue Excedent (Bruto)	0	0	55,972
Oil Revenue Excedent (Neto)	0	0	17,906
Percentage of GDP			0.09%

Source: own elaboration with data from FMP (2015-2017)