PETROLEUM LEASING AND FISCALISATION, AND THEIR IMPACT ON INDUSTRY STRUCTURE, COMPETITION, PRODUCTION AND GOVERNMENT REVENUES IN THE US GULF OF MEXICO

US GOM: A PREMIER HYDROCARBONS PROVINCE ON A GLOBAL SCALE

Current role in US petroleum supply/industry

- 25 % of oil production (deep water: 15%); 23 % of natural gas production; 15 % of total proved reserves
- Second most important source of revenue for US government; offshore activities mean USD 6 billion per year to Louisiana's economy alone

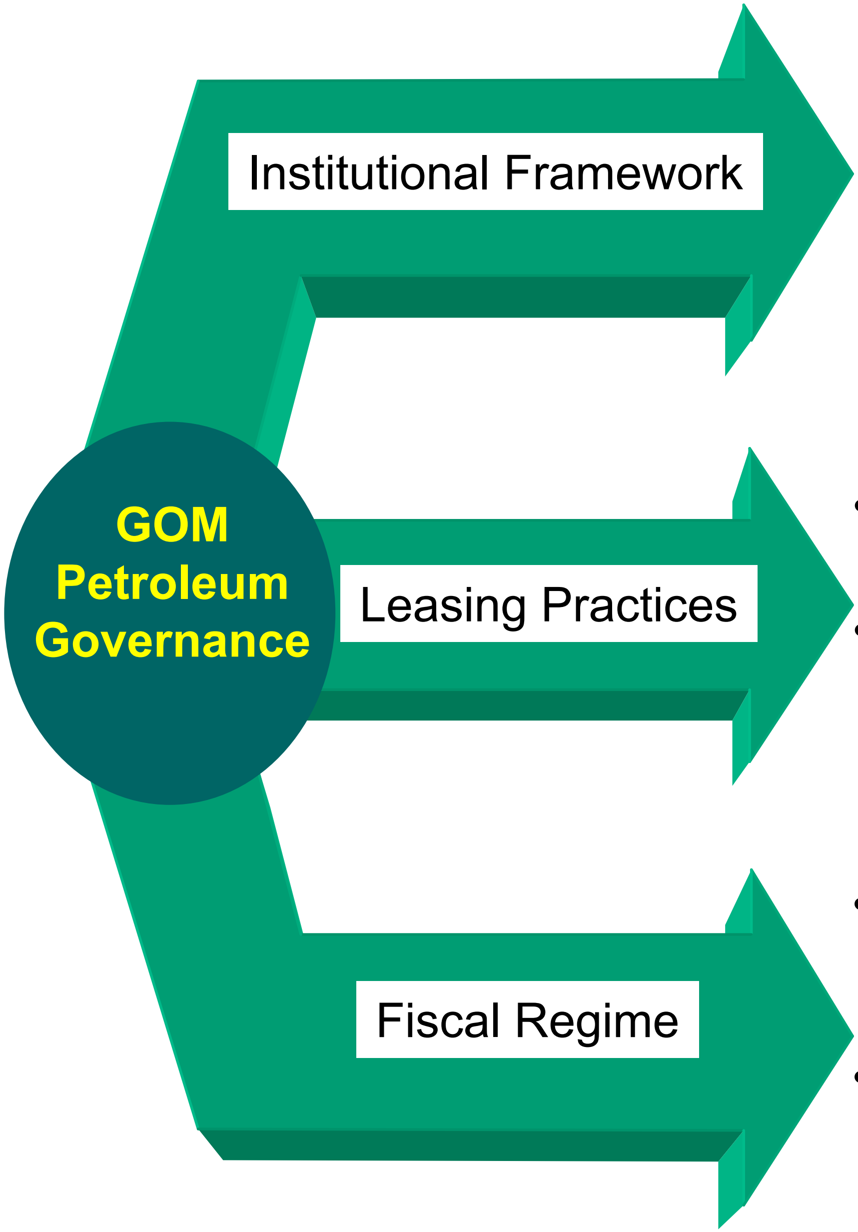
Future role in US petroleum supply

- Deep water crude production as much as 1.8 MMBD by 2006.
- Annual deep water gas production expected to grow from 0.8 tcf (1998) to 4.5 tcf (2010); to satisfy 50 per cent of incremental US gas demand over 2000-2010

"Demonstration effect"

- Most intensively explored and developed offshore province: 35,000 wells (UK + NOR + DK = 8,000+)
- Hottest exploration play worldwide 1993–2003: 8.7 billion BOE added in P + U reserves + discoveries
- Remarkable resurgence in output, attributed to changes in institutional framework (2000 production is 650 MBOED greater than 1993)

PETROLEUM GOVERNANCE IN GOM IS HIGHLY IDIOSYNCRATIC



Institutional Framework

- Based on unique conception of subsoil tenure: ownership of minerals vested in possessor of the surface
- Legally structured around lease contracts governed by private law
- Out of synchrony with federalist character of US political system

Leasing Practices

- Frequent lease offerings, assignation of blocks through competitive cash bidding
- Limited primary term for leases (5 years, 10 in deep water); unlimited lease tenure so long as oil and gas found in paying quantities

Fiscal Regime

- Reliant on signature bonuses rather than resource rent taxes as key vehicle for capturing excess profits
- Has generated USD 129 billion to 2000; 54% royalties,46% signature bonuses (but 67% up to 1982 inclusive)

THE POLITICAL CONTEXT OF OIL AND GAS ACTIVITIES IN GOM IS NOTABLE FOR ITS ANTI-FEDERALIST CHARACTER

- The USA is the country with the strongest federal tradition of all
- The Federal government is ***generally*** obliged to distribute share of royalty and bonus receipts "to help state and local governments meet their costs of supporting development activities on public lands"

Onshore federal leases stipulate 50 per cent revenue-sharing for royalties (sole exception Alaska, which gets 90 per cent)

AND YET…

- OCS oil leasing ***ONLY*** Federal programme for "leasing, sale or disposal of public resources" where ***NO*** provision made for revenue sharing
- Coastal states receive money from OCS oil/gas only through congressional CZMA/OCSLA appropriations
- Coastal states face many risks associated to OCS oil activities and pay large bills for onshore support services and infrastructure, but cannot tax OCS facilities

HOW DO CASH BONUSES WORK AS RENT COLLECTION DEVICES?

ADVANTAGES

- **Investment neutrality** → Bonus: NPV of excess profits, net of tax (projects are the same pre- and post-tax)
- **Transparency and unambiguousness** → Arm's-length (objective) assignation, not open to litigation
- **Administrative simplicity, low cost** → No ring fencing, no definition problems: "ledger and bank" exercise
- **Sunk cost character** → No perverse expenditure incentives (goldplating); may allow high fiscal takes

DISADVANTAGES

- **Minimum knowledge threshold** → Requires ballpark figure calculation of excess profits
- **Control and audit sophistication** → Evaluation of informational content of bids (collusive signalling)
- **Cost frontloading** → Deterrent effect on potential entrants
- **Meant to capture expected rents** → Rents may not materialise, affecting flow of investment

ROLE OF CASH BONUSES IN GOM MEANS AUCTION DESIGN IS CRUCIAL

The Problem

- Acreage auctions take place under acute adverse selection conditions
- Asymmetric information forces lessors to give up rents to advantaged players

The Solution

- Competition between lessees loosens informational constraints, increasing capability of auctioneer to extract Ricardian rents from lessees

Golden rules of auction design

1. Make sure that bidders who bid high face low risks of not getting what they want, and vice versa
2. Design safeguards vs. collusion
3. Commit to credible reserve prices
4. Do not ignore the structure of the industry that results from the auction, lest competitive distortions that may affect future auctions develop
5. Address the asymmetrical and self-reinforcing effect that the winner's curse can have on certain type of bidder

☞ DOI translated these rules into policies in very different ways BEFORE and AFTER 1983

UP TO 1982, OCS LEASING BASED ON A *DEMAND–LED* PROCEDURAL MECHANISM

Tract nomination

Tract selection criteria

- Industry expressed interest in *SPECIFIC* blocks (5 sales per year)
- DOI selected tracts,but under no obligation to offer nominated tracts (if information lacking, for instance)
- DOI estimated value of blocks; estimates quite conservative (seen as *too* conservative even)

Assignation criteria

- Primary: value estimate
- Secondary: magnitude of highest bid
- No obligation to assign acreage if bids too low (rejected high bids 13 times smaller than realised values)
- No small firm bias (majors bought 80 per cent of leases but more prone to acquire dry leases)

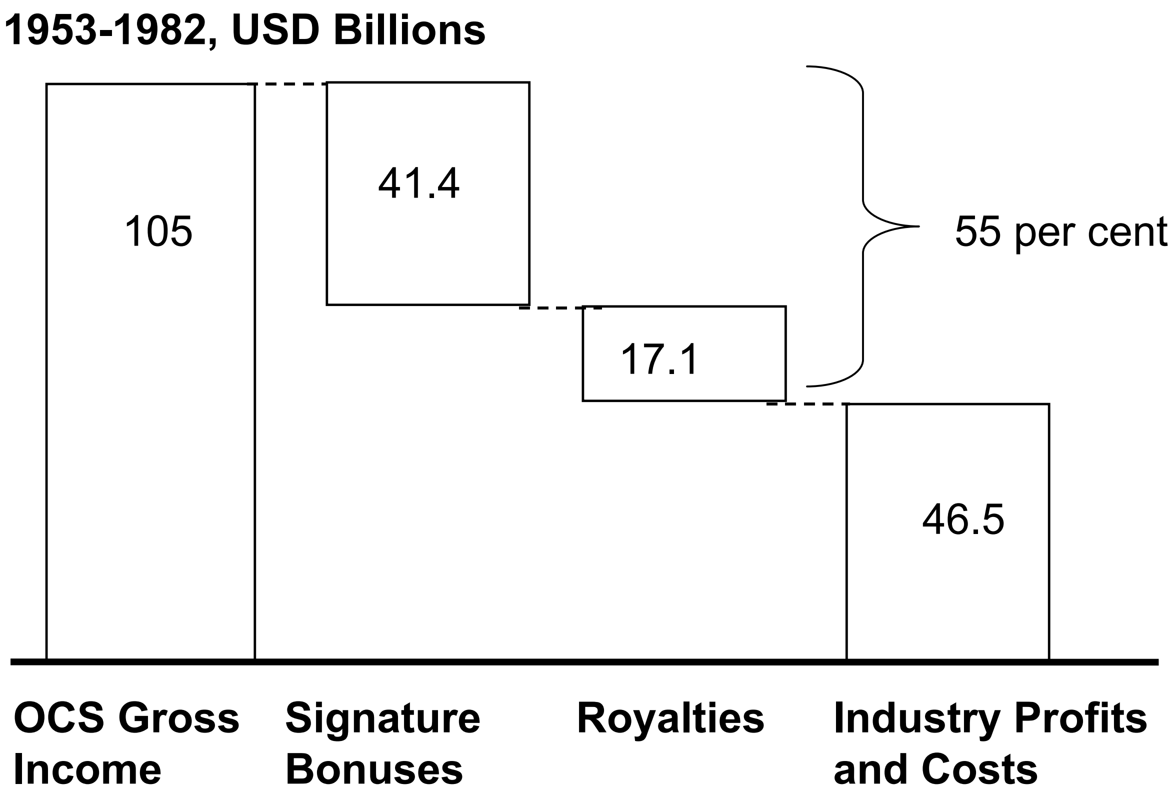
Levelling criteria

- Persuaded large players to reveal privileged information
- Selection process endowed with crucial signalling attributes
- Allowed small players to concentrate scarce evaluation resources, lowering exploration risks (one additional bid was worth 6.2 MMUSD per tract)

Outcomes

- Kept demand for blocks high
- Kept collusion at bay
- Enhanced competition

TN SYSTEM PROVED HIGHLY SUCCESSFUL, ESPECIALLY IN FISCAL TERMS



- Oil output from zero to peak of 1.1 MMBD; gas to 13.2 BCFD
- Over 1972-81, fiscal take at unsustainable levels (78 per cent), on account of exuberant cash bonus payments (peak = 6.7 billion,1981)
- Upfront payments seen as compromising further output expansion

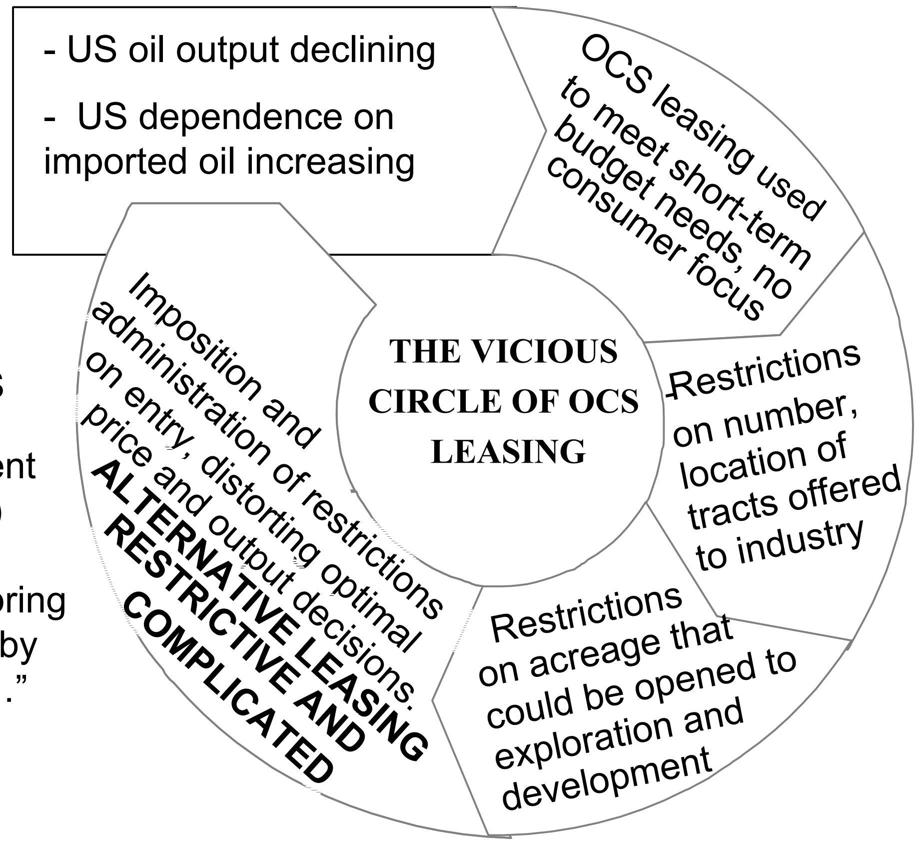
- In 1978, OCSLA amended to reduce the upfront leasing amounts, in a way that would "require the holder of the lease to pay the government a larger share of any follow-on production".
- DOI to use alternative leasing systems for at least 20 per cent (up to 60 per cent) of tracts offered between 1980-83. 215 GOM tracts leased with profit sharing, but use abandoned due to complexity (and changing political circumstances)

Source: Minerals Management Service

THE REAGAN ADMINISTRATION SAW THE TN SYSTEM AS A MAJOR CAUSE BEHIND THE 1970s ENERGY CRISIS

The Wake Up Call (1973–81)

- Oil price rises threatening US economy
- OPEC waging “moral equivalent of war” (gas lines, brownouts)
- Kissinger doctrine: “a political, indeed moral, conviction…to bring about a reduction in oil prices by breaking the power of OPEC…”



The credo: “if you are interested in consumers, you want to deliver energy to them. If you are interested in national security, you want energy, and *energy comes through competition, not through restricting supply”* (J.W. Watt, Secretary of Interior, 1981–3)

The diagnose*:* TN shackled the oil industry (indirectly making American prosperity a hostage to OPEC); thus, a radical overhaul of the offshore leasing programme necessary, *to restore competitive discipline* to this vital sector

FROM 1983 ON, OCS LEASING BASED ON A *SUPPLY–LED* PROCEDURAL MECHANISM

Areawide leasing

Tract selection criteria

- Entire planning areas offered (up to 50 MM acres)
- Tracts no longer evaluated individually
- At least 8 sales per year (*entire* OCS in first five years)
- Longer primary lease terms (8-10 years for deepwater acreage)

Assignation criteria

- Estimates prepared for tracts with less than 3 bids; high bid accepted if better than geometric average of estimate and all bids received
- High bid *automatically* accepted: 3 or more bids or if tract deemed unviable (lack of map reason enough to classify as unviable)
- Minimum bid increased (25 to 150 per acre)*

*until 1986 only; current: USD 25 in shallow water, USD 37.50 in deep

Levelling criteria

- **Reduce upfront stakes**
- **Winners' curse, info. asymmetries ASSUMED AWAY**(*MMS def. of fair market value:* **"**amount for which in all probability the property would be sold by knowledgeable owner willing but not obligated to sell to knowledgeable willing buyer not obligated to buy. This value is not hypothetical; insofar as it is possible to estimate it, it represents ***the actual selling price"***)

Objectives

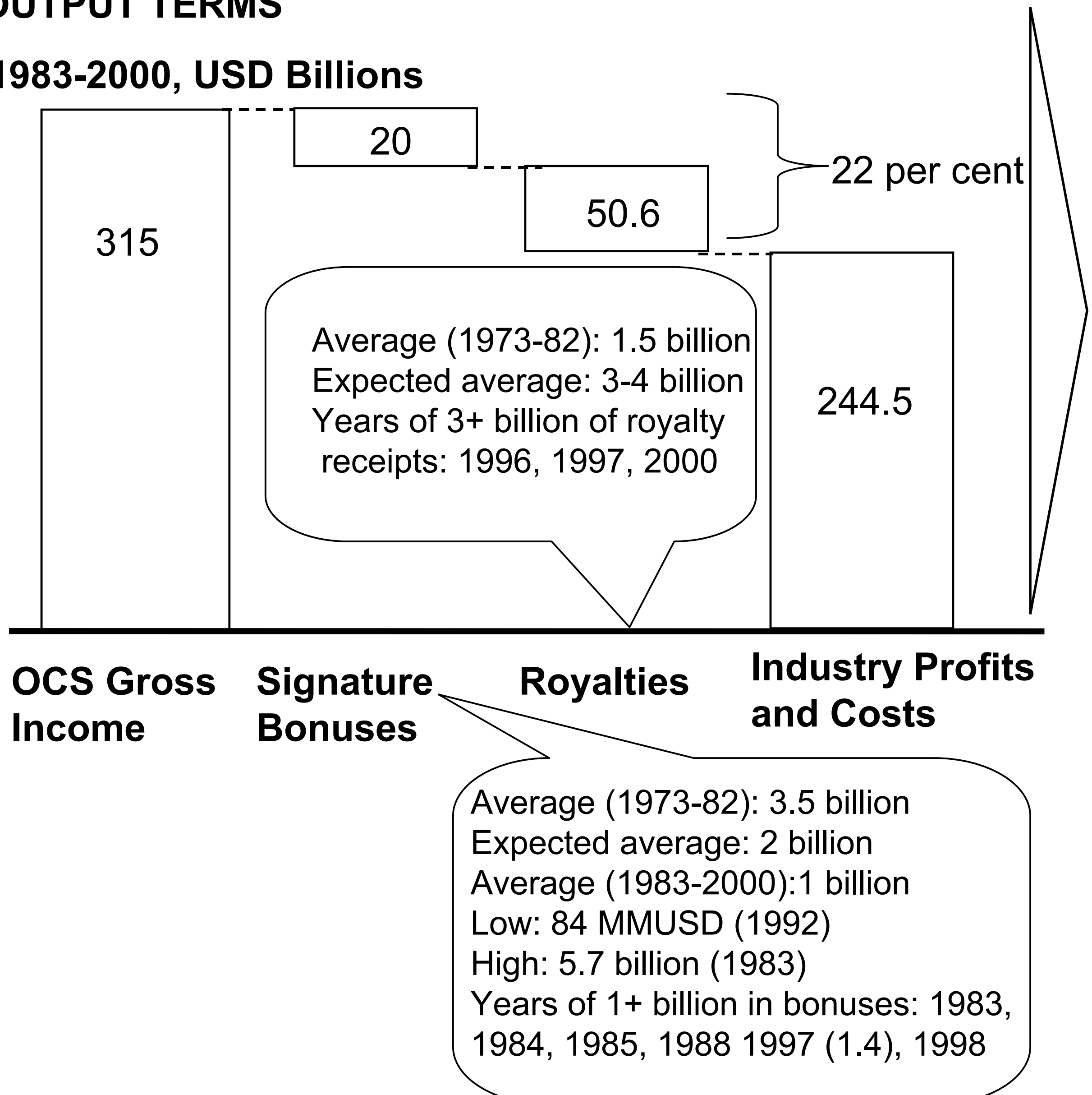
More options for companies

Quick access to resources

Lower entry barriers

AWL SYSTEM PROVED COSTLY IN FISCAL TERMS, AND FAILED TO DELIVER IN OUTPUT TERMS

1983-2000, USD Billions



Source: Minerals Management Service

- AWL greatly increased the acreage offered and leased, despite vast OCS areas being put out of bounds by moratoria

	Acres (millions)	
Period	Offered	Leased
1953-82	58	23
1983-00	1,317	83

- Acreage prices declined accordingly

Period	US Dollars per acre
1953-82	1,275
1973-82	2,253
1983-00	216
1993-00	131

- Output response did not follow: royalty estimates imply 50-60% increase in output to **1.8-2 billion BOE** (with prices falling 25%) Real figure: **1.2 billion** for 1983-2000; **1.4 billion** 1993-2000.

THE KEY ECONOMIC REASONING BEHIND THE AWL DEREGULATION MODEL IS TOO SIMPLISTIC

- In the Reaganaut view of the world, cartelisation through regulation is the inevitable outcome of ***any*** governmental interference with the market mechanism

THE PROBLEM: Regulatory entities cannot resist the imposition and administration of restrictions on entry, thereby distorting what might otherwise have been independent and competitive price and output decisions

THE CONSEQUENCE: The power to license becomes the power to exclude, used chiefly to benefit those incumbents which licensors are supposed to oversee most closely

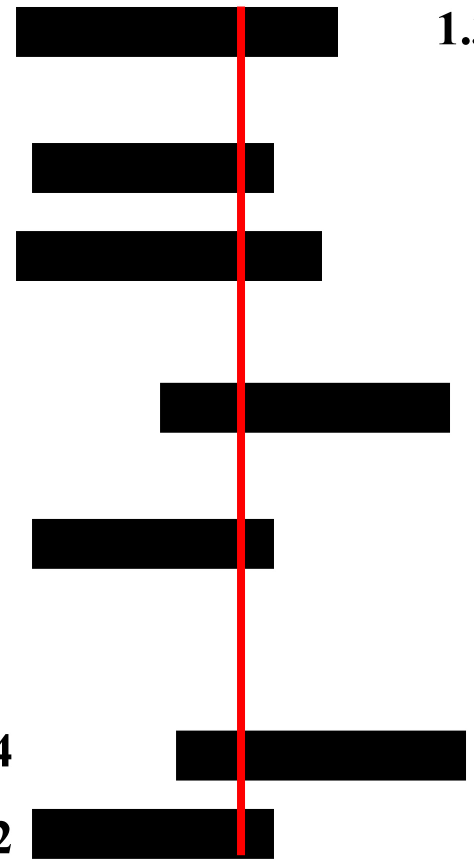
- However, most regulatory economists ***DO NOT*** subscribe to this Manichean view

J.J. LAFFONT ***J. TIROLE***

"the question of whether agencies favour or discourage entry ... ***cannot be resolved on purely theoretical grounds*** [because] only a ***detailed industry study*** can indicate the relevance of [the factors that determine] ... whether cartelisation or excessive entry occurs ... [namely] the pro- or anti-competition nature of the agency's information ... whether the political principal is active or passive and whether competition destroys industry rents"

SOURCE: *A Theory of Incentives in Procurement and Regulation*. Cambridge (Mass.), The MIT Press.

FIGURE F11.1: INDICATORS OF THE INTENSITY OF COMPETITION IN THE MARKET FOR LEASES IN THE GOM FEDERAL OCS



	1953-1982	1983-2004
Average bids per leased tract	**3.14**	**1.38**
Acreage leased as a percentage of acreage offered	**40**	**6**
Rejected bids as a percentage of high bids	**17**	**5**
Winning bids as percentage of total monies exposed	**44**	**74**
Signature bonuses as percentage of gross income	**90**	**5.8**
Percentage of winning bids:		
<100 USD/acre	**14**	**63**
> 800 USD/acre	**52**	**3**

Source: MMS

DURING THE 1980S, GOM EXPLORATION MOVED TOWARDS FRONTIER AREA; CW SEES THIS BEHIND BOTH LOWER BONUSES AND DOMINANCE BY MAJORS

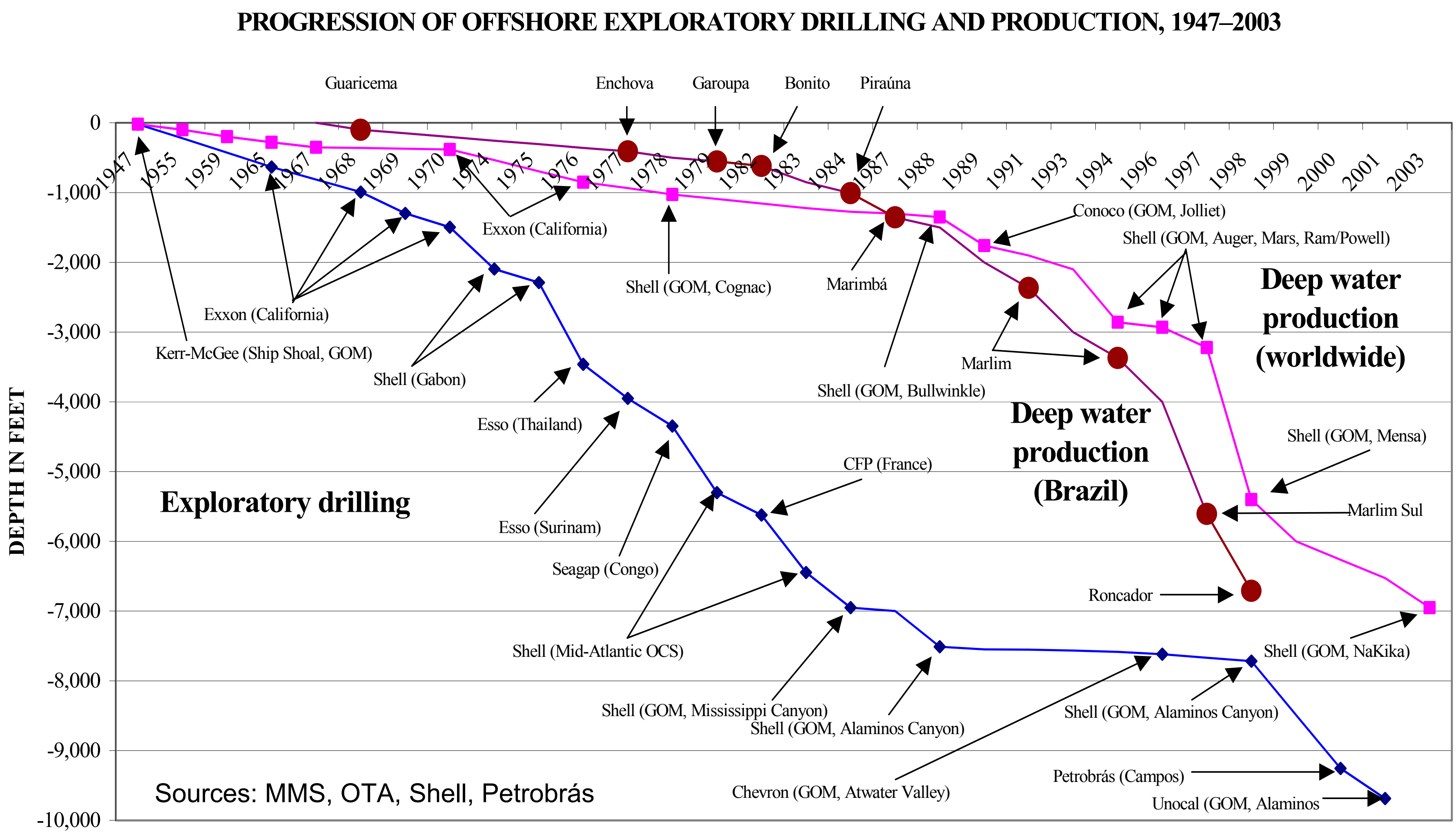
- Deep water tracts account for 40% of acreage leased under AWL (2.8%, 1974-82)
- Leases assigned during 1983-85 account for 75 per cent of cumulative deepwater output
- Deepwater production is now the norm rather than the exception in GOM (production weighted average depth is now 1,500 feet)

- Frontier projects involve greater than usual technical cost, risks and managerial talent, so bonuses discounted accordingly
- Commonly assumed that only majors are able to marshal the enormous financial, and human resources necessary to tackle such projects

HOWEVER…

- This point of view overstates the degree of technological and project-management superiority that majors are supposed to enjoy (cf. Ekofisk, Campos, tar sands, Arctic oil)
- What MMS really achieved by leasing deepwater acreage through AWL was to forego the chance to collect massive excess profits when these in fact materialised, and to allow players who could carry the costs of very long-term speculative investments to establish a corner on the most prospective deepwater acreage, pre-empting players who could not develop deepwater technology in house.

EVOLUTION OF DEEP WATER E&P SHOWS THAT DEVELOPMENT IN GOM WOULD HAVE OCURRED WITHOUT AWL, WITH NON-MAJORS PLAYING PROMINENT ROLE



GOM deepwater development resumed when the oil industry acquired capability of working working in 2000+ ft. in other provinces (in 76 per cent of productive deepwater leases, first oil came after more than 8 years from assignation)

COMPARISONS AT THE LEVEL OF INDIVIDUAL PROJECTS SHOW THE DIFFERENCE THAT *LAISSEZ FAIRE* MADE TO DEEPWATER LEASING

1975 Dollars

Cognac		*Mars*
1975	*Discovery date*	1989
1975	*Project start-up*	1993
1,000 (WR)	*Water depth (feet)*	2,940 (WR)
200	*Reserves (MMBOE)*	500
464	*Dev. Cost (USD million)*	490
783	*Total Costs (USD million)*	492
2.43	*Dev. Cost (USD/BOE)*	1.07
3.91	*Total Cost (USD/BOE)*	1.07
71	*Peak production (MBOED)*	175
62	*Number of wells*	24
2.5	*Cost per well (USD million)*	11.6
>2	*Production per well (MBOED)*	9
295	*Leasing costs (USD million)*	2.2
1.48	*Leasing costs (USD/BOE)*	0.004
13,020	*Leasing costs per acre (USD)*	64.6
Shell	*Operator*	Shell
Conoco, Unocal, Florida Gas, Drillamex, Ocean Oil, Murphy, Amoco, Getty, Sonat, Barber Oil, The Offshore Co., Koch, General American Ocean Production	*Partners*	BP

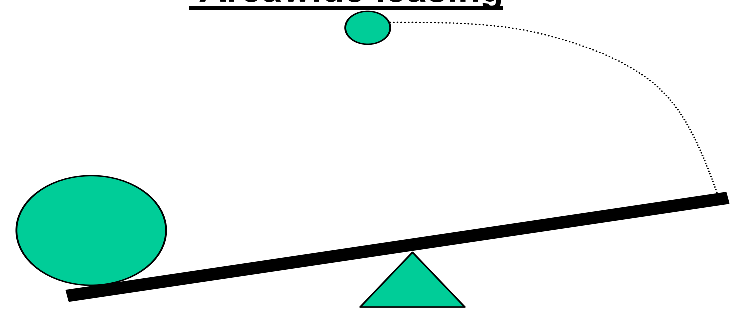
Source: Minerals Management Service

AWL EXACERBATED THE INFORMATIONAL ASYMMETRIES IN THE MARKET FOR OFFSHORE LEASES, RELEGATING INDEPENDENTS TO A LOW PROFILE ROLE

- Paradoxically, in seeking to reduce a certain type of entry barrier through the easing of restrictions on access to offshore acreage, AWL raised entry barriers overall, for the benefit of large companies

Tract Nomination

Areawide leasing



1953-82	VITAL STATISTICS OF INDEPENDENT OIL COMPANIES	1983-2000
45	*Share of GOM output (%)*	52
61	*Share of GOM bonus payments (%)*	63
39	*Share of GOM deepwater output (%)*	12
39	*Share of deepwater bonuses(%)*	30

- **Independents' competitive position improves when informational asymmetry decreases.**

- After first subsalt discovery (1992), block SS 337 (updip from SS349) received 9 bids, leased for 40 MMUSD (7000 USD/acre), highest AWL figure.
- In Lease Sale 181 (December 2001), only 1.3 MM acres offered (lowest AWL), bonuses 340 MMUSD (USD 622 per acre; third highest AWL). In Lease Sale 180 (August 2001), acres offered 22.3 million, bonuses 163 MMUSD (USD 93 per acre).

WHAT LESSONS HAS THE INDUSTRY DRAWN FROM AREAWIDE LEASING?

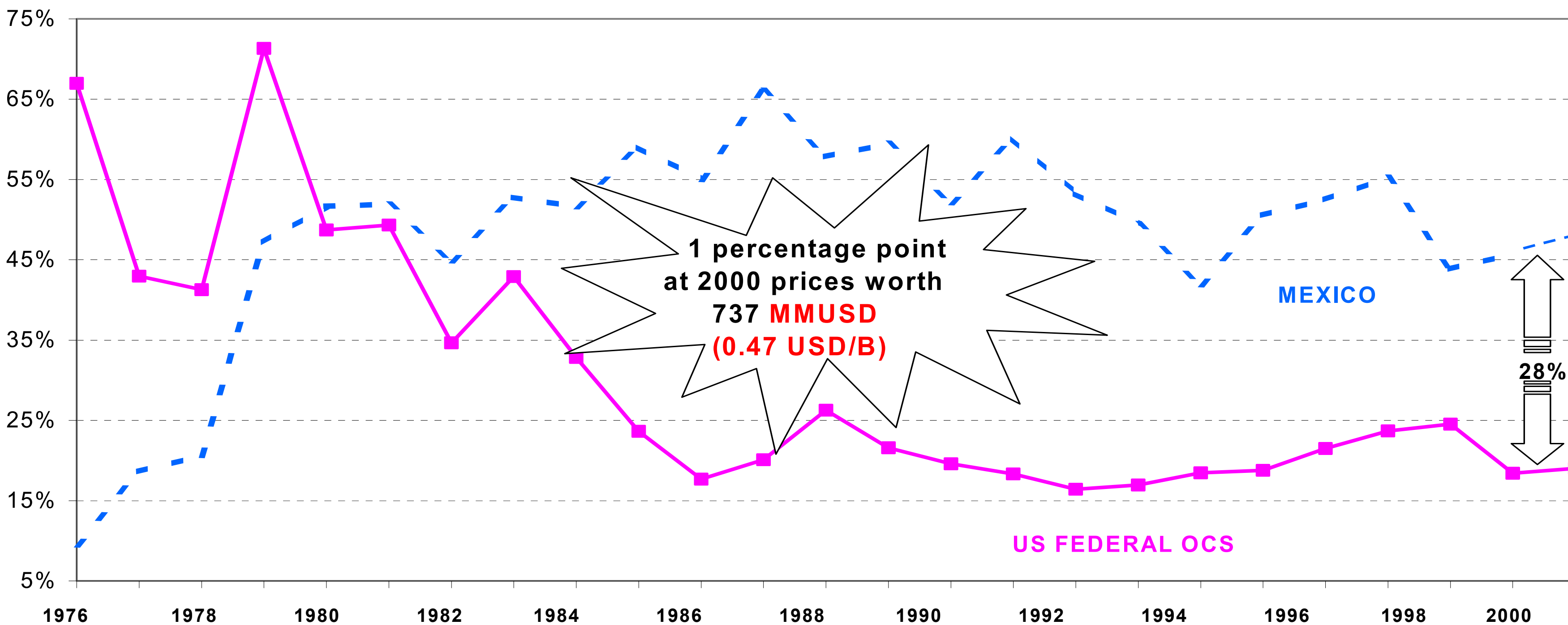
- "The marketplace is the right place for decisions to be made regarding the allocation of natural resources" (James W. Watt, 1983)
- "The amount of money paid for an offshore lease depends on the level of interest that it manages to arouse in competing bidders, a factor more directly related to an area's resource potential than to the method of leasing" (Office of Technology Assessment, US Congress, 1985).
- "Each leased tract from 1953 to 1981 drew an average of 3.3 bids, and this empirical evidence indicates that competition is effective in the OCS auction markets under conventional leasing conditions" (Walter J. Mead, 1994).
- "New leases should be awarded in perpetuity, effectively privatising the OCS oil resource, on the basis of a high pure bonus bid, capitalising royalty streams for a buyout". (Walter J. Mead and Robert L. Bradley, 1998).
- "In 1997, Alaska changed the lease sale methodology. Formerly, the state offered areas for sale based on nominations by industry. Now all lease sales are areawide sales, in which all available acreage within a geographic region is included" (Alaska Department of Natural Resources, 2000)
- "The GOM licensing regime was radically changed in 1982, resulting in a system which became much more attractive than the previous *out–dated* system" (Arthur Andersen Petroleum Services, 2001)

WHAT LESSONS *SHOULD* WE DRAW FROM AWL? THE FISCAL DIMENSION

- Fiscally, true *laissez faire* leasing/licensing regimes are grievous (in GOM and UK North Sea, fiscal participation as a percentage of gross income is 19% and 16%, respectively)
- GOM lease payments are a fraction of US oil import bill (11% 1974-82, 8% 1983-2000), so US could afford to gamble with them in the pursuit of lower oil import dependence

But what about those governments for whom the real costs of oil production include the costs of running their respective countries?

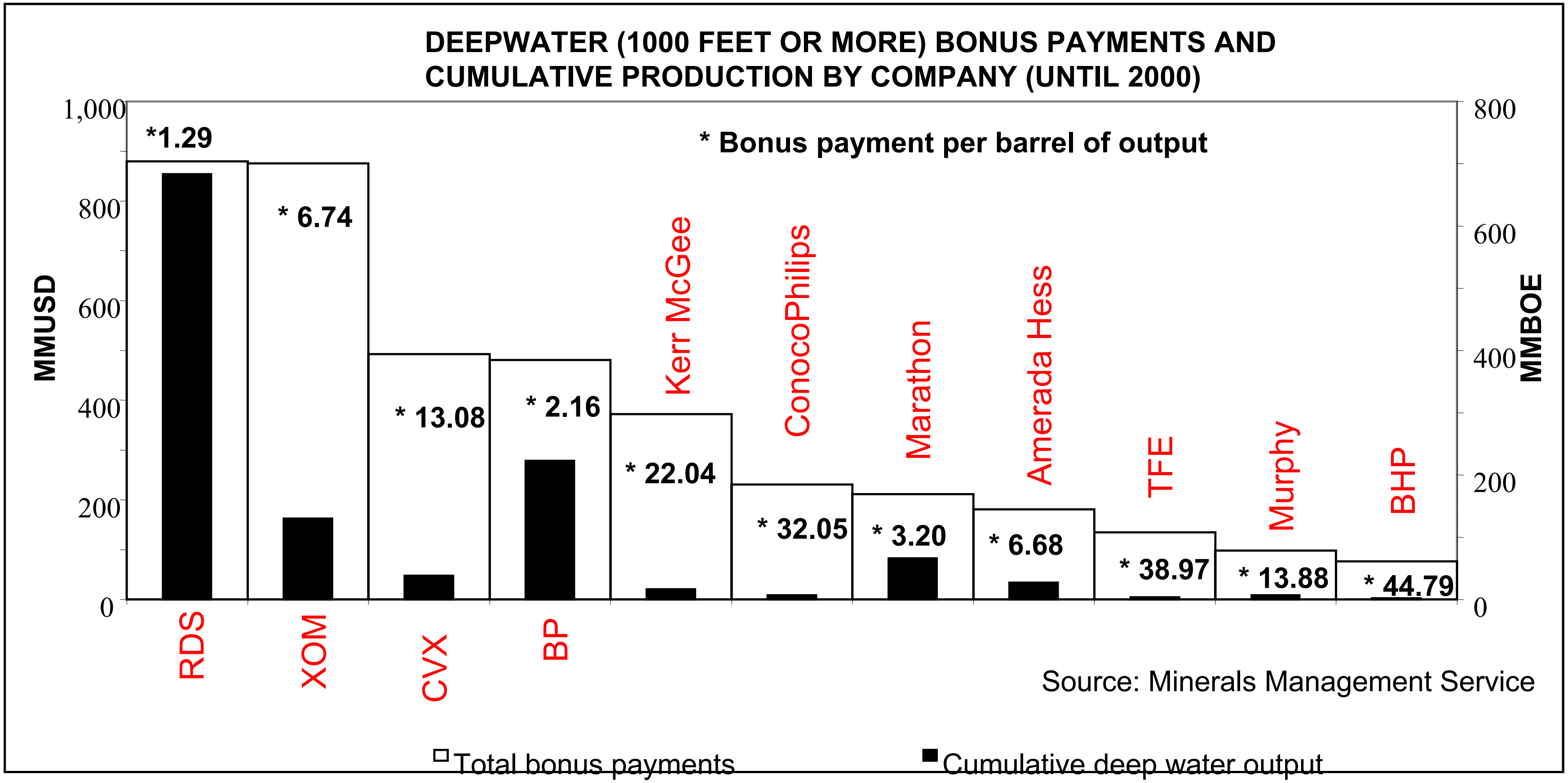
FISCAL TAKE AS A PROPORTION OF GROSS E&P REVENUES FOR SELECTED PETROLEUM PROVINCES, 1976–2000



Sources: Minerals Management Service, PEMEX

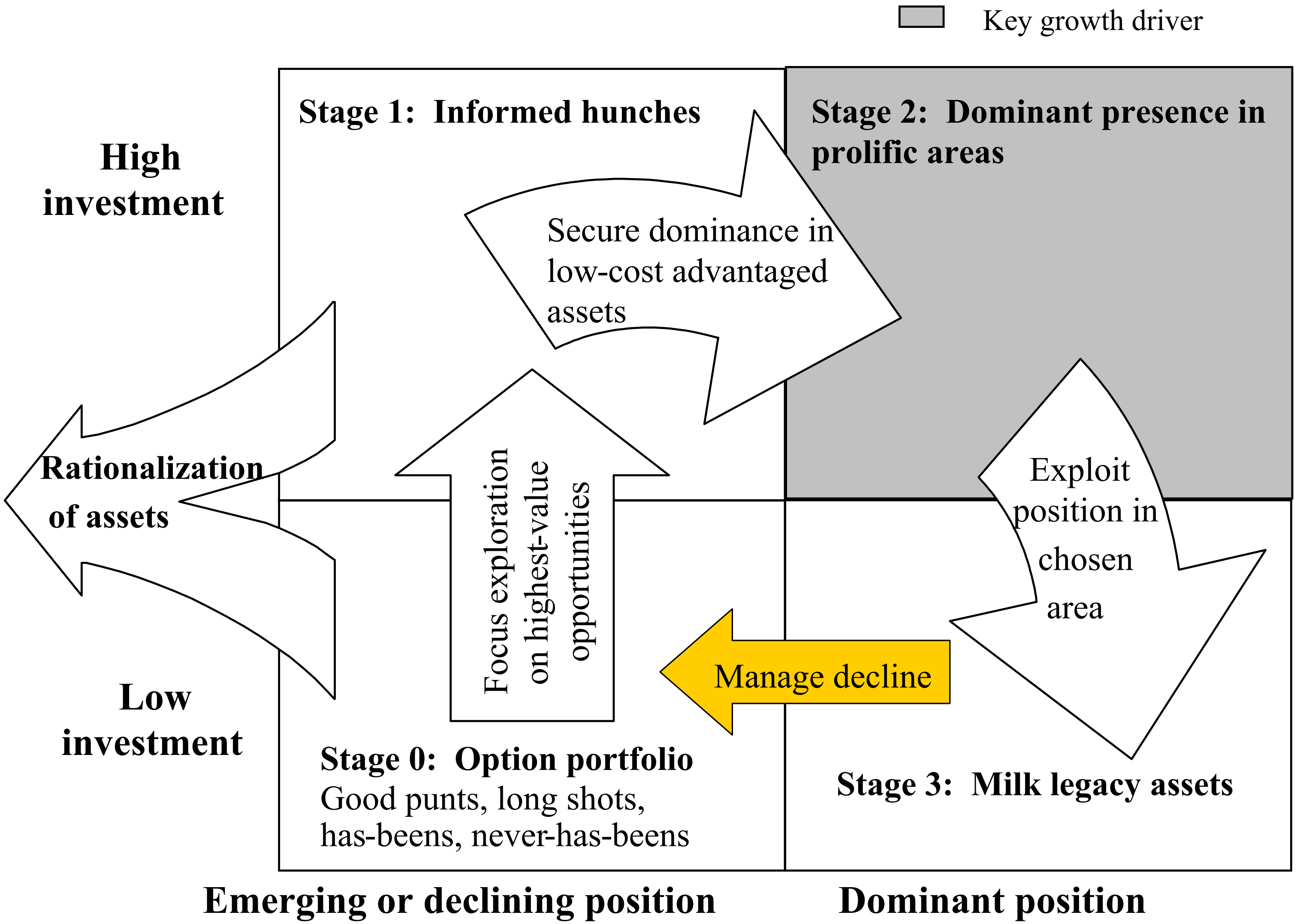
WHAT LESSONS SHOULD WE DRAW FROM AWL? THE COMPETITION DIMENSION

- *Laissez faire* policies have negative effects on industry structure and concentration.
- Fiscal sacrifice of AWL was pernicious as well as futile: by increasing risk aversion of smaller players, it rendered them unable to compete for acreage, shut them out of deep water, and sacrificed their entrepreneurial dynamism



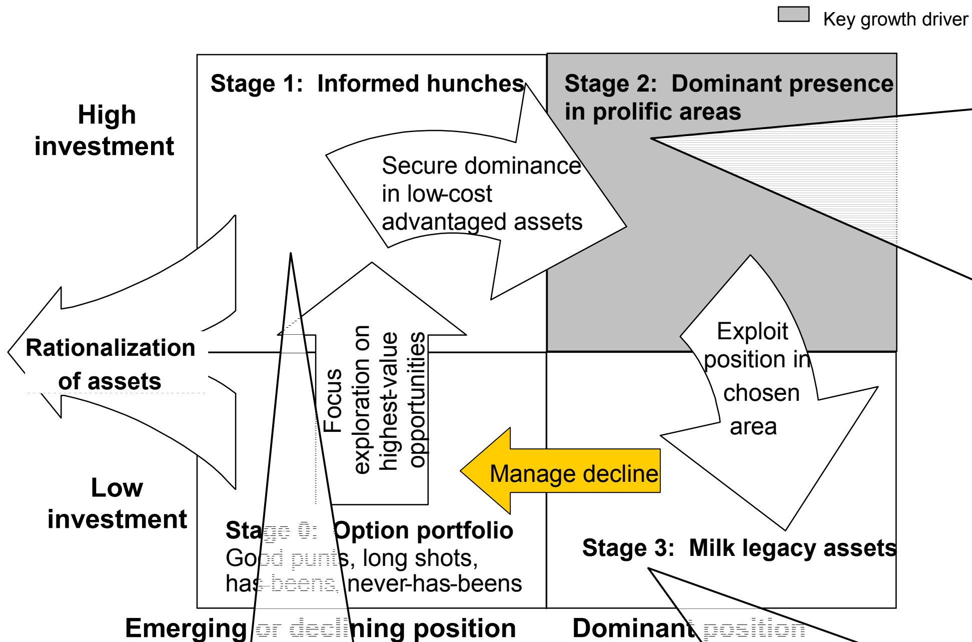
- The only consolation for MMS is that current deep water lease ownership pattern is clearly not the product of a collusive agreement

FIGURE F12.1: THE FOCUSED APPROACH TO CREATING VALUE IN GLOBAL E&P



SOURCE: McKinsey and Company. Used by permission.

COMPANIES CAN ONLY SECURE SUCH DOMINANT POSITIONS IF GOVERNMENTS, *AGAINST THEIR BEST INTERESTS,* DO NOTHING TO PREVENT IT



- Approach to E&P based on “*winner takes all*”*notion: “playing to capture disproportionate share of value creation potential”
- Objectives of *WTA*: owning best acreage/key infrastructure (control of basin development; rent extraction by infrastructure: 60% added to RDS field development value in GOM)
- In oil, *WTA* creates entry barriers linked to land access and tenure (which are more difficult to surmount than technology and capital barriers)

- Majors advantaged in placing wildcat bets on frontier plays
- Initial discoveries *often* made and developed by majors

What is the attraction of legacy assets?

- ***For incumbent companies:*** lower operating/drilling costs (scale/experience), low tract acquisition costs, bargaining position against host and competitors enhanced
- ***For governments:*** less competition for tracts, lower acreage prices, higher upstream entry barriers, increased fiscal dependence on fewer operators, potentially less recovery of oil in place

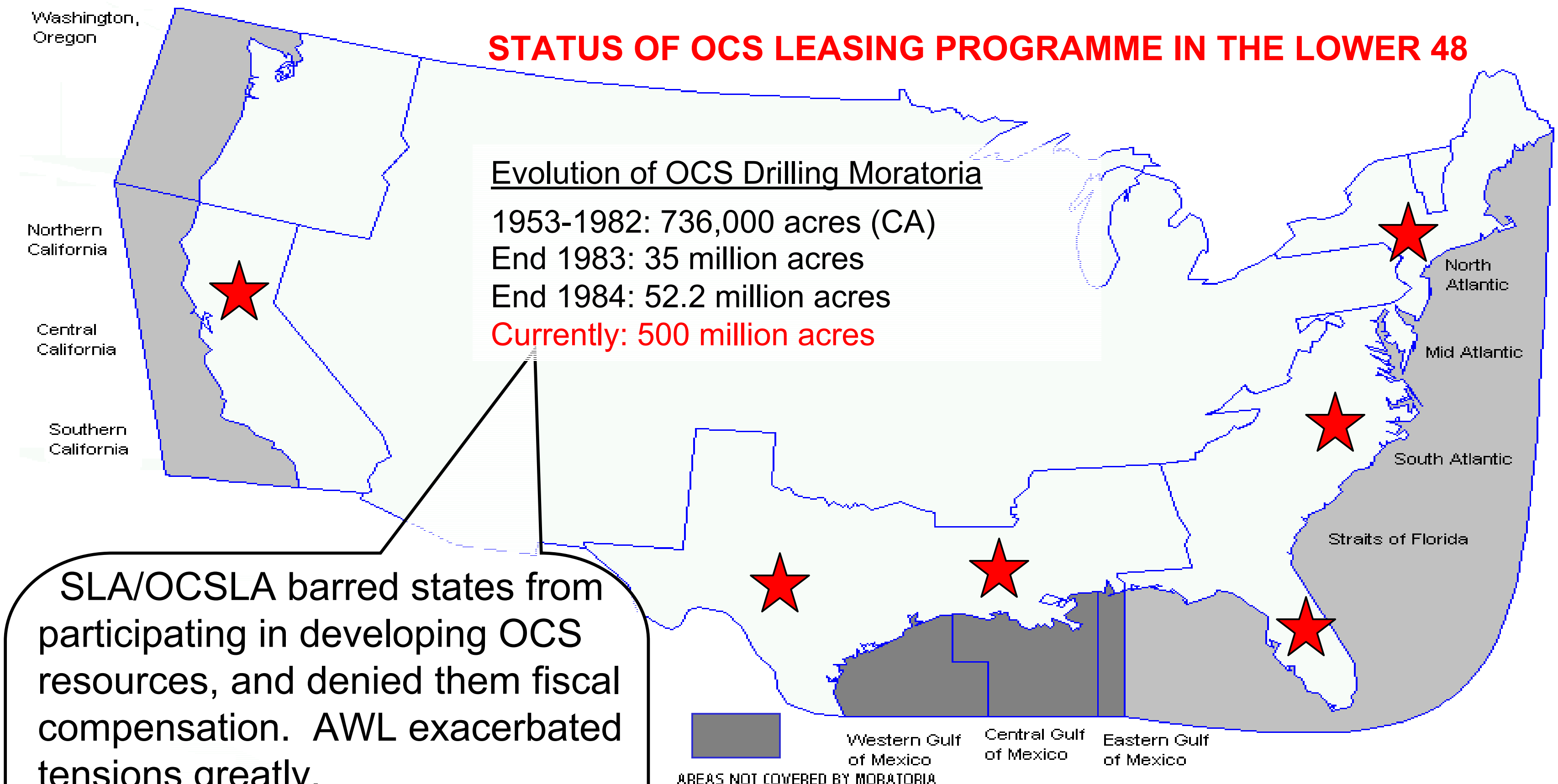
* David Campbell and Ron Hulme “**The Winner-Takes-All Economy**”, *The McKinsey Quarterly*, 2001 (1)

THE POLITICAL LEGACY OF AWL IS PARALYSIS, CONFLICT AND LITIGATION

STATUS OF OCS LEASING PROGRAMME IN THE LOWER 48

<u>Evolution of OCS Drilling Moratoria</u>

1953-1982: 736,000 acres (CA)
End 1983: 35 million acres
End 1984: 52.2 million acres
Currently: 500 million acres



★ States/regions involved in court actions stemming from AWL

SLA/OCSLA barred states from participating in developing OCS resources, and denied them fiscal compensation. AWL exacerbated tensions greatly.

Result?

USA failing to tap significant domestic energy resources despite concerns about oil imports

Q: Will something similar happen in countries stripped of the power to tax oil through legal fetters incorporated in PSAs, BITs and multinational investment agreements (like ECT)?

Source: Minerals Management Service

A MODEST PROPOSAL: NEITHER *LAISSEZ FAIRE* NOR FLEXIBLE FISCAL REGIMES HOLD THE KEY FOR INCREASING OUTPUT … BUT COMPETITION IS JUST THE TICKET

Limitations of optimal taxes to stimulate output

- Taxes make little difference in terms of ultimate recovery: in Wyoming, reducing severance tax by 2% estimated to increase oil recovery by one per cent and employment by 300 persons over 60 years, while fiscal revenue falls by 17 per cent*

Why do so many firms ask for tax breaks?

- Profitability in many basins compromised by stunted competition (i.e. dominant positions)
- Central North Sea: 50 per cent of fallow discovered reserves in province (1.8 MMBOE); taxes cannot be lower but Forties System only game in town (£0.45 Bbl base tariff, scaling up to £1.25)

Recognition of the facts of life

- If depletion has set in, tax and production incentives are akin to ploughing in the sea
- In the real world, one "has to choose between imperfections of information or imperfections of competition" (J. Stiglitz)

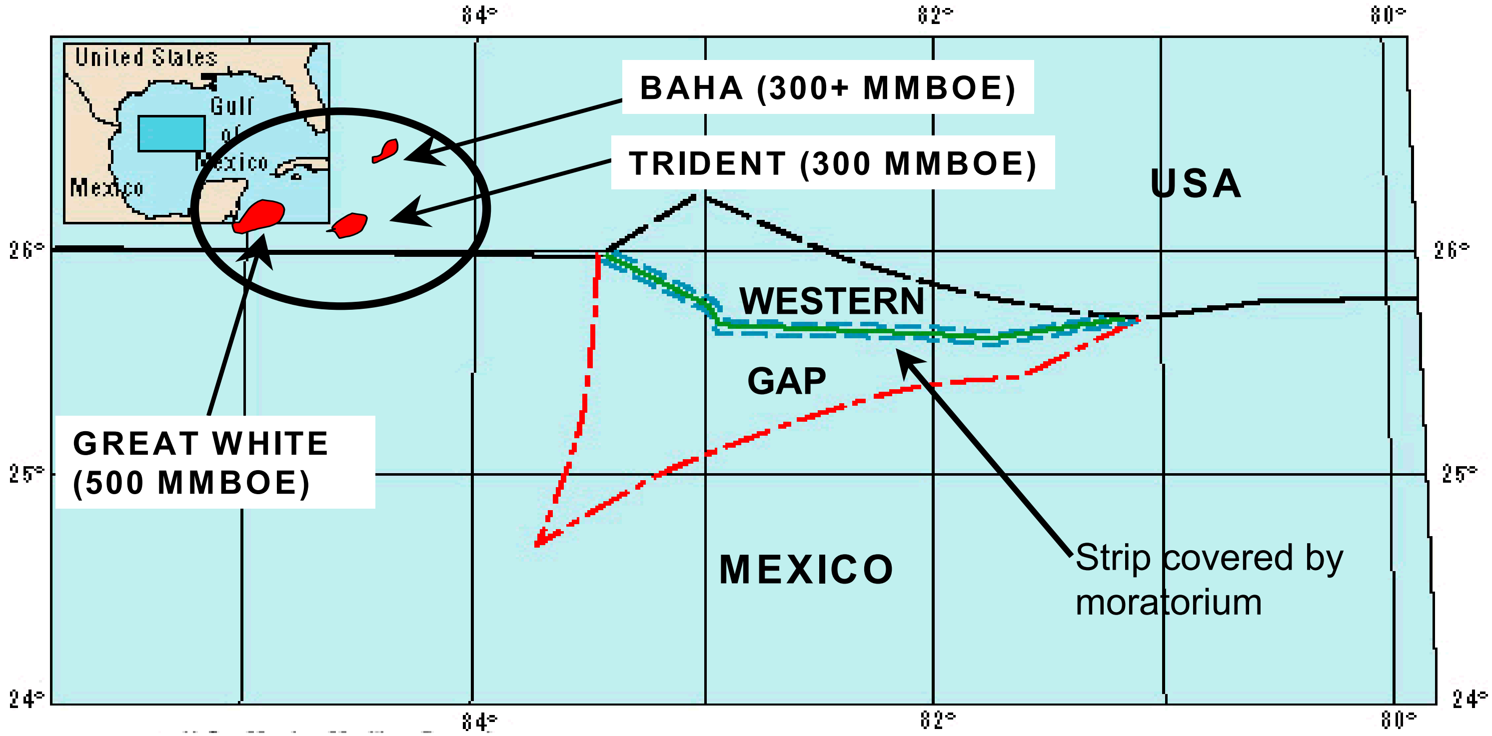
Role of regulation

- Extraction of rents that reflect prospectivity of tracts (and cost/ knowledge advantages of majors) requires that governments take steps to dissipate and negate some of these advantages, for the benefit of smaller players (I.e allocations to be distorted away from first-best to low-powered schemes).

* Shelby Gerking *et. al.*, *Mineral Tax Incentives, Mineral Production and the Wyoming Economy*. Wyoming Legislature, Cheyenne (2000)

OIL PRODUCERS NEED TO DIGEST LESSONS OF AWL QUICKLY, BUT NONE MORE SO THAN MEXICO

- Soon (2010 at the latest, when drilling moratorium on western gap border expires) the Mexican government have to open the Mexican deepwater area to private investment, to prevent drainage of reserves from its side of the border.



- The Mexican government, unaccustomed to practicalities of granting licences, should look northwards (but at the TN system, not AWL!) for guidance on how to do it: small blocks, frequent block offerings, cash bonus bidding, vigorous regulatory presence