

# Russia and Energy Security

The Aftermath of the Russian Presidential Elections: 38th Annual Outreach Conference in Slavic, East European, and Eurasian Studies

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- Is there any meaning to it aside from war?



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## Sample Statistics of Oil Prices

	1861-1877	1878-1972	1973-2009	1861-2009
Price (2009\$)				
Mean	50.9	17.2	44.7	27.8
Std. Deviation	25.3	5.1	22.1	20.2
Annual Price Changes				
Mean	39.0%	14.2%	22.1%	19.0%
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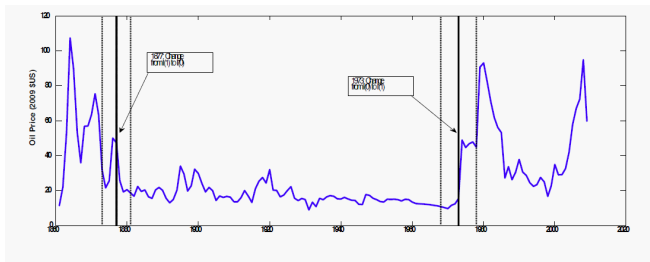
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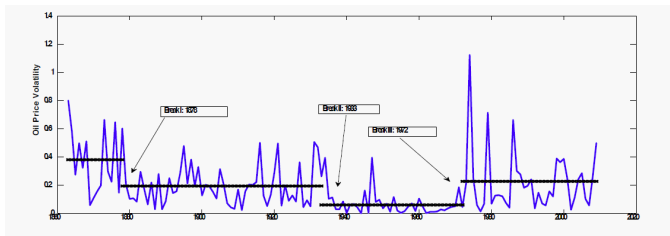
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- We are unlikely to transit back to low volatility regime

# Real Oil Price



# Real Oil Price Volatility



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- Control over the distribution of rents is *the* central problem of Russian Political Economy
- Future of oil and gas rents driven by the volatility of oil prices

# Dependence on Rents

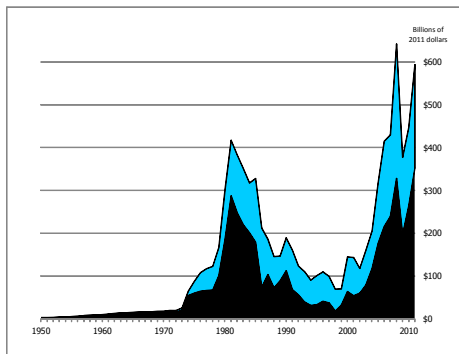
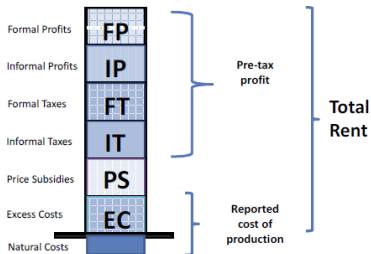


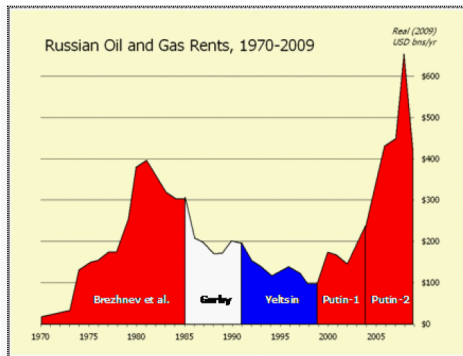
Figure: Russian Oil and Gas Rents Since 1950 (Oil rents in black, natural gas rents in blue)

# Components of Rents

## Categories of Rent Distribution

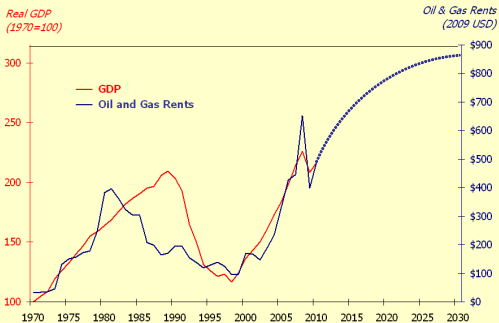


# Resource Rents and Political Economy



# Importance of Resource rents

## Russian Oil and Gas Rents and GDP, 1970-2030



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- there is also a need to secure supply channels for gas by avoiding transit states (return to later)
- Russia frames this as a security issue especially by alleging that its adversaries, US and NATO, can manipulate world oil prices.

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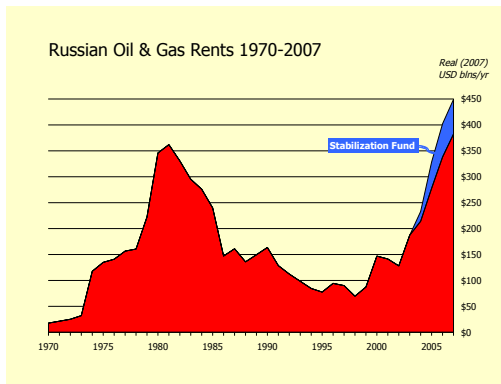
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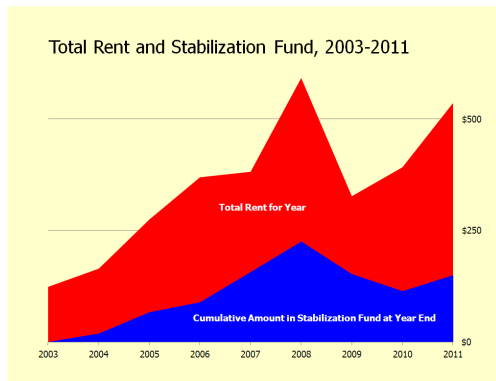
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- Key issue is the rent not the budget

# Stabilization Fund and the Iceberg



# Stabilization Fund, Stocks and Flows



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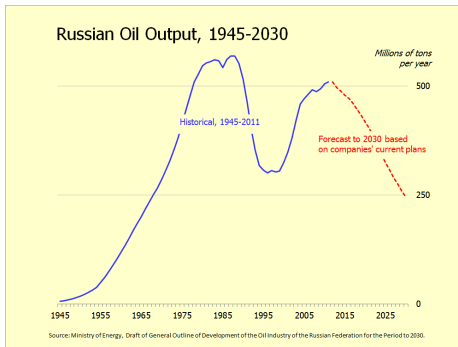
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- Solution is risk sharing

# Russia's Future Oil Output without Investment



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- Russia has to invest in Nordstream and South Stream to assure European markets and counter their efforts to diversify supply
- Long-term gas contracts tied to oil prices transmitted volatility. But gas prices are coming under more pressure due to alternative supplies.
- Russia needs serious investment in gas industry to maintain this key rent source



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- The real problem is that Russia has on top of its efficiency issues some major (real or imagined) security concerns that shape its behavior as well.

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  - The kinds of investment envisioned in those efforts will preserve and reinforce the rent distribution chains.

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- Need expected returns and volatilities to compute optimal portfolio



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  - services least risky, oil most risky

# Optimal Portfolio Shares

Optimal portfolio shares for 1995-2009 data

Rate of Risk Aversion	$\alpha_M^*$	$\alpha_O^*$	$\alpha_S^*$
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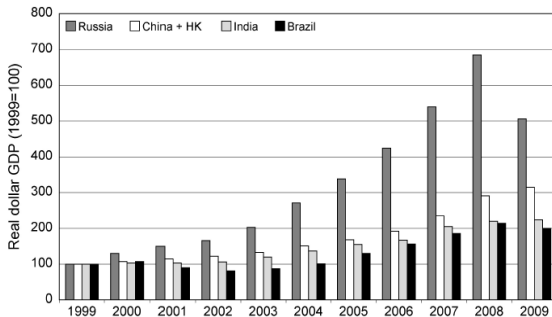
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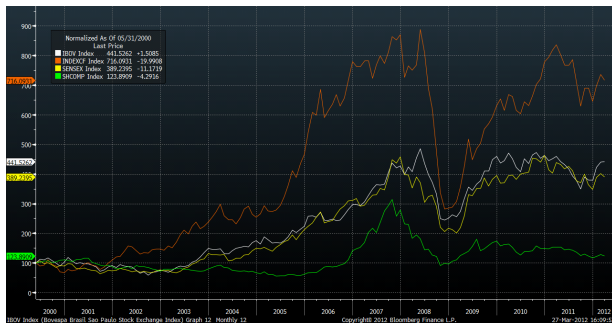
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  - Skip  $M$  move directly to  $S$ , but even this requires high risk aversion



# Should Russia Have Diversified?



# Which BRIC Would You Invest In?



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  - Long-term equity investments (FDI)

- Log energy prices follow an AR(1) process:

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- Final good is both consumption and investment good

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- Intermediates are used as input and exported:

$$Y_{st}^i = y_{st}^i + x_{st}^i$$

# Model

Households own the capital, make savings and consumption decision to maximize

$$E_0 \sum_{t=0}^{\infty} \beta^t \frac{(c_t^H)^{1-\nu}}{1-\nu}$$

subject to the budget constraint

$$\begin{aligned} p_{ft} & \left( c_t^H + I_{et}^H + \delta_m \bar{K}_m^H + \frac{\psi_b}{2} b_{Ht}^2 + \frac{\psi_a}{2} \sum_{i=H}^F \sum_{s=e}^m (a_{Ht}^{si} - \bar{a}_H^{si})^2 \right) \\ & + b_{Ht} + \sum_{i=H}^F \sum_{s=e}^m a_{Ht}^{si} p_{at}^{si} \\ = & R_{mt}^H \bar{K}_m^H + R_{et}^H K_{et-1}^H \\ & + \sum_{i=H}^F \sum_{s=e}^m a_{Ht-1}^{si} (p_{at}^{si} + d_t^{si}) + R_{bt-1} b_{Ht-1} \end{aligned}$$

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- Countries have balance of payments

$$x_{mt}^i + p_{et}x_{et}^i = b_{it} - R_{bt-1}b_{it-1} + \sum_{j=H}^F \sum_{s=e}^m p_{at}^{sj} (a_{it}^{sj} - a_{it-1}^{sj})$$

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- ② Bond economy:

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- 4 Long-term equity investment (FDI):

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- around the deterministic steady state ( $\sigma = 0$ ).



## Parameters Set Without Solving the Model

Parameter	Definition	Value
$\beta$	discount factor	0.96
$\rho$	persistence of oil shocks	0.95
$\sigma_u$	std deviation of oil price shocks	0.05
$\gamma_1$	input share of manufacturing	0.9
$\gamma_2$	elasticity of substitution (m&e)	0.1
$\alpha$	returns to capital	.36
$\delta_m$	depreciation of manufacturing capital	.05
$\delta_e$	depletion of energy reserves	.03
$\nu$	risk aversion	2

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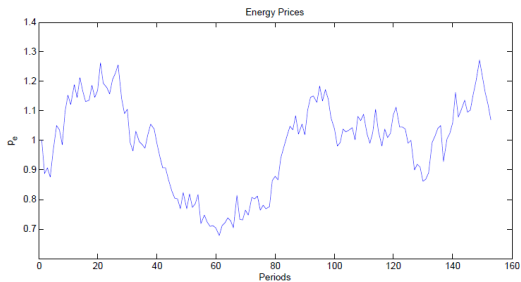
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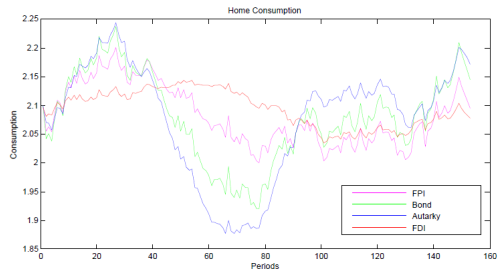
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# Results: A Sequence of Shocks

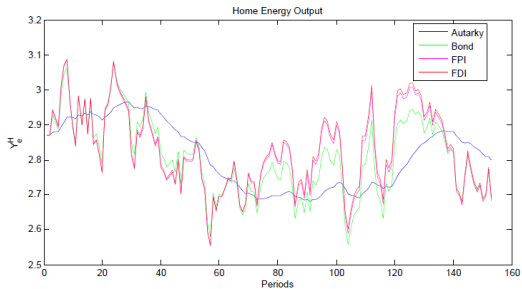


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- Consumption is smoother for both Home and Foreign

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- *Conjecture*: If we introduce lumpy investment process for energy – high fixed costs – then we expect financial integration has bigger effect on energy security

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- Russia chooses self insurance, manage the problem of its future oil on its own

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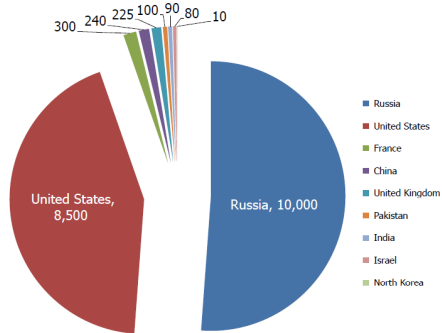
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Thank You

# First Addiction

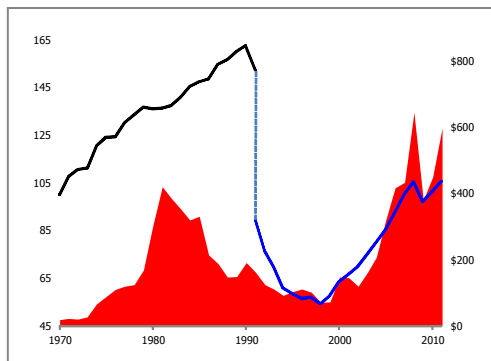


Figure: Soviet and Russian Oil and Gas Rents, 1970 – 2011