Forecasting of Russian economy

Energy sector model

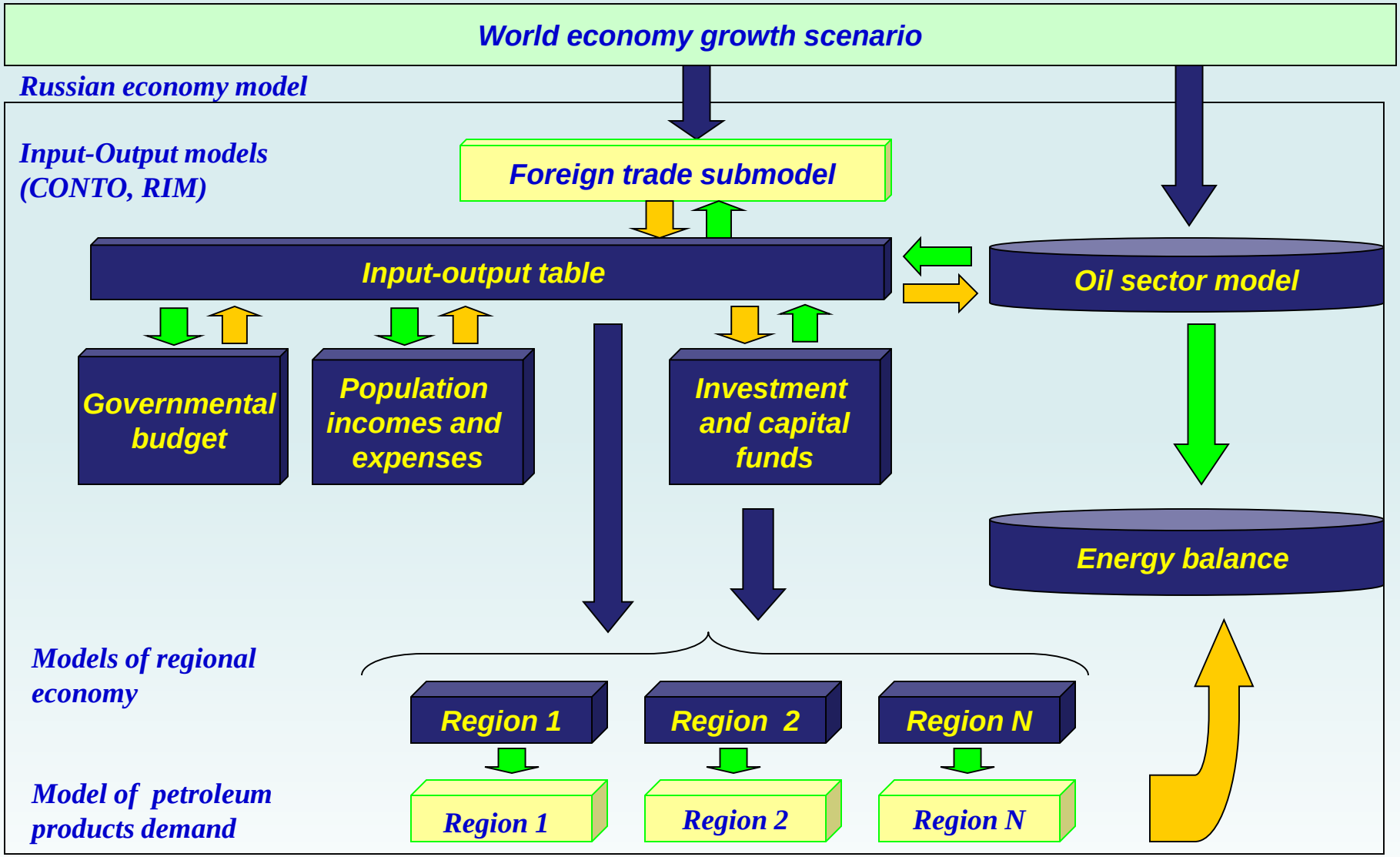
Alexandria
September, 2014

IEF RAS

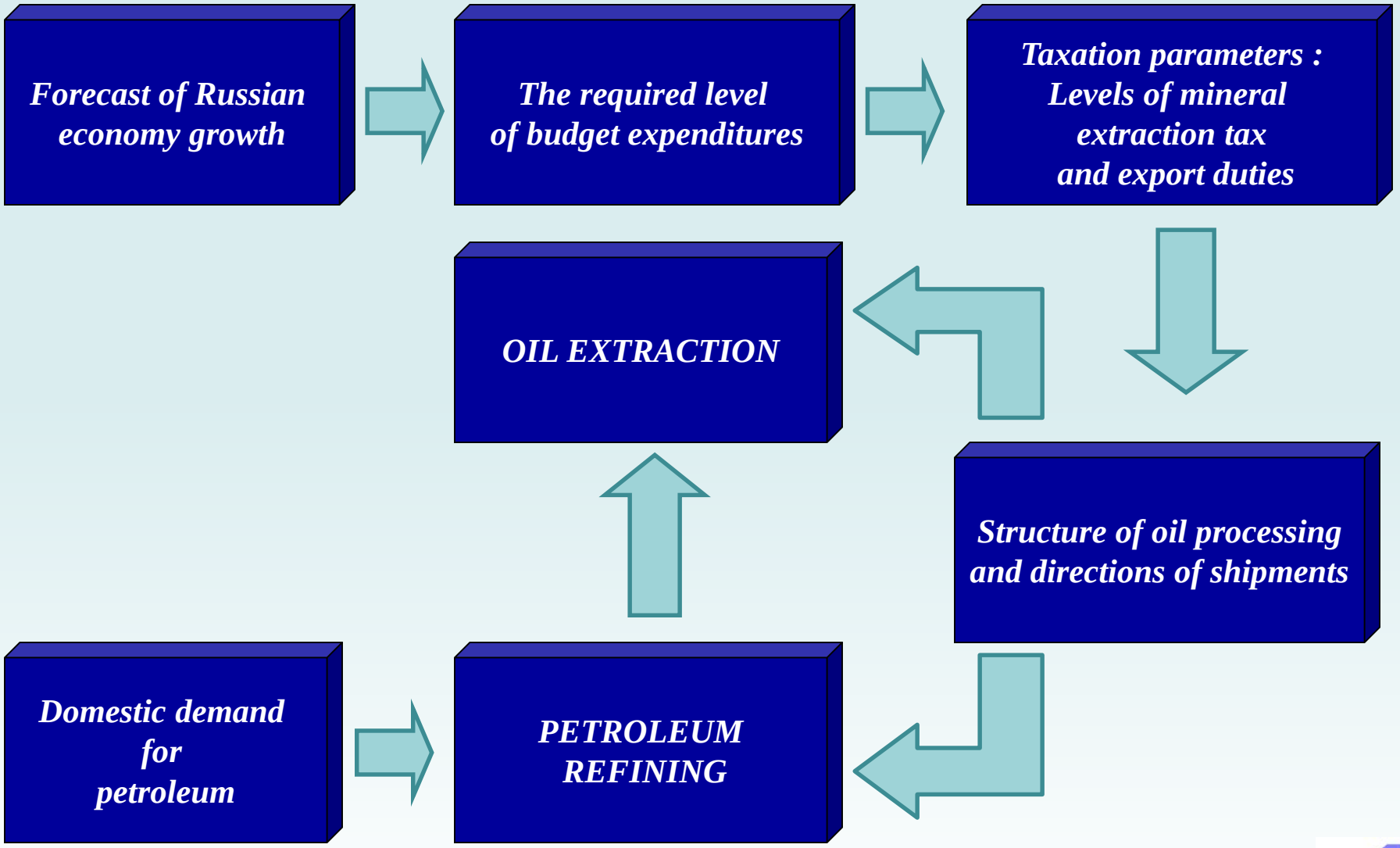
Energy sector of Russian economy

- Produces 14,2% of GDP
- Forms 66,5% of Russian exports (33% - oil,12,8% – natural gas, 20,7%-petroleum products)
- Makes 25,8% of total investments
- Provides 27,4% of government budget income
- Provides 4,5% of employment
- Has a high multiplier effect (1.65 on gross output, 1.05 on GDP,0.57 on budget income)

Russian Economy Model



Model of oil sector



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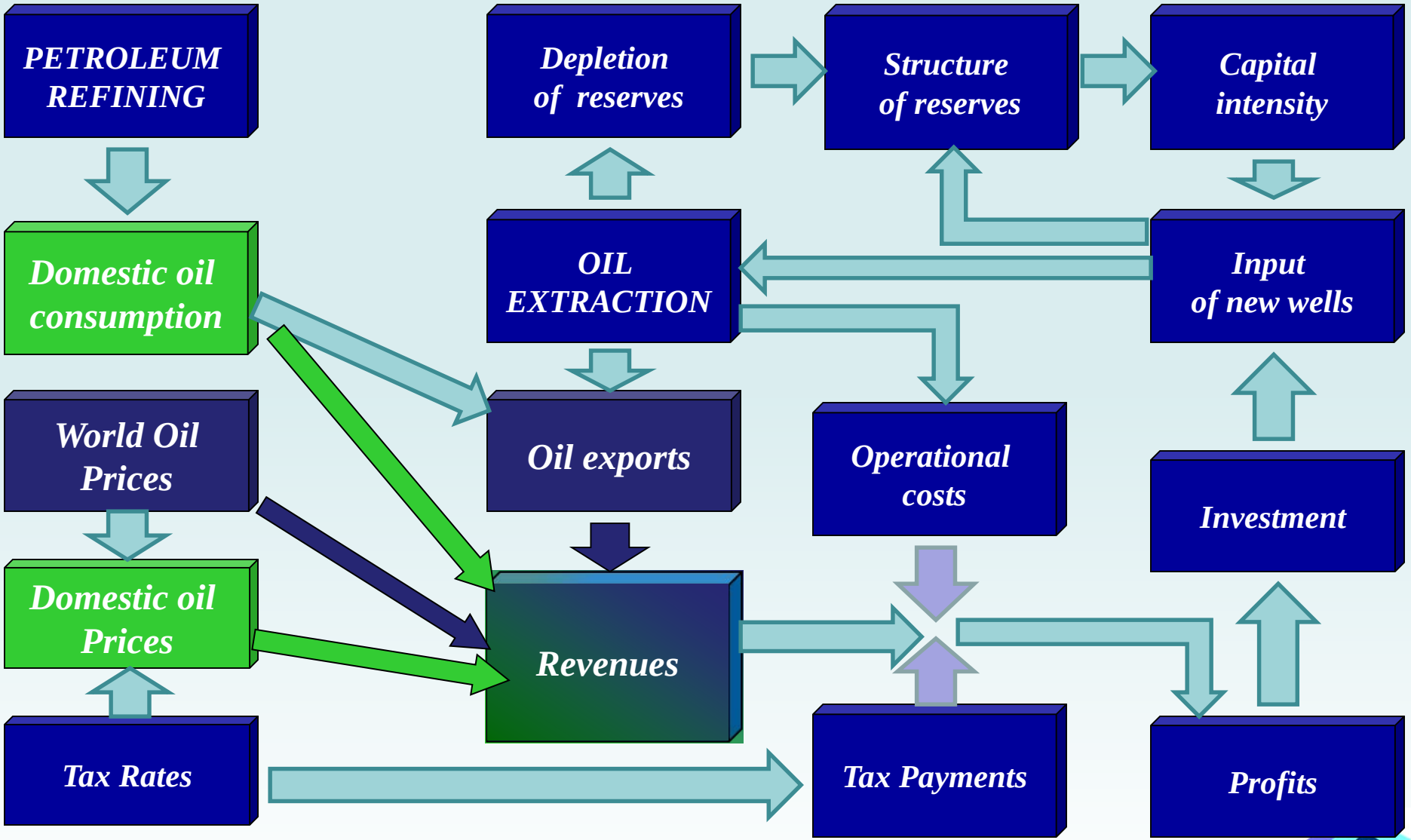
Model of oil sector



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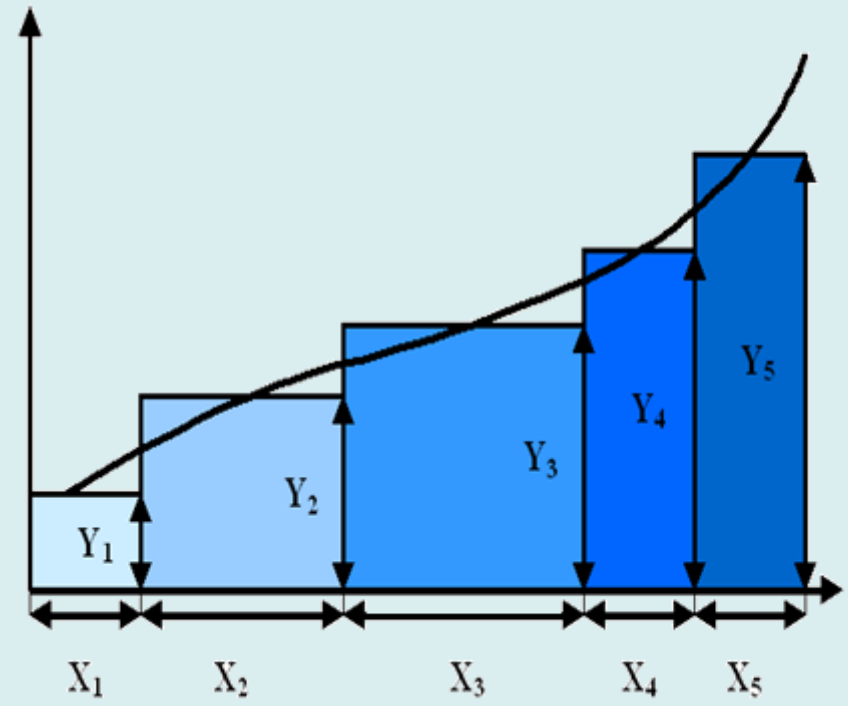
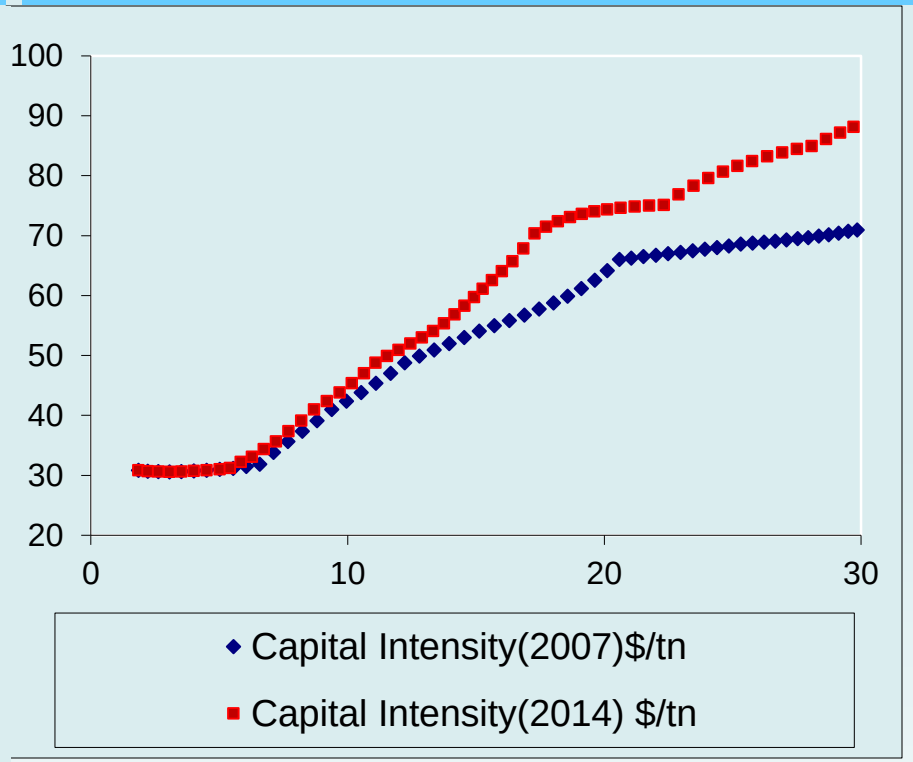
Forecast of capital intensity in oil sector

The methodolody of Capital intensity curve composition



Capital intensity estimation in 2007 and 2014, in $(2007)/tonn



More rapid growth of oil extraction led to faster increase in capital intensity. On the other side low rate of implementation of the new technologies has led to an additional increase in capital expenditures for the development of the most complex, in particular offshore, oil fields

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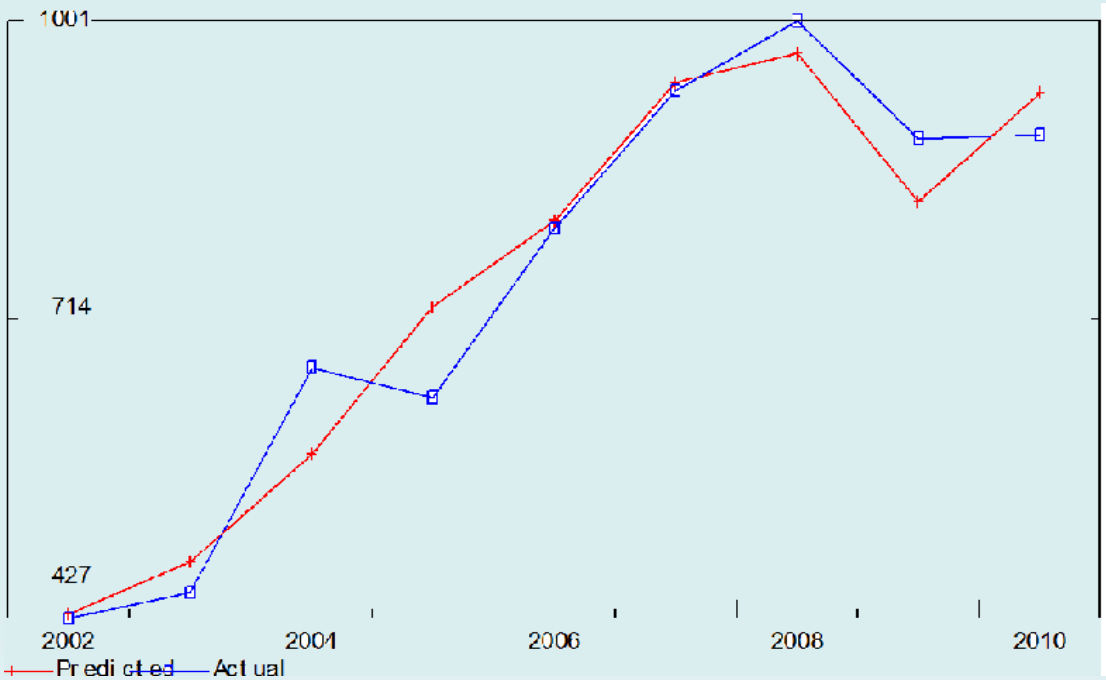
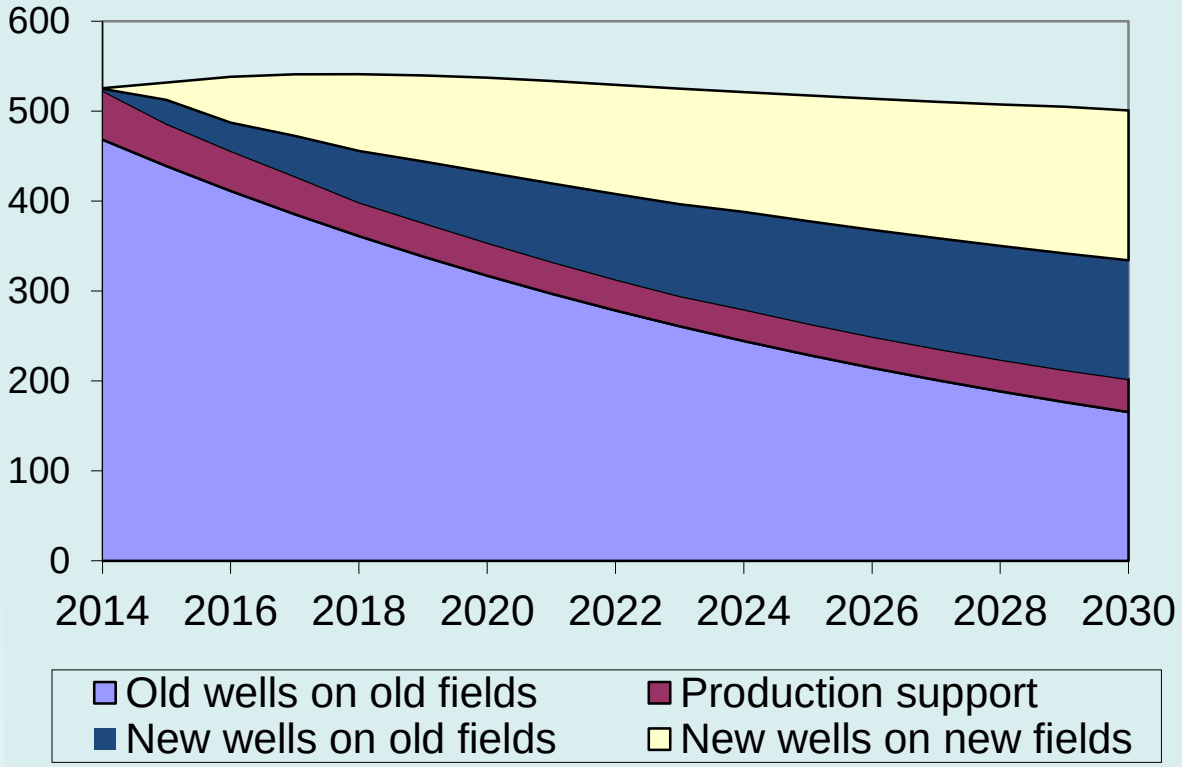
Investment in oil sector (RIM Model)



Investment in oil sector depends more on current financial results (rouble cost of oil barrel and gross profits), rather than on the accumulated size of credit debt

r capinv2 = credloanjur2/def, brent*rateusdm,prof_2

Variable name	Reg-Coef	Mexval	Elas	NorRes	Mean	Beta
0 capinv2	- - - - - - - - - - - - - - - - -			744.19	- - -	
1 intercept	230.26458	64.5	0.31	16.12	1.00	
2 credloanjur2/def	-213.44379	44.1	-0.10	12.14	0.35	-0.532
3 brent*rateusdm	0.22211	50.7	0.49	1.74	1639.73	0.650
4 prof_2	0.46230	32.0	0.30	1.00	483.78	0.714

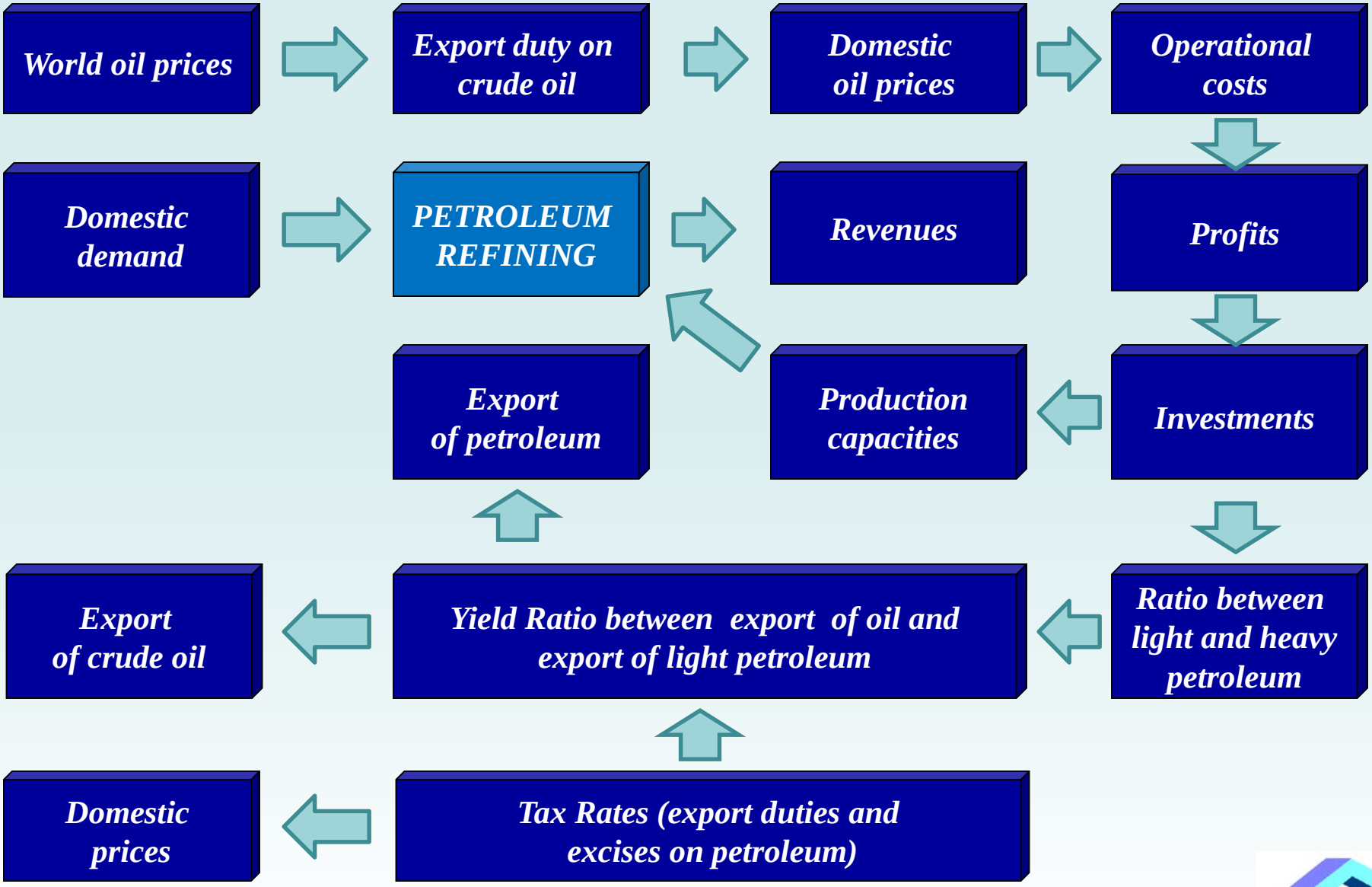


Oil extraction depends on support of production on the old, already developed fields and input in operation of the new fields.

Total amount of oil extraction is divided into following categories: output of the old wells, output from production support, output of the new wells on old fields and new wells on new field.

About half of all extracted oil in 2030 will be produced on the new fields (put in operation after year 2014)

Model of petroleum refining



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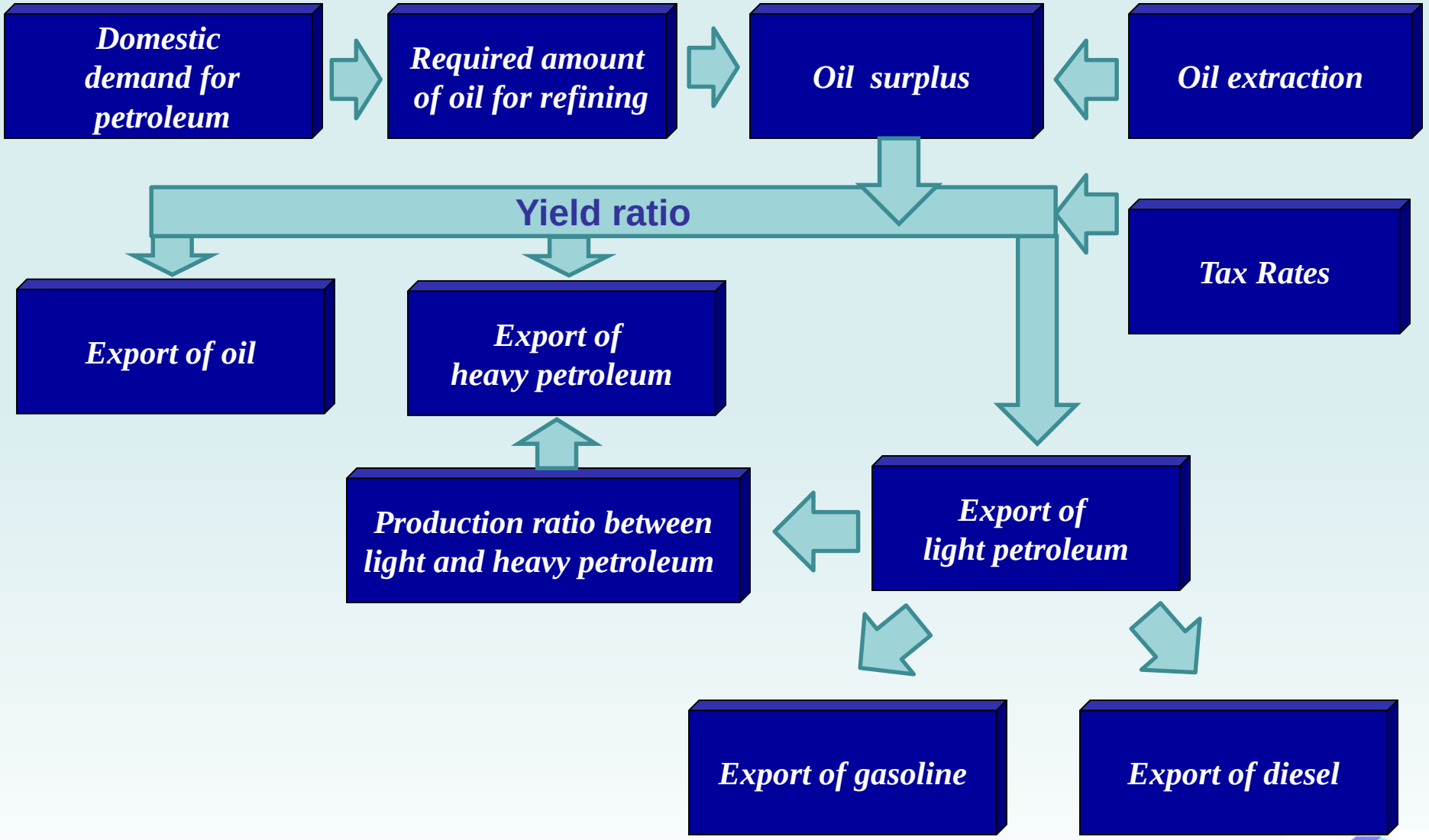
$$Eff\_inc = ShareLight * IncLight + (1 - ShareLight) * IncMazut$$

Oil distribution



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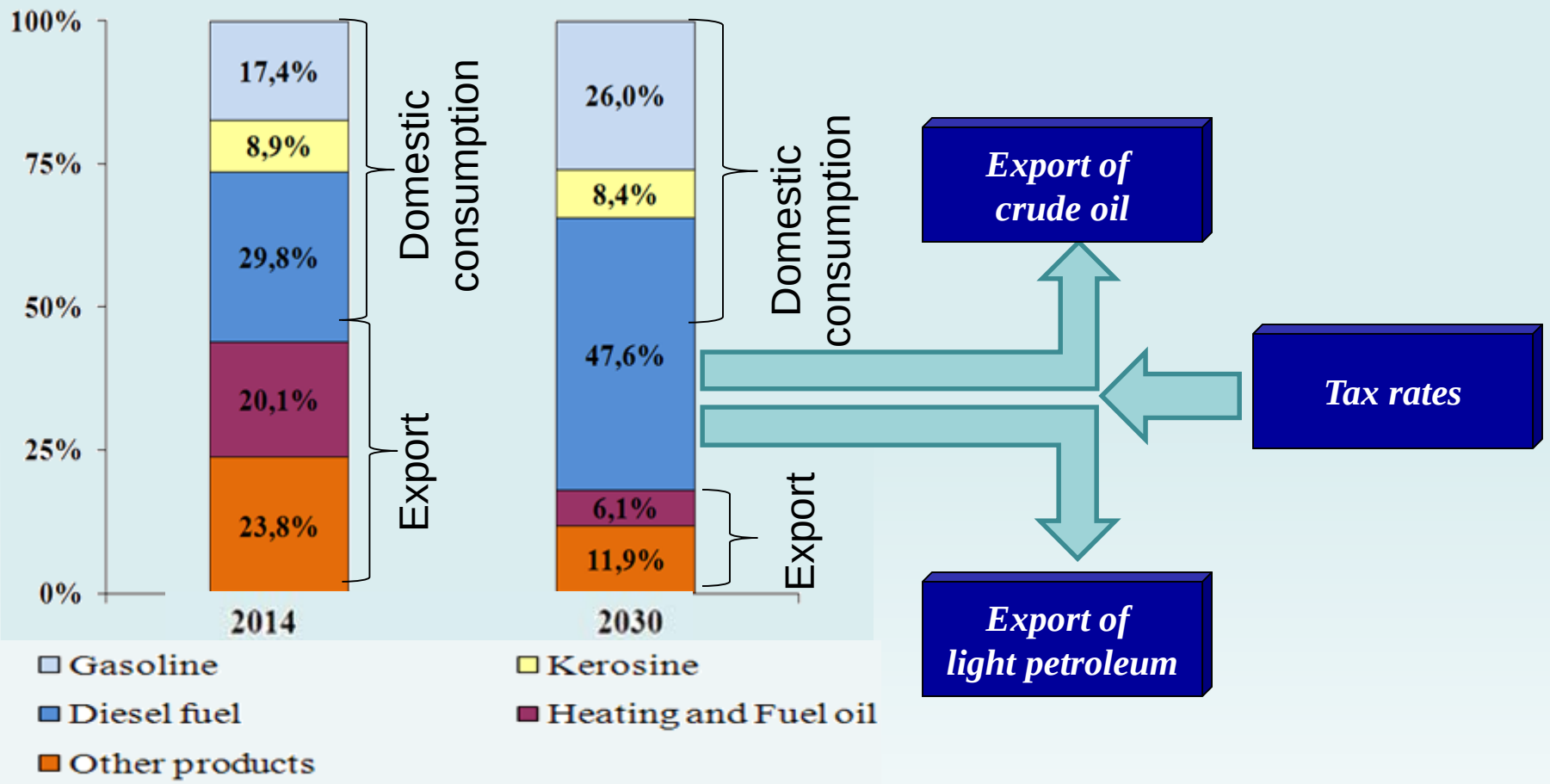
Current and expected structure of Russian petroleum refining



Currently, heavy petroleum products form about 70% of petroleum export. Due to increasing the depth of oil refining in 2030 production of heavy petroleum will decline. This will create a choice between export of crude oil and export light petroleum products

Population income index → **Number of passenger cars** → **HOUSEHOLDS DEMAND**

Retail trade turnover index → **BUSINESS DEMAND**

Number of trucks and freight cars → **BUSINESS DEMAND**

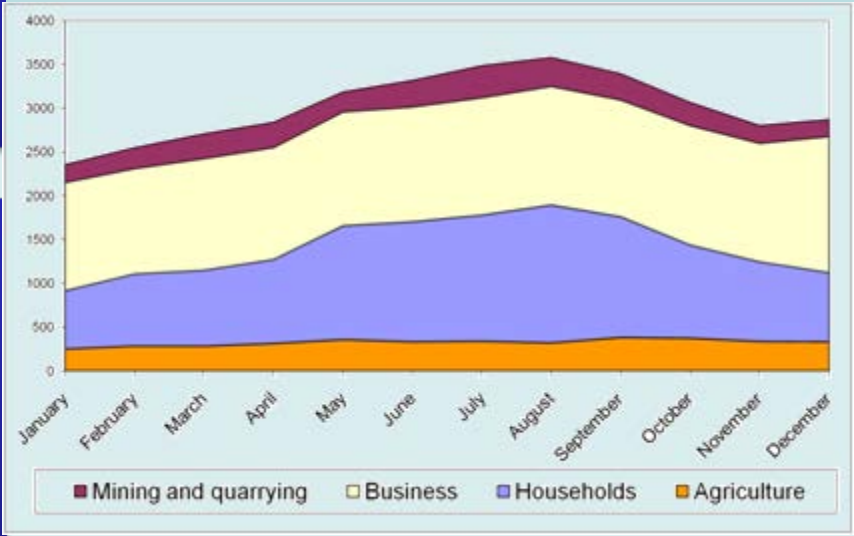
Industrial Production Index → **BUSINESS DEMAND**

Agricultural production index → **AGRICULTURE DEMAND**

Index of production in mining → **DEMAND OF QUARRY VEHICLES**

Index of construction → **DEMAND OF QUARRY VEHICLES**

Decomposition of the demand for petroleum



The main results of model calculations is the forecast of different consumers demand for gasoline and diesel fuel. Model provides forecast for Russian Federation as well as for Federal Districts and particular regions

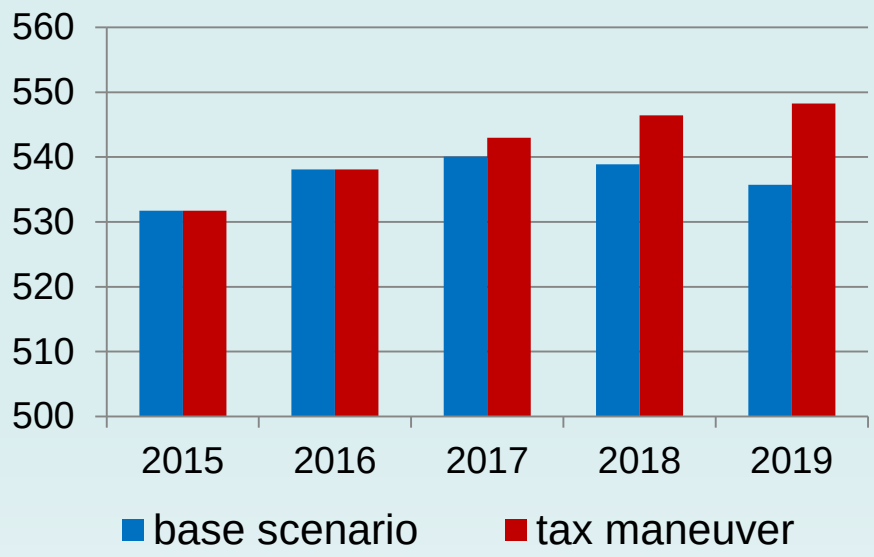
Influence of oil sector on Russian economy

Oil extraction in 2030, mln tonn	420	-20%	525	0%	630	20%
	2030/ 2013	Average growth rates	2030/ 2013	Average growth rates	2030/ 2013	Average growth rates
Gross output	**150%**	**2,4%**	**157%**	**2,7%**	**164%**	**3,0%**
Manufacture	139%	2,0%	149%	2,4%	158%	2,7%
Construction	178%	3,5%	185%	3,7%	192%	3,9%
Transport	195%	4,0%	202%	4,2%	209%	4,4%
Services	227%	4,9%	237%	5,2%	247%	5,5%
GDP	**164%**	**2,9%**	**173%**	**3,3%**	**181%**	**3,5%**
Household consumption	179%	3,5%	187%	3,8%	196%	4,0%
Government expenditures	116%	0,9%	119%	1,0%	121%	1,1%
Investment	187%	3,8%	198%	4,1%	208%	4,4%
Exports	141%	2,0%	152%	2,5%	161%	2,8%
Imports	156%	2,6%	162%	2,9%	168%	3,1%

Influence of oil sector on Russian economy

Oil extraction in 2030, mln tonn	420	-20%	472,5	-10%	630	20%
	2030 к 2013	Average growth rates	2030 к 2013	Average growth rates	2030 к 2013	Average growth rates
Gross output	**-7,5%**	**-0,3%**	**-3,8%**	**-0,1%**	**7,0%**	**0,3%**
Manufacture	-10,0%	-0,4%	-5,1%	-0,2%	8,8%	0,3%
Construction	-6,9%	-0,2%	-3,5%	-0,1%	6,8%	0,2%
Transport	-7,3%	-0,2%	-3,7%	-0,1%	7,1%	0,2%
Services	-10,0%	-0,3%	-5,0%	-0,1%	10,3%	0,3%
GDP	**-9,0%**	**-0,3%**	**-4,6%**	**-0,2%**	**8,2%**	**0,3%**
Household consumption	-8,1%	-0,3%	-4,1%	-0,1%	8,4%	0,3%
Government expenditures	-3,0%	-0,2%	-1,5%	-0,1%	2,6%	0,1%
Investment	-10,2%	-0,3%	-5,2%	-0,2%	10,1%	0,3%
Exports	-11,1%	-0,5%	-5,7%	-0,2%	8,7%	0,3%
Imports	-6,1%	-0,2%	-3,1%	-0,1%	6,3%	0,2%

Oil extraction, mln. tonn



Tax maneuver consists of:

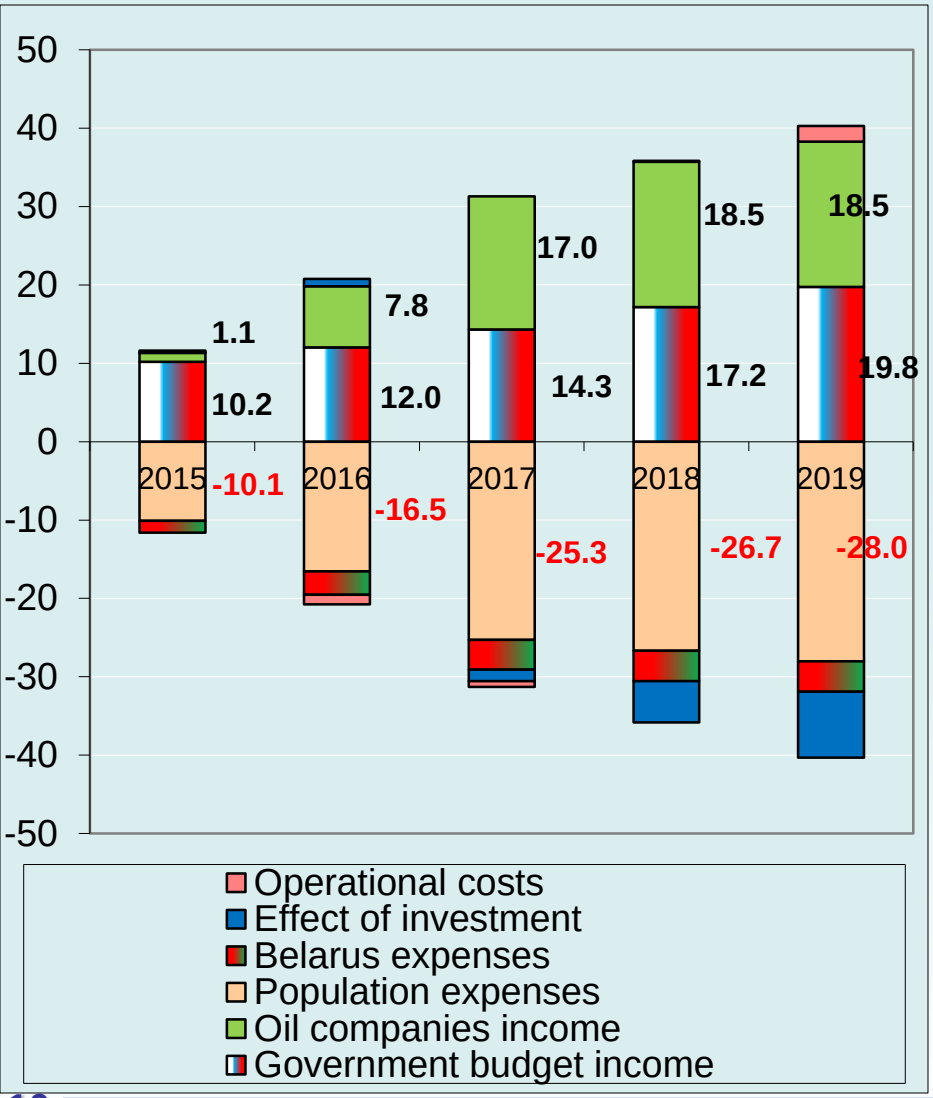
- ❑Increase of mineral extraction tax by 1.6 times
- ❑Reduction of export duties on
  - oil from 60% to 30%,
  - gasoline from 90% to 30%,
  - diesel from 65% to 30%
- ❑50% reduction of excises on light petroleum

Tax maneuver may result in:

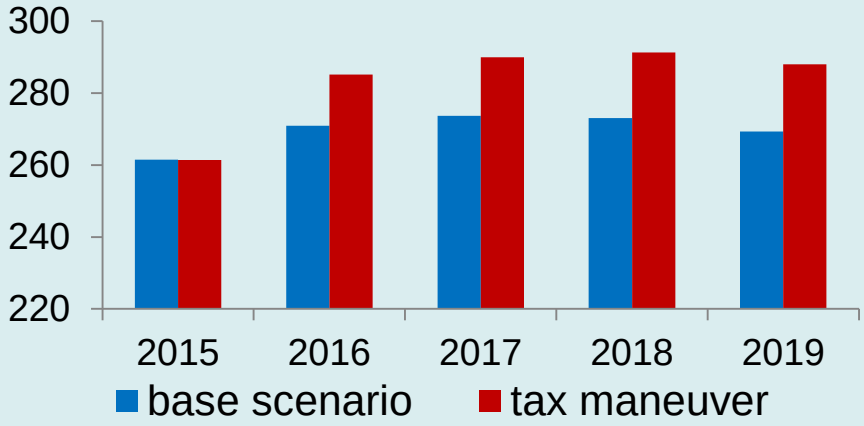
- ❑Growth of domestic prices on petroleum up to 10%
- ❑Increase of CPI by 0,5 percentage point
- ❑Possible decline of GDP growth rates in 2015-2016 by 0,2 percentage point
- ❑Significant degrease in amount of petroleum refining in favor of crude oil exports
- ❑Improvement of petroleum refining structure due to disposal facilities with a high proportion of heavy petroleum products

Tax maneuver in conditions of high oil prices(120$/br)

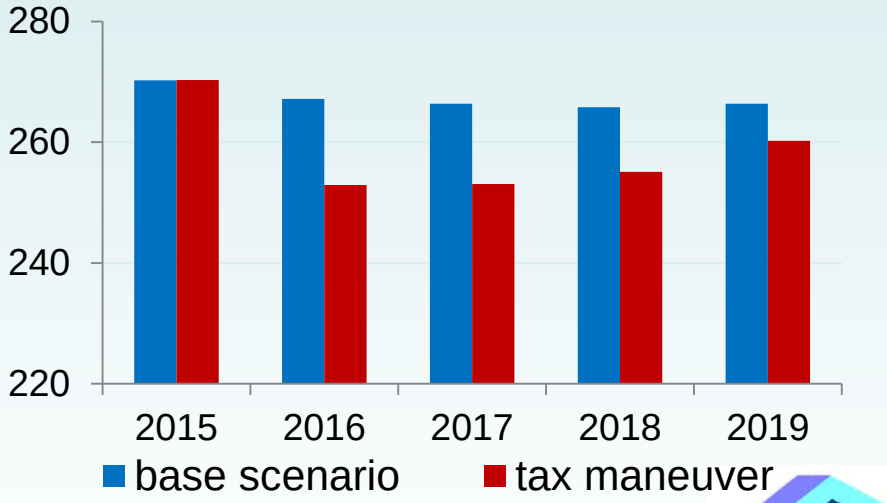
Cash flow distribution, bln $



Oil export, mln. tonn



Petroleum refining, mln. tonn



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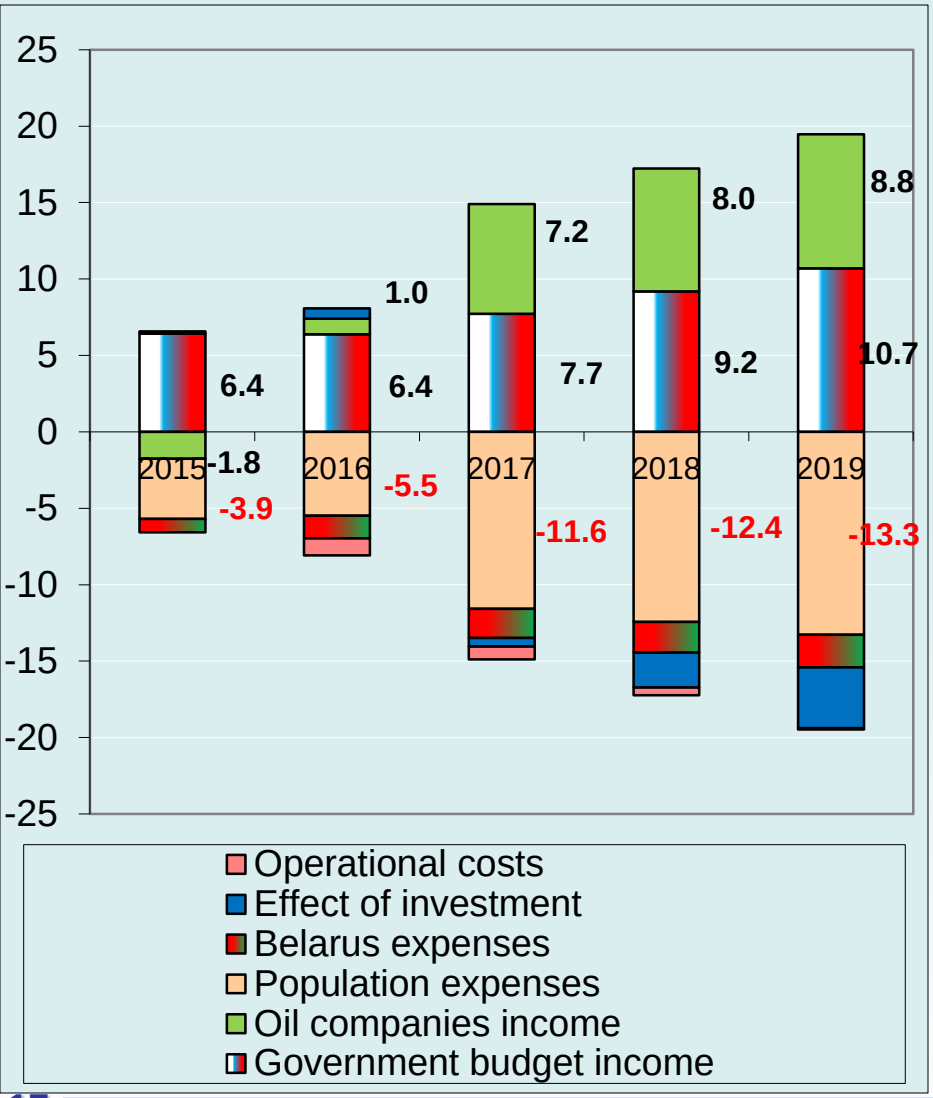
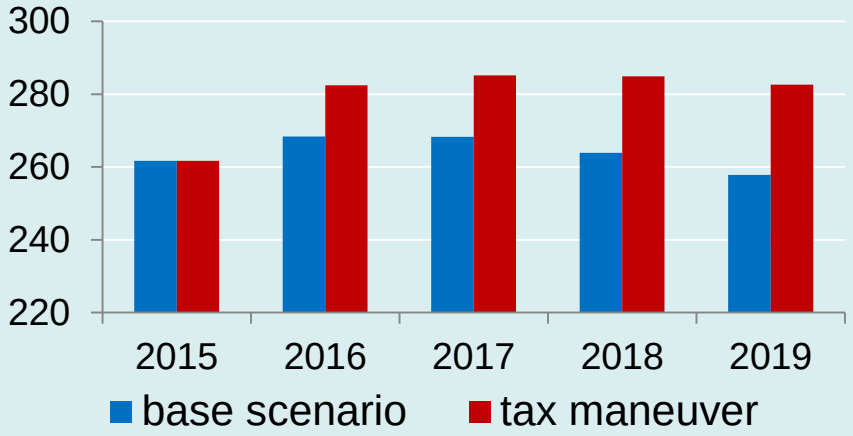
Tax maneuver in conditions of high oil prices(80$/br)

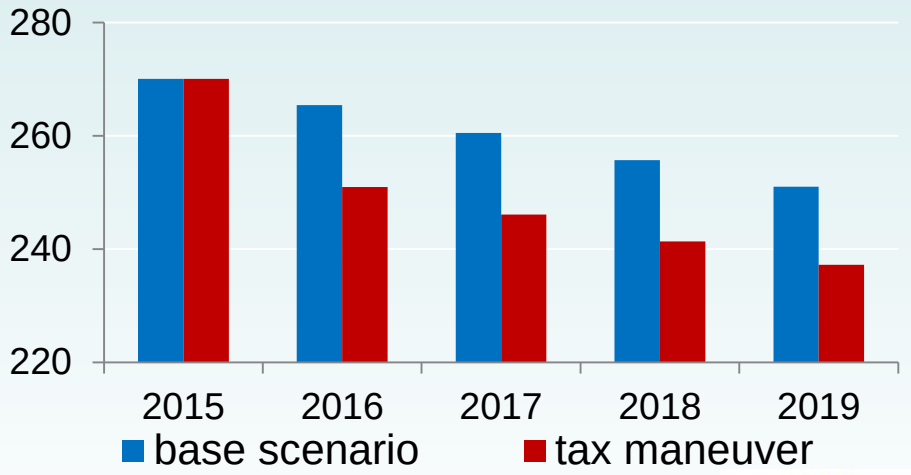
Cash flow distribution, bln $



Oil export, mln. tonn



Petroleum refining, mln. tonn



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THANK YOU

FOR YOU ATTENTION

Appendix: Model complex