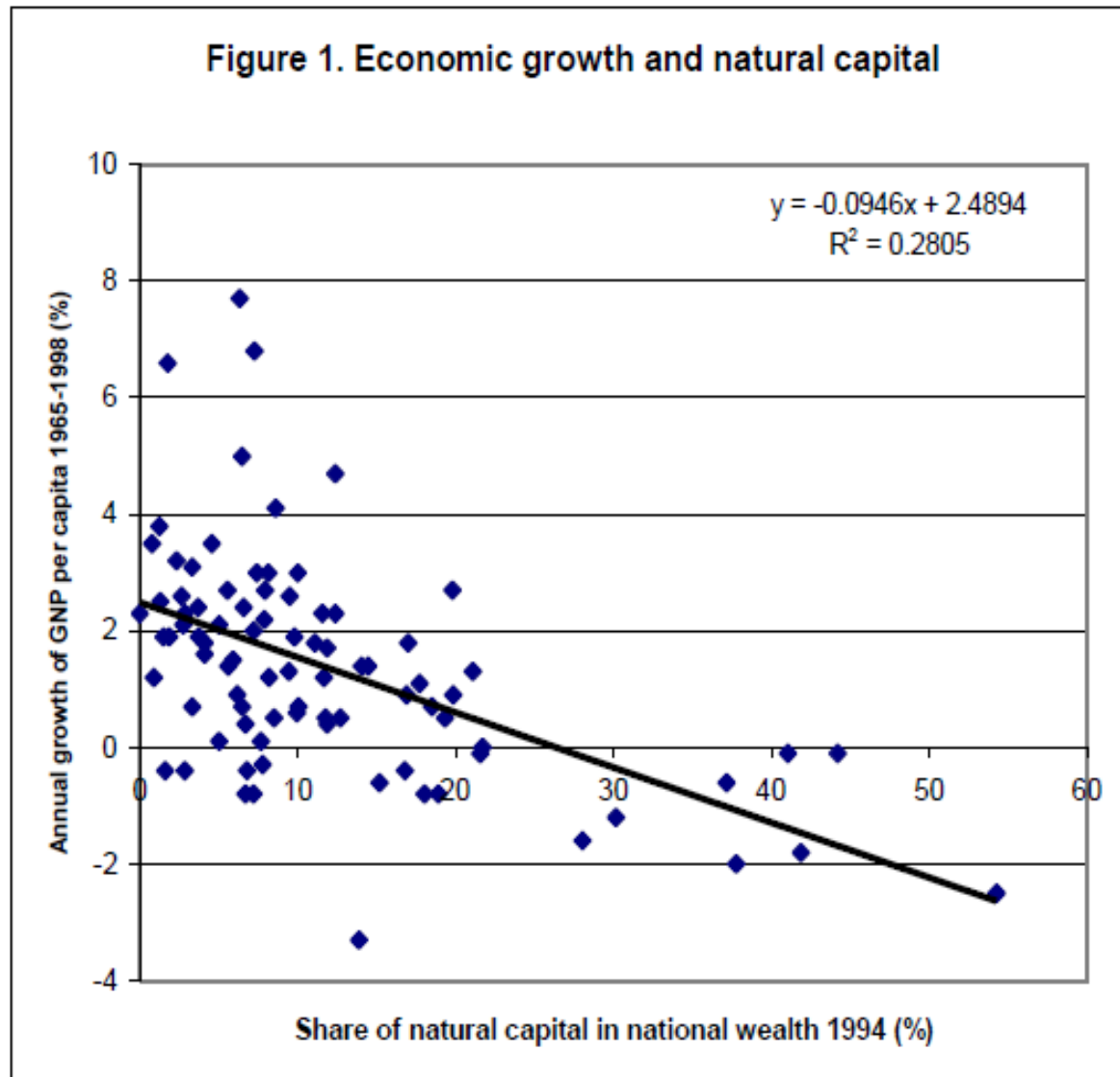


Offshore Oil and Gas Taxation in Israel

Eytan Sheshinski

The “Curse of Natural Resources”



Major Characteristics of exhaustible natural resource extraction:

1. Sunk Costs

Large sunk costs create, from a tax point of view, a ***Time-Consistency*** problem. Taxation of Variable profits, disregarding sunk costs may crowd out ***Ex-Ante*** profitable investments (where some costs are fixed but not yet sunk).

The rise of natural resource prices, such as gas and oil exacerbates this problem (as witnessed recently in Venezuela, Ecuador, Bolivia, and other countries).

2. Risks

Investments in extraction of a natural resource have three stages: Exploration, Development and Production.

There are major risks at the exploration stage and smaller risks (technological risks, price uncertainty, etc.) later on.

In order to preserve investment incentive, taxation must take account of these risks, particularly by expensing unsuccessful explorations, whose expected value should be deductible from the tax bases.

Example:

Exploration costs of \$10 have a 10 percent chance of success in which case the sale yields on income of \$160. It is inadequate to allow a deduction of \$10, that is to tax \$150, since expected return would then be negative.

The maximum tax is \$60. Then the investor has a 10 percent chance to earn \$90 and this exactly cancels the 90 percent chance of losing \$10.

The \$60 profit represents the *expected-rent* on the investment.

3. Exhaustibility

Higher extraction of an exhaustible resource at any time implies a smaller extraction later-on. This “substitution” has important implications:

- Marginal costs do not reflect only variable costs but also the alternative lower expenditures in the future.

- Optimal extraction entails that the '*shadow-price*' of the resource increases overtime at a rate equal to the interest rate plus the increase in extraction costs due to the decrease in the level of the deposit.

Special case: in the absence of extraction costs, the unit price of the resource rises at a rate equal to the interest-rate ("*Hotelling Rule*")

A higher rate of interest accelerates the extraction rate.

Tax Instruments

Royalties – a fixed tax rate based on revenues.

Advantages: Relative stability in tax revenues and limited possibilities for manipulations.

Disadvantages: Has the same distortions as indirect taxes with negative effects on the level of output and on the number of firms in the industry.

Rent Taxation Based on R or IRR

Cash-flow based taxation requires either the reimbursement of taxes on *negative flows* or, if the tax is only on positive flows (as in the Sheshinski Law), to take account of the time elapsed from the exploration and development stages to the point in time when the flow becomes positive. It is important that taxation recognizes the *timing* of costs, since typically four to six years pass between the early stages to the beginning of production. The formula in the '*Sheshinski-Law*' is similar, but not identical, to the those in other countries (e.g. Australia).

Tax Mechanism

Following is a terminology for the super-profits tax in the 'Sheshinski Law':

Tax Basis – the definition of taxable profits.

Tax Formula – the formula which determines the tax rate (based on the cumulative incomes and costs).

Tax Rate – tax as percent of the relevant tax basis.

Tax Boundary or '**Ring Fence**' – specification of the activity(ies) which is taxed (say, a specific deposit, or a firm which owns several deposits).

Tax Basis

In our model the basis takes annual income and deducts annual costs including royalties. This is a *cash-flow basis*, that is, included are incomes and expenses reflected in the annual cash-flow. Thus, investments are deducted fully when incurred (full expensing) rather than depreciated over time.

Tax Formula

The chosen formula is based on the so-called “*R-Factor*”, expressing the ratio between cumulative incomes net of taxes (and royalties) paid to the sum of exploration and development costs, all on a cash basis.

Exploration costs (in the denominator of R) are multiplied by a factor, termed “*uplift*”, which is the inverse of the ex-ante discovery probability. This is our method to take into account expected non-recovered costs. Expenditures are compounded by a normative rate of return over the period passed until the beginning of production:

$$R_t = \frac{\sum_{i=T_2}^t (income_i - opex_i - royalties_i - I_i^{other}) - \sum_{i=T_2}^{t-1} (levy_i)}{2 * I^{exploration} + \sum_{j=T_1}^{T_2} (I_j^{development})(1 + r_j^{norm})^{T_2-j}}$$

I^{exploration} - exploration costs until discovery

I^{development} - development costs

I^{investments} - investments during production

I^{norm} - normative rate of interest

R_t = tax basis at time t

T_0 = time of initiation of the project

T_1 = discovery time

T_2 = beginning of production time

Opex = running expenditures

Additional investments made during production are fully expensed (deducted in the numerator of R).

Accordingly, the denominator of R is “locked” after the exploration and development stages.

All additional investments are deducted from the numerator.

Additional development costs are added to the denominator.

The Fiscal System Before the “Sheshinski Law”

- Based on a 1952 Law (details)
- ‘*Government Take*’ is significantly lower than in other countries (International comparison)
(Comparison to OECD countries)
- Effectively no Government Take due to a "Depletion Allowance" (1956) (comparison between sectors).
- Previous attempts to change the 1952 law were unsuccessful.

New Fiscal System

- The new system has started in 2011.
- Government Take increases to 52% - 62%.
- Transition period concessions (until 2014):
Government Take 43% - 59%.

Gas and Oil Tax Components

- Corporate Income Tax (pertains to all the sectors in the country).
- Royalties – set by the 1952 law (depletion allowance cancelled).
- (Progressive) Super-Profits Tax ranging from 20% to 50% – imposed after full return of investment.
- Accelerated Depreciation.
- Transition concessions (production initiation before 2014).

Progressive super-profit tax on oil and gas

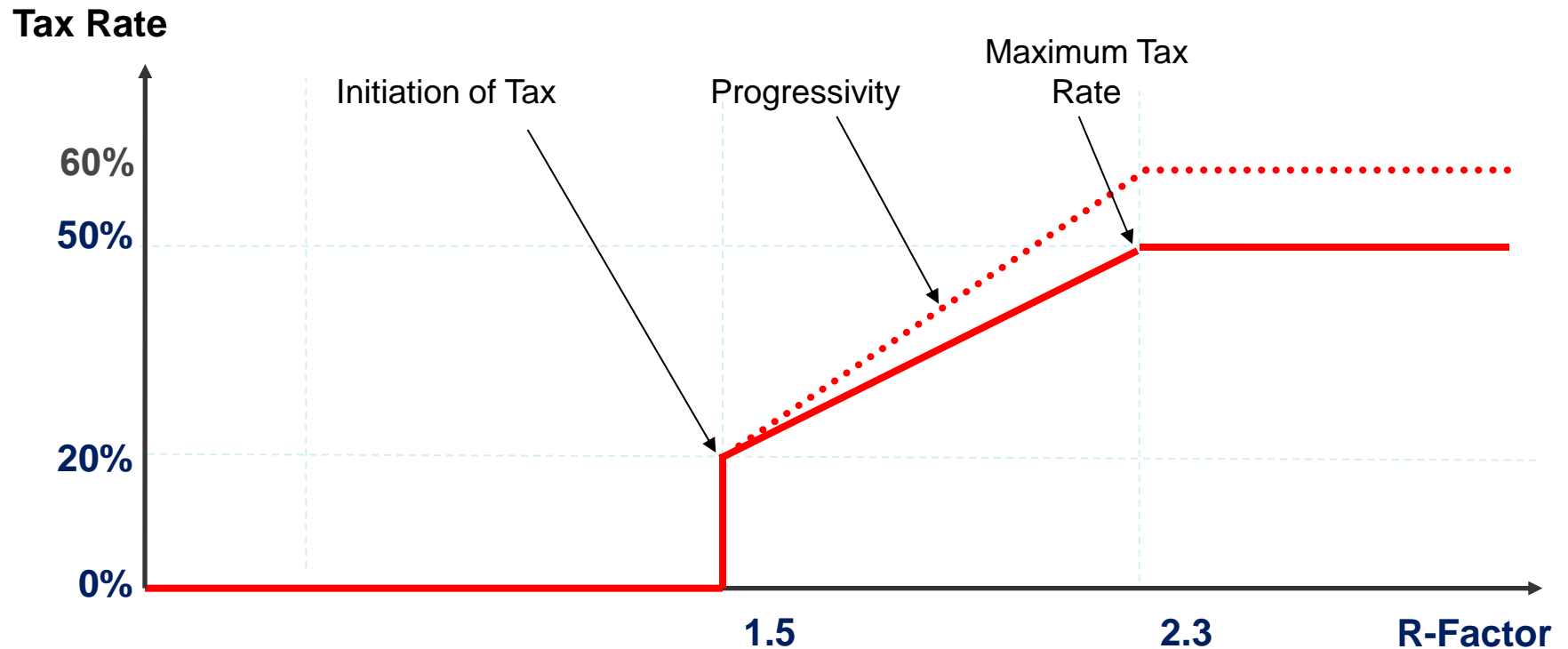


Illustration of Tax Progressivity

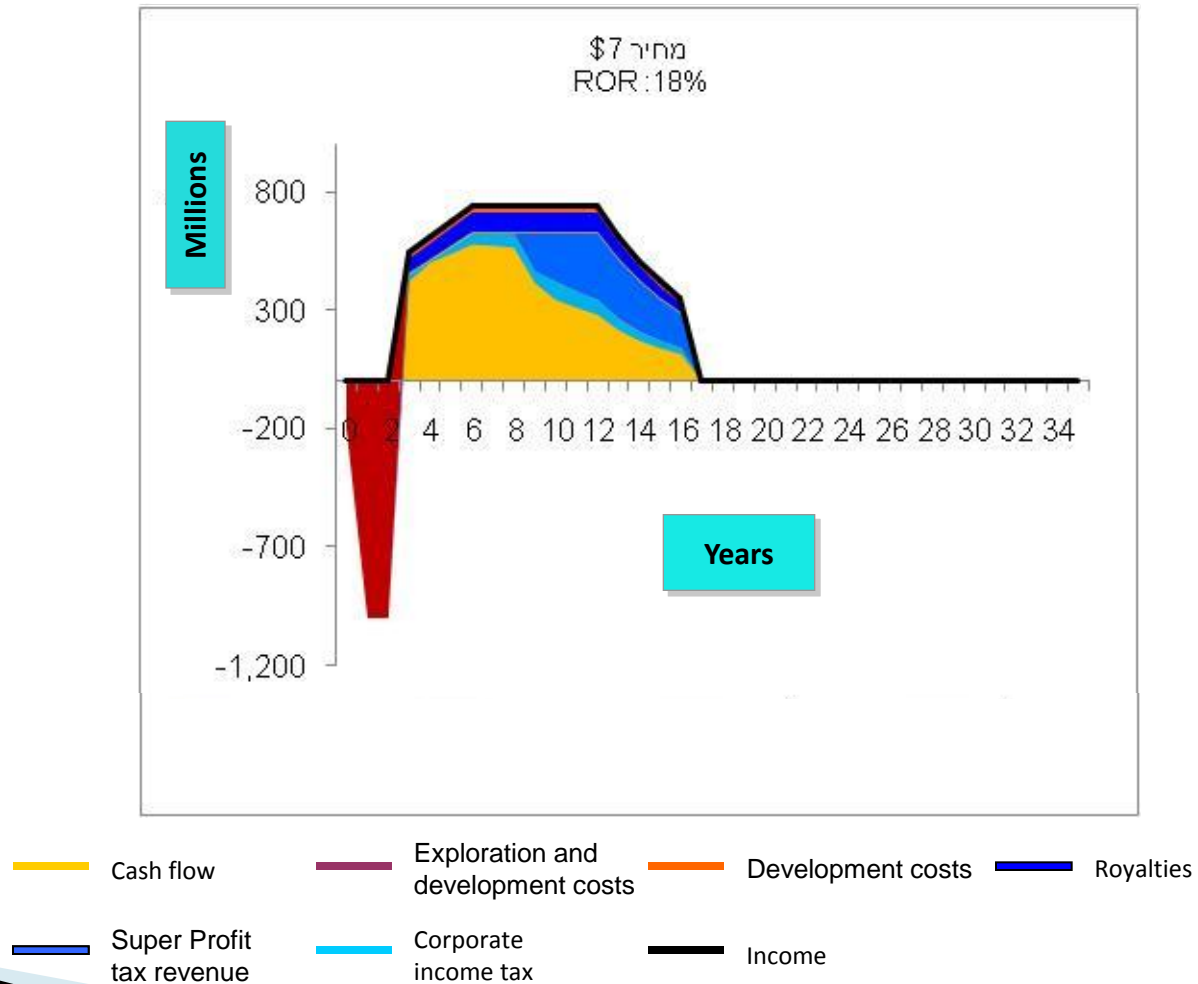
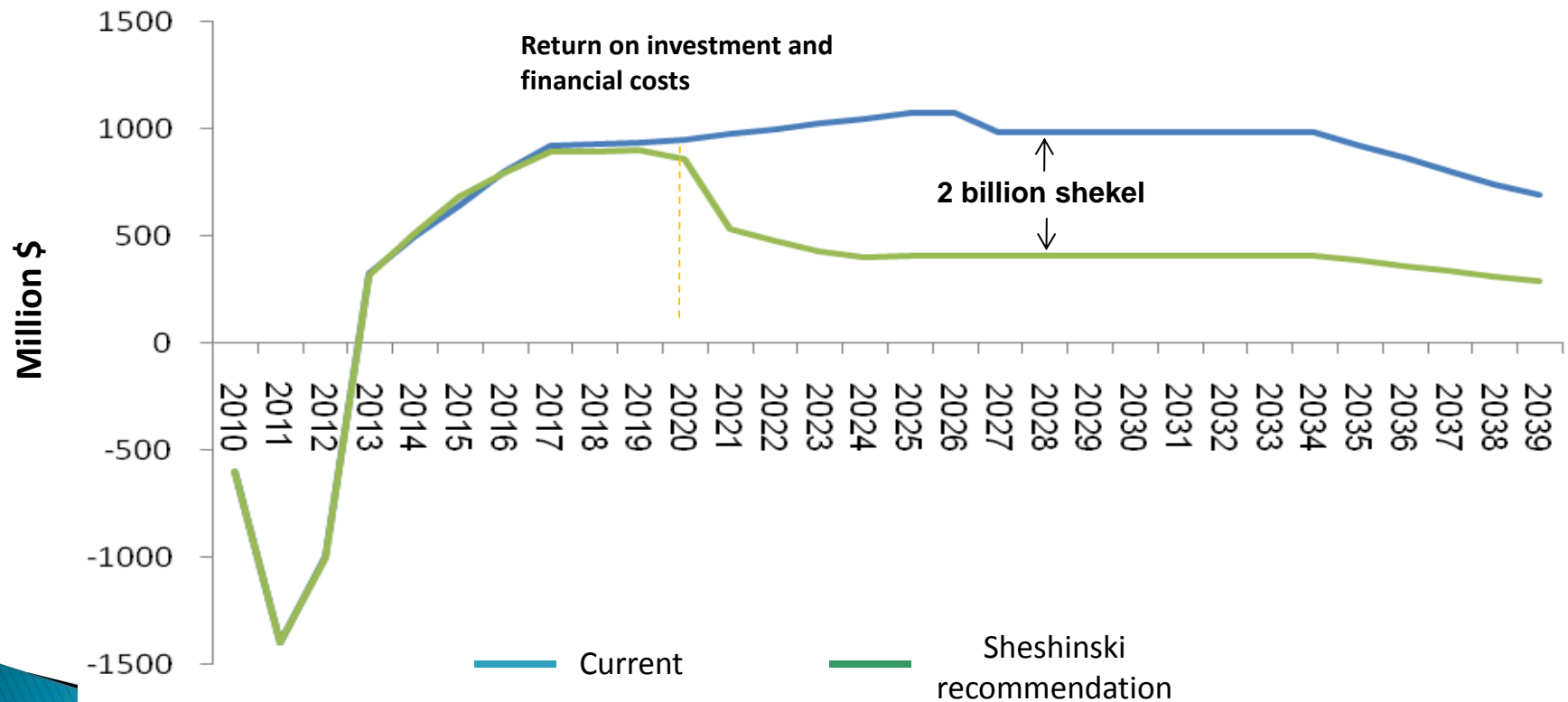


Illustration – Influence of the New Fiscal System on Tamar (BCM 250)

Transition Period	Long Term	Average	Current System	
18.8%	17.9%	16.5%	21.2%	Rate of project
49	47	38	89	Variable profits
10	8	7	-	Year super profit is initiated

Rate of return when Super Profit Tax begins: 15%.

Tamar Cash Flow (BCM 250) – before and after the "Sheshinski Law"



Influence of the model on “Tamar” cash-flow

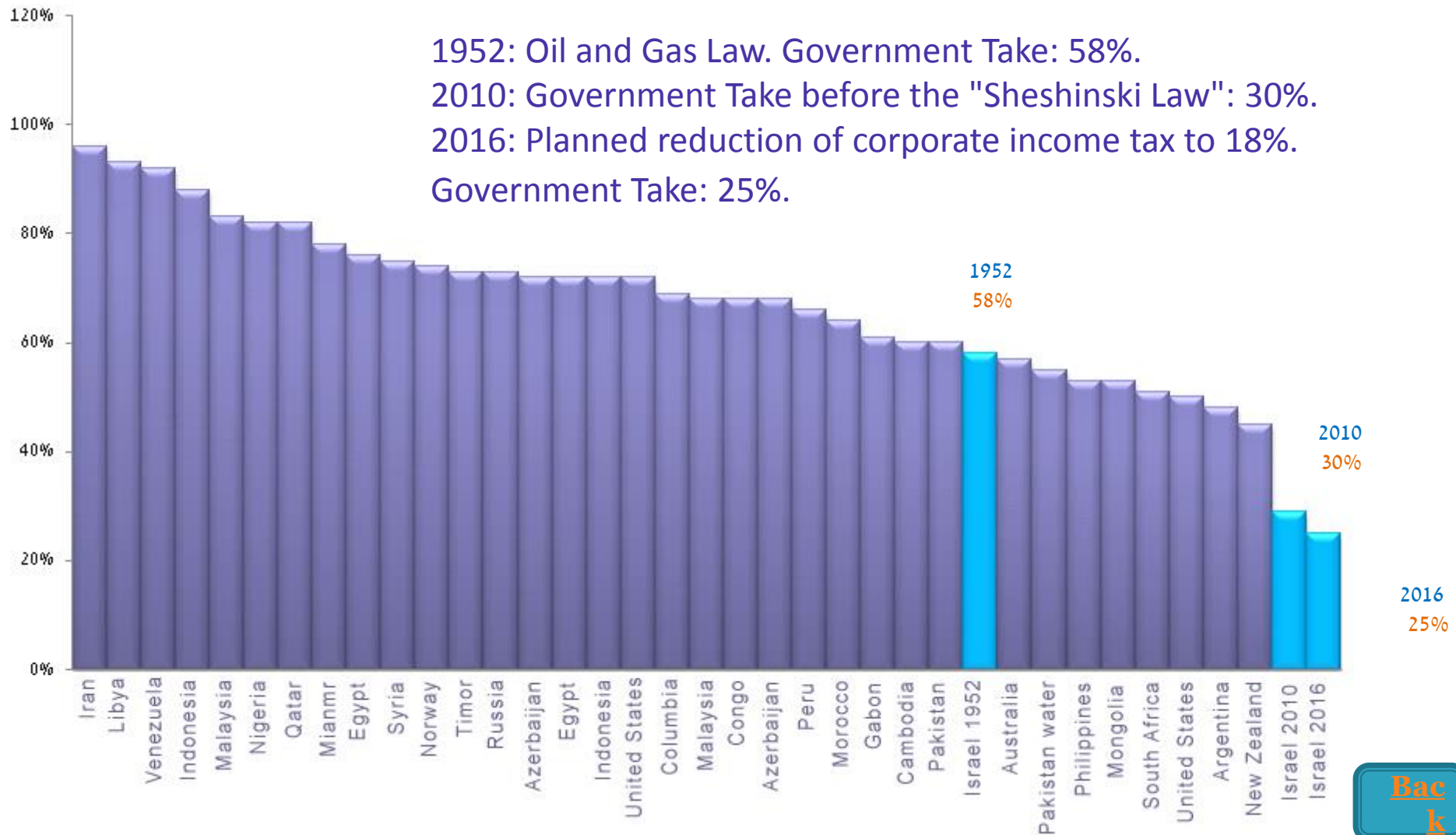
The new rules do not affect the cash flow during the first ten years.

		1	2	3	4	5	6	7	8	9	10
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Cash flow	Current system	0.3	0.5	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9
	Transition	0.3	0.5	0.7	0.8	0.8	0.9	0.9	0.8	0.7	0.7
	Ratio of flows	100%	103%	108%	101%	99%	99%	99%	91%	76%	76%
Cumulative cash flow	Current system	0.3	0.72	1.24	1.82	2.39	2.97	3.5	3.98	4.42	4.82
	Transition	0.30	0.74	1.29	1.88	2.44	3.01	3.53	3.97	4.3	4.61
	Ratio of flows	100%	102%	104%	103%	102%	101%	101%	100%	97%	96%

Summary

- Taxation according to the “Sheshinski Law” is consistent with world standards of government take.
- The public receives the rent (profits) which reflects the sovereign’s property rights
- The law does not affect the financial borrowing conditions of the private investors.

Government Take Worldwide



Source: Oil & Gas Journal 18 April, 2005.

Government Take in OECD Countries

Country	Government Take (percent)
Norway	75-77
Netherlands	62-66
Denmark	62-64
Canada	60-63
Australia	56-58
UK	45-50
USA (bonuses not included)	47-50

- Government Take according to "Sheshinski Law" is within the OECD range.
- International energy corporations operate mainly outside OECD countries.

Comparison of some state revenue from oil and gas industry with standard industry

	Gas and Oil	Other sectors
Income	100	100
Cost	(20)	(20)
Effective royalties	(11)	
Depletion allowance	(24.5)	
Tax basis	(44.5)	80
Average tax	(14)	(25)
Government Take	25	25
Total payment in percent of profits	31%	31%

Fiscal System Before the “Sheshinski Law”

Payments from the “Tethys Sea” deposit (based on data given by firms)

Year	Corporate income tax rate	Individual income tax rate	Average weighted tax rate	Depletion Allowance (millions shekels)	Royalties (millions shekels)	Tax shield due to royalties and depletion (millions shekels)
2004	35%	49%	38%	130	56	71
2005	34%	49%	37%	175	73	92
2006	31%	49%	35%	246	102	122
2007	29%	48%	33%	277	120	131
2008	27%	47%	31%	337	144	149
2009	26%	46%	30%	333	153	146
Total					649	710

The state lost 61 millions shekels.

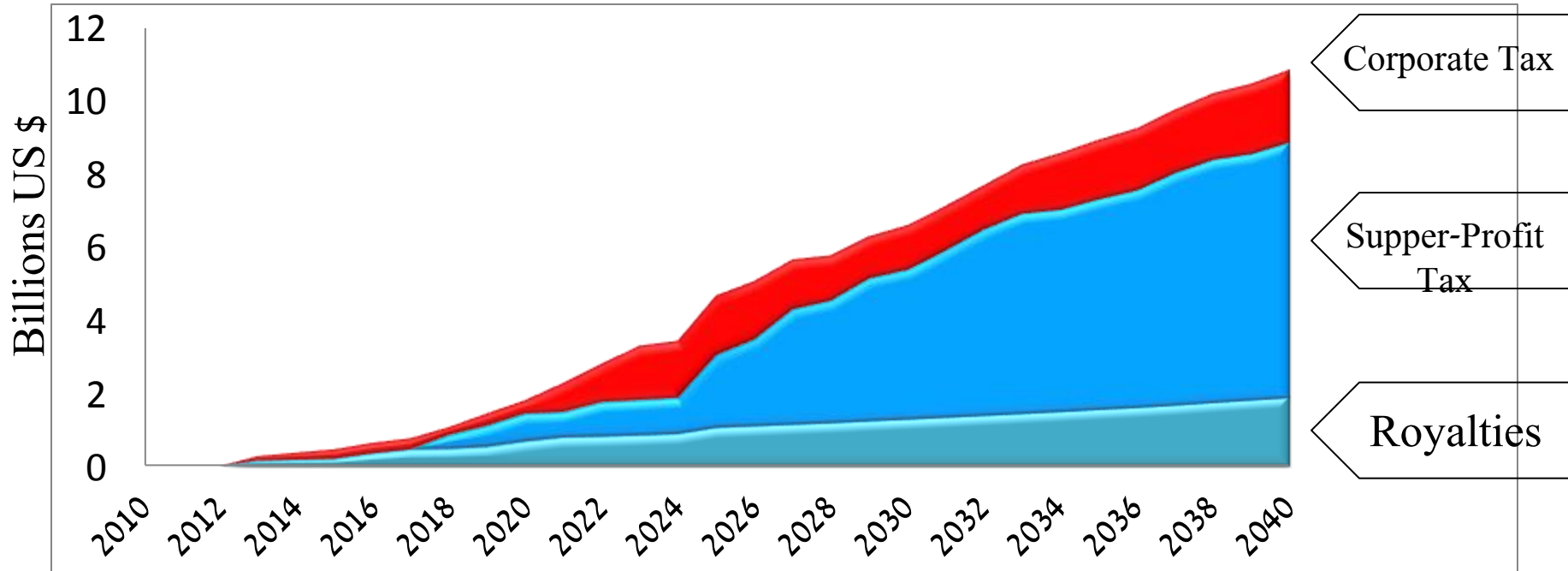
Government income

Income Given Up by the state

Natural Resource Fund

Expected Government Take from offshore Gas

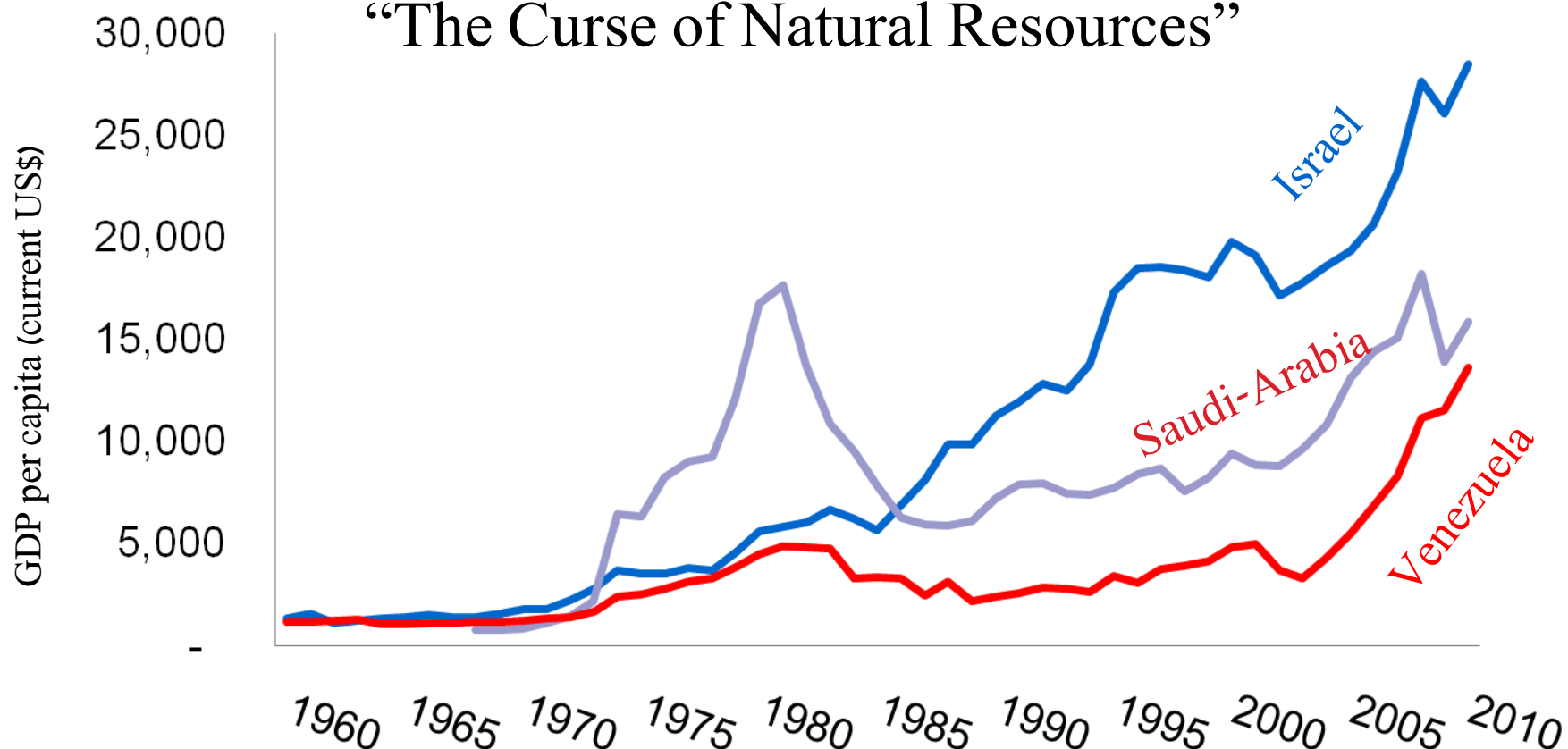
Deposits: Tamar, Leviathan, 3 smaller deposits, total 1,100 BCM, Exports included



	Royalties	Supper-Profit-Tax	Corporate Tax	Total
Income (billions US\$)	29	83	31	143
NPV at 7% (billion US\$)	8	17	8	33

Income From Natural Resources Does Not Always Generate Higher Growth

“The Curse of Natural Resources”



Sorce: World Data Bank

“Dutch Disease”

Export of Natural Resources

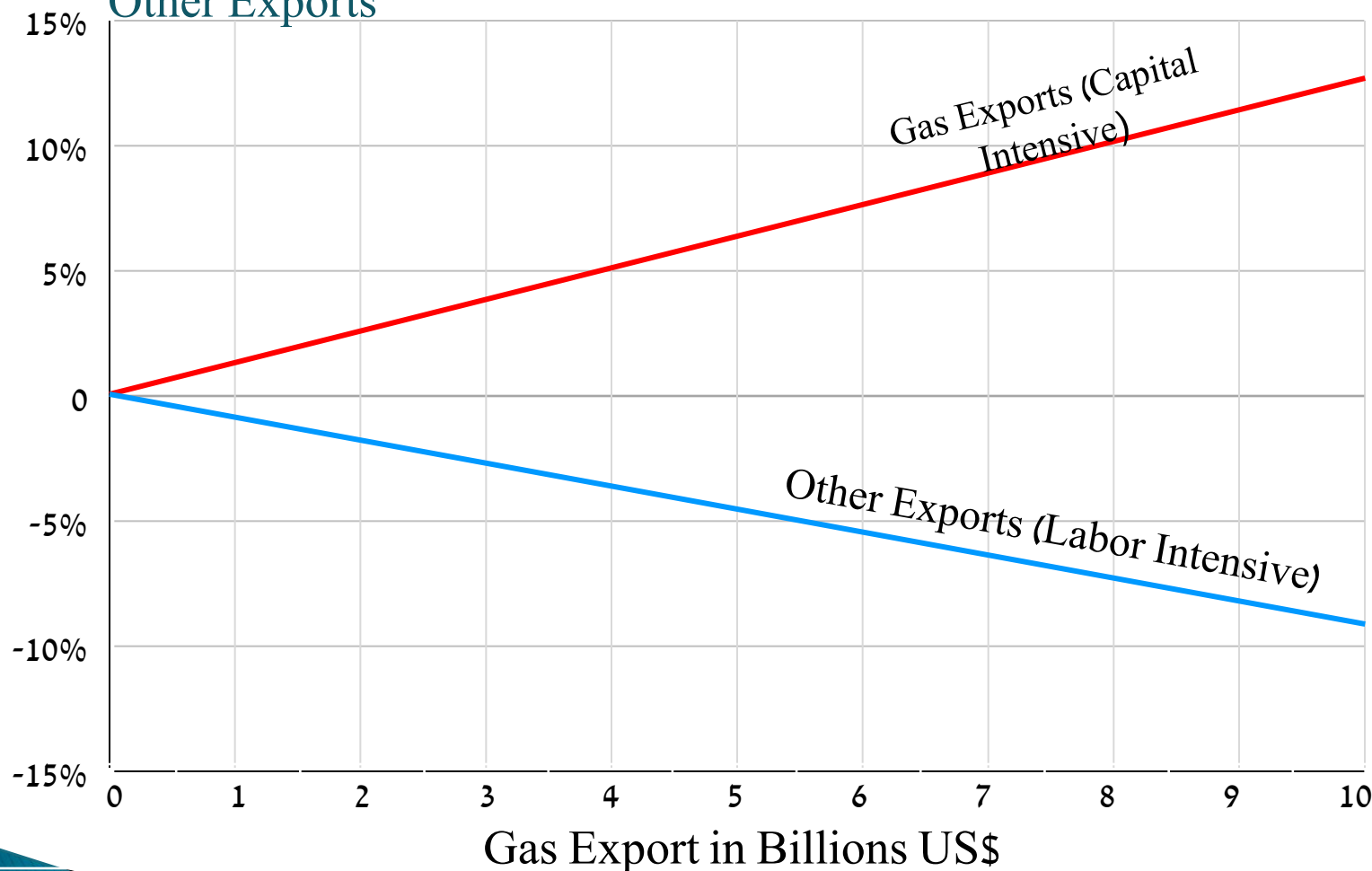
Appreciation of Local Currency

Crowding - Out of Other Export Industry

Negative Effect an Growth and
Employment

Effect of “Dutch Disease” on Israel

Evaluation of the Effect of Gas Exports on the Exchange Rate and Other Exports



Increase in Gas Exports in Billions of US\$

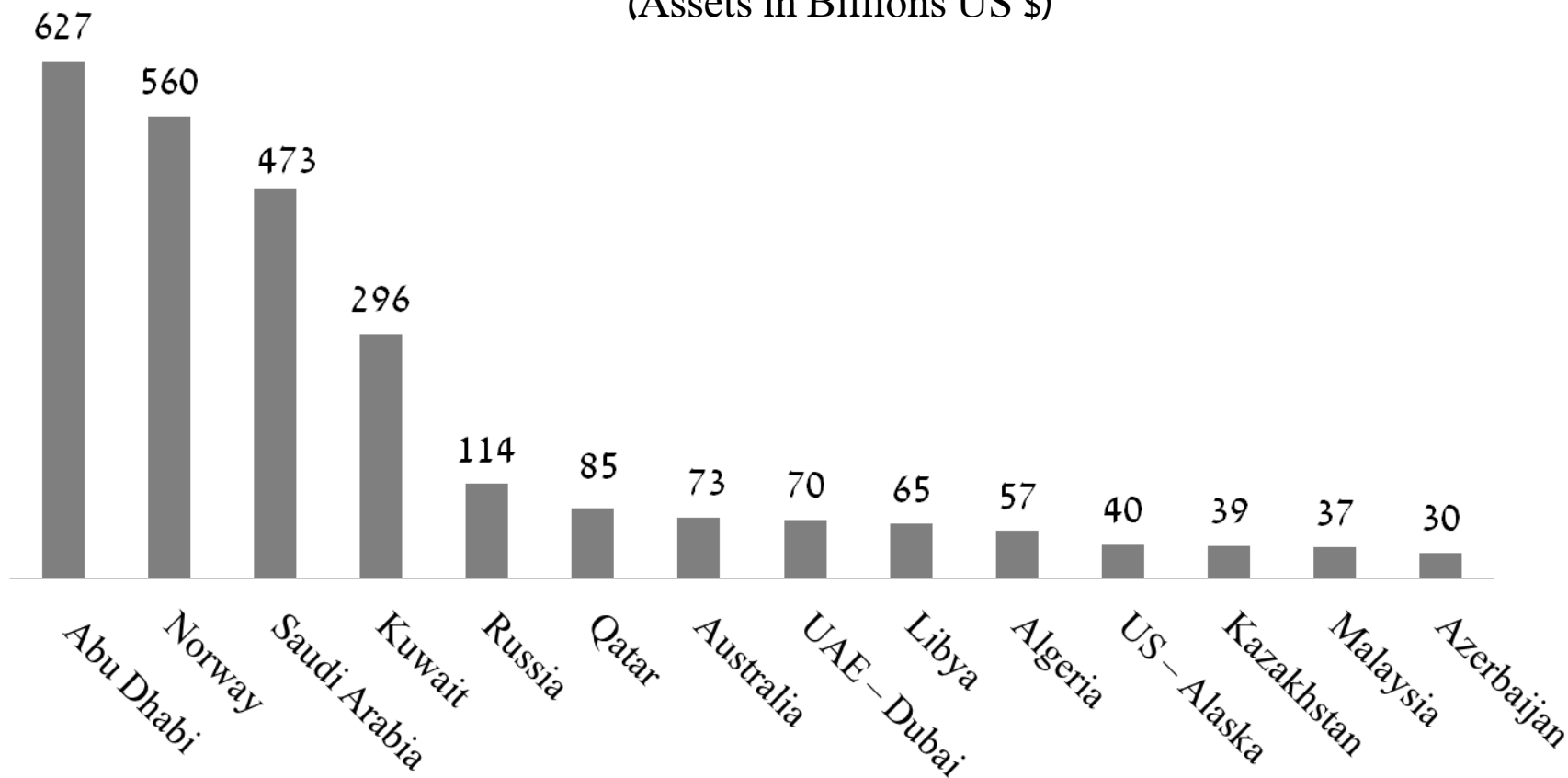
Decrease in other Exports by 0.8 billions US\$

What Can be Done?

- ▶ **Mitigate the Effect of Natural Resource Exports on the Exchange Rate**
- ▶ **Accepted Practice: Establishment of a Sovereign Fund that Invests Abroad.**
- ▶ **Recommendation by IMF ,OECD, andThe World Bank**

Combating the “Dutch Disease” in the World

Leading Sovereign Funds in the World
(Assets in Billions US \$)



- South Africa, Columbia, Nigeria, Ghana, and other countries are in the process of establishing Sovereign Funds

source :SWFI

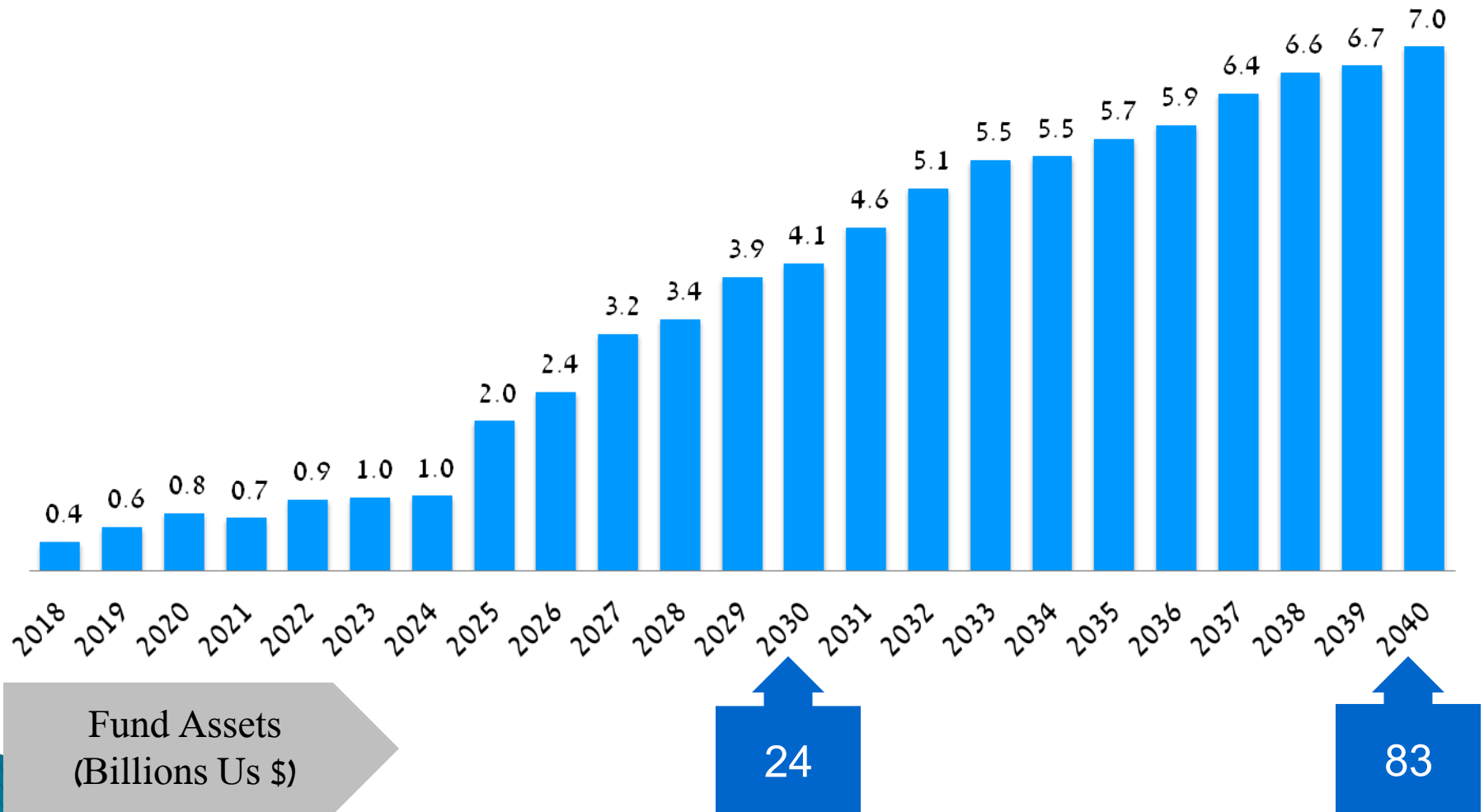
Recommendations

- ▶ **The NRF will implement a just Intergenerational Distribution of the income from gas and oil**
- ▶ **The fund's asset will provide insurance against external events such as war, natural disasters and economic crises**
- ▶ **Prevention of the Dutch Disease**
- ▶ **Adaptation of the Santiago Principles**

Intergenerational distribution mechanism

- ▶ **Gas and Oil Super Profits will be invested abroad by the fund**
- ▶ **Real Interest and Capital gain will be invested annually in designated projects approved by the government**
- ▶ **In exceptional cases the fund can provide loans from the principal**

Expected Inflows to the Fund (Billions US \$)



Expected Returns of the Fund (millions US \$)

