



INSTITUTE OF ECONOMIC FORECASTING  
RUSSIAN ACADEMY OF SCIENCES



## THE INSTITUTIONAL ACCOUNTS: APPLYING IN RUSSIAN INTERINDUSTRY MODEL

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## 2 Current progress in RIM

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- **Updating of I-O tables**

In 2017-2018 Russian Federal State Statistics Service published new I-O tables for 2011-2015. “New tables” means new classification and methodology. So this year we have renewed I-O tables being used in RIM model. My colleagues from the Institute managed to calculate I-O tables in constant prices for 2011-2015. Now our task is to incorporate the I-O tables in the model. It’s a great work and it’s not finished yet.

- **PADS (Perhaps Adequate Demand System) for personal consumption**

PADS were embedded in RIM. The results were presented on the INFORUM Conference in Riga in last year

- **Baseline scenario**

Baseline scenario was built in framework of PortableDyme. The alternative scenarios are going to be made



### 3 Institutional Accounts Applying: Motivation

- GDP growth rates **don't exceed 2% per year** since the crisis of 2014. One of the main goal of economic policy is to activate economic growth
- The strict budgetary policy: **no significant increase of expenditures** even upon growth of budget incomes, focusing only on deficit-free budget
- The Government operates with sufficient financial resources to expand budget policy list of tasks and to include measures to accelerate economic growth: budget revenues exceeded 33% to GDP in 2017
- It's necessary to use the whole range of modeling tools to estimate the budget policy effects (not only Treasury reports in terms of “revenues-expenditures-deficit”).  
**Institutional Accounts are such kind of tool**



## 4 Institutional accounts: advantages and disadvantages

**“Institutional Accounts provide a complete picture of payments among**

- (1) enterprises,**
- (2) financial institutions,**
- (3) governments,**
- (4) households,**
- (5) the rest of the world.**

**They begin from the value added by each institution and then show how – by payments of wages, social security contributions, taxes, dividends, interest, and transfers – that value-added changes hands and becomes the income of households and governments.”**

*The Craft of Economic Modeling, part 2, chapter 13*

### Advantages of Institutional Accounts applying:

- long data sets are available: 1995-2016,
- include budget and extra-budget operations for Governments sector,
- fully consistent with other accounts of SNA,
- include transfers in kind from Governments to Households

### Disadvantages:

- Published with delay of 2 years,
- brief comments of Federal State Statistics Service are inadequate for understanding how they work



## Estimation of Institutional Accounts (“Governments” Institution) using the information on budget’s execution for 2017 – slide 1

	<i>Institutional Accounts</i>		<i>Budget and Interindustry Indicators</i>
1	<b>Gross value-added</b>	→	va(41) + va(42) + va(43)
2	Wages	→	wages(41) + wages(42) + wages(43)
3	Net taxes on production paid		not estimated
4	Net taxes on production received	→	property tax
5	Taxes on products received	→	VAT + excises + export and import duties
6	<b>Gross primary income</b>	=	1 + 2 + 3 + 4 + 5
7	Using-up of fixed capital		not estimated
8	<b>Net Primary Income</b>	=	6 + 7
9	Property incomes paid	→	expenditures for state and municipal debt service
10	Property incomes received	→	revenues from state and municipal property + regular payments for natural resources usage
11	<b>Net Institutional Income</b>	=	8 + 9 + 10

\*va (41) – value-added of Education sector, va(42) – value-added of Public Health sector, va(43) – value-added of Government sector from OKVED interindustry balances; similarly for the “wages” parameters.



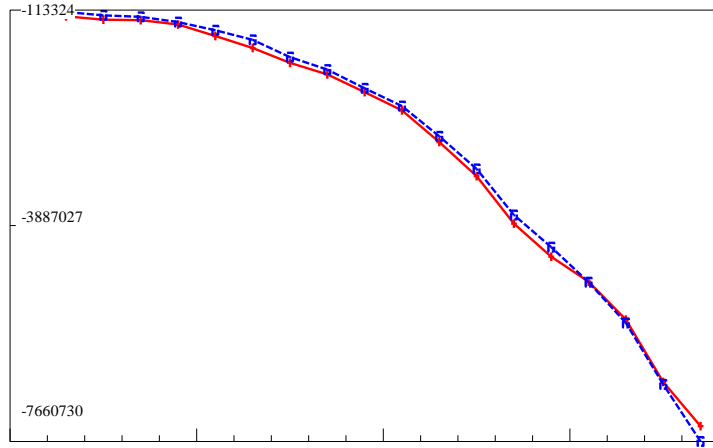
## Estimation of Institutional Accounts (“Governments” Institution) using the information on budget’s execution for 2017 – slide 2

	<i>Institutional Accounts</i>		<i>Budget and Interindustry Indicators</i>
12	Income and Property Taxes	→	company profit tax + personal income tax + aggregate income tax
13	Payments to Social Security	→	social insurance contributions
13	Social benefits	→	expenditures for social policy + financing of pensions
15	Other current transfers paid		not estimated
16	Other current transfers received		not estimated
17	<b>Net Disposable Income</b>	=	11 + 12 + 13 + 14 + 15 + 16
18	Government Purchases	→	budget expenditures – transfers – interest expenditures
19	<b>Net Saving</b>	=	17 + 18
20	<b>Gross Saving</b>	=	17 - 7
21	Transfers in kind to households	→	budget expenditures for education, public health and other personal services

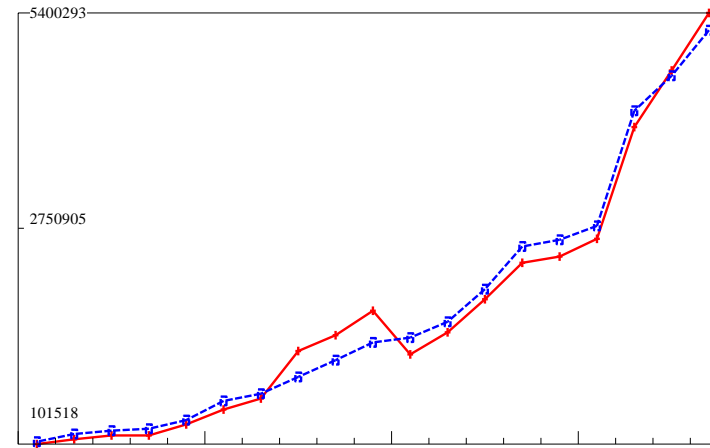


# Estimation of Institutional Accounts (“Governments” Institution) using the information on budget’s execution in G7 - results

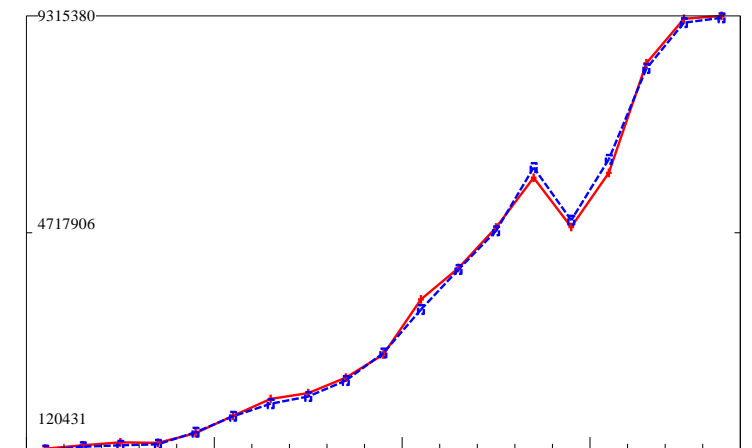
Wages (paid by government)



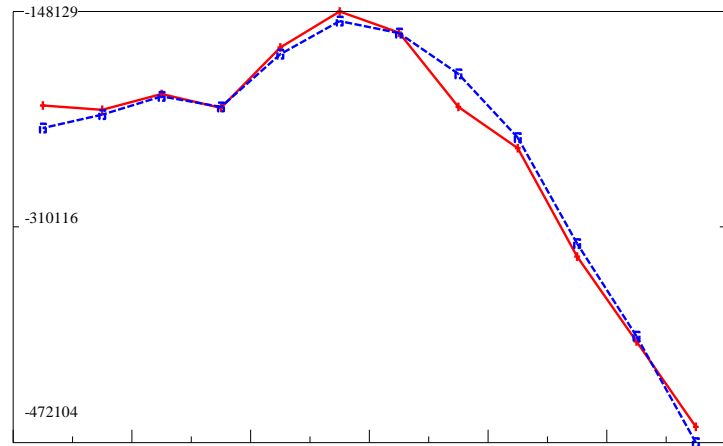
Payment to social security



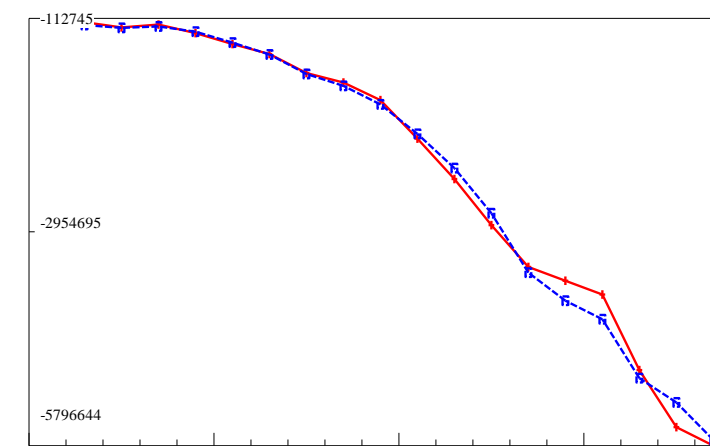
Taxes on products (received from other institutes)



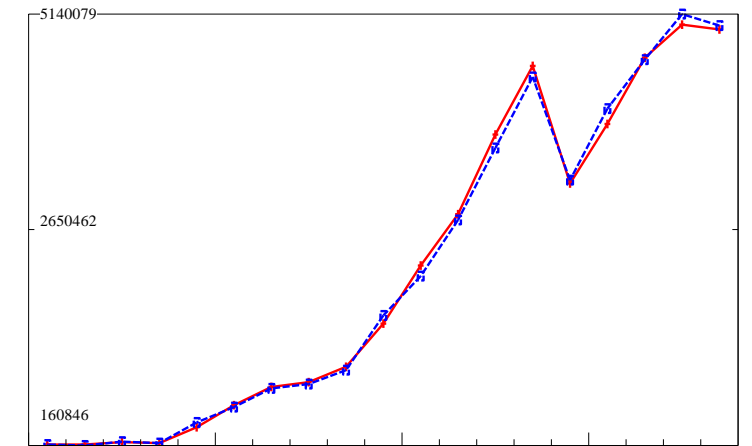
Income from properties (paid)



Transfers in kind



Taxes on income



— Predicted — Actual

— Predicted — Actual

— Predicted — Actual



## 8 Source and Use of funds for “Governments” Institution (% to the total)

	<i>1995</i>	<i>2000</i>	<i>2005</i>	<i>2010</i>	<i>2016</i>
<b>Sources, including:</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Gross Value Added	25	16	19	24	30
including gross profit	8	1	1	1	7
Net taxes and social contributions	75	78	79	74	60
Net property incomes	-1	-3	1	2	10
Others	<b>1</b>	9	1	0	0
<b>Use, including:</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Wages	18	18	21	22	21
Social Benefits	20	20	19	23	22
Transfers in kind	23	15	19	19	16
Government purchases	24	28	23	21	22
Investment	14	15	18	11	13
Others	1	4	0	4	6
<b>Savings (% to total sources)</b>	<b>-1</b>	<b>22</b>	<b>13</b>	<b>-3</b>	<b>-4</b>





## 9 Indicators of production and use of gross value added for Education and Public Health in 2015

	Education		Public Health	
	Budget entities	Private entities	Budget entities	Private entities
Intermediate consumption to gross output ratio	0.19	0.39	0.34	0.48
Wages to gross output ratio	0.76	0.44	0.64	0.37
Gross profit to gross output ratio	0.03	0.17	0.01	0.15
Gross profit to intermediate consumption ratio	0.15	0.45	0.04	0.32
Wages per employee, rub./month	26700	59100	51700	30000

For the output of 1 Rouble, the public sector will expend **1.5-2 times less** intermediate expenditures (see Line 1).

The average level of expenditures per one employee in state educational institution is **twice lower** than in commercial segment, whereas the situation with healthcare is absolutely the opposite (see the last line).

Thus, both educational and medical budget organizations have the opportunity to get a win against commercial enterprises due to a lower level of intermediate consumption, and less unit labor costs is an additional advantage for educational services

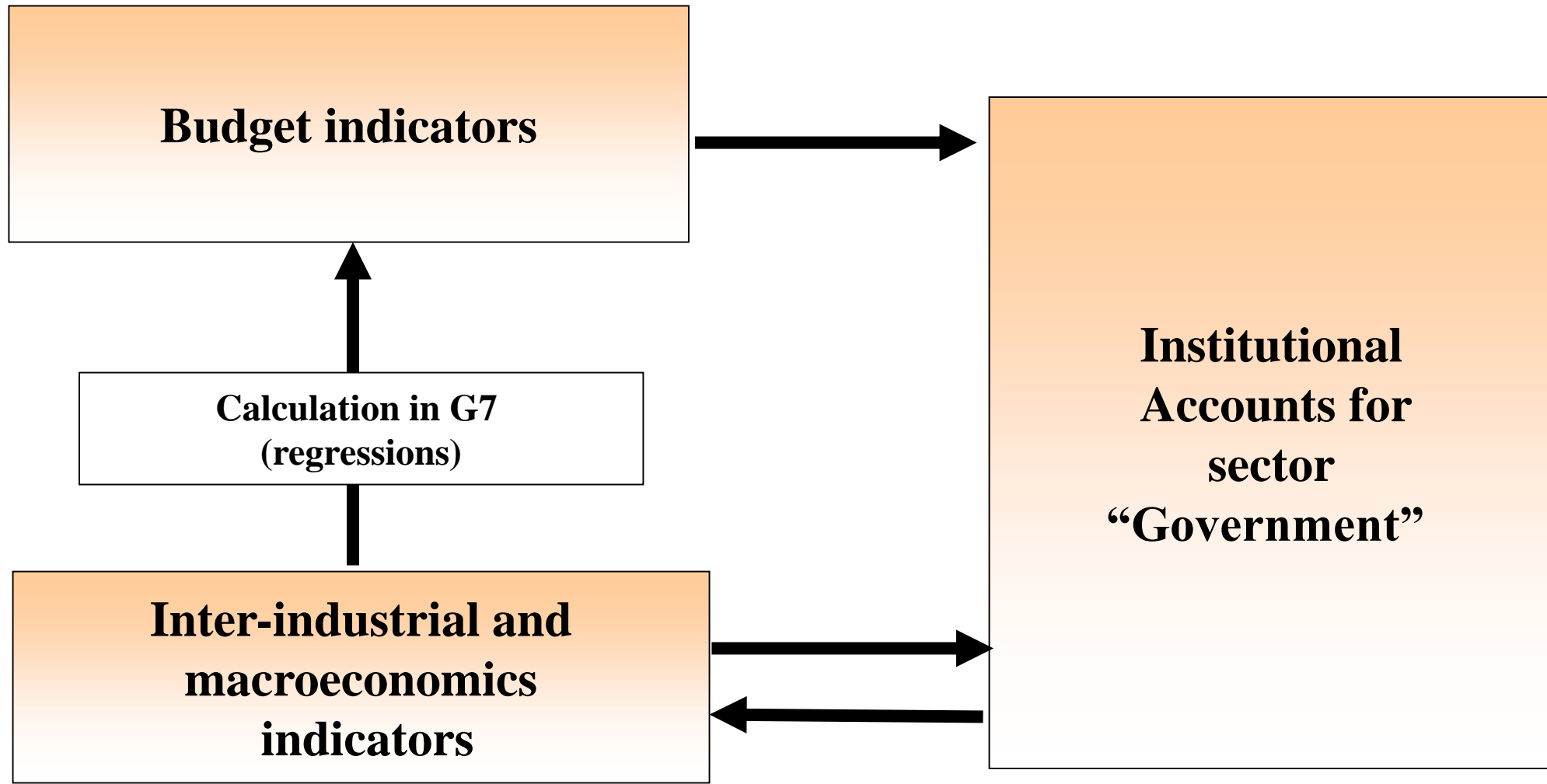


## 10 Flows of income redistribution with participation of “Governments” Institution

<b>Flows, trln. rubles (in brackets - % to the previous year)</b>	2010	2015	2016	2017 (estimation)
Taxes (from business to government)	8.1 (+33%)	8.4 (-7%)	8.7 (+4%)	8.8 (+2%)
Payments to social security and other payments (from business to government)	2.8 (+7%)	6.0 (+9%)	6.4 (+7%)	6.8 (+5%)
Taxes (from households to government)	2.5 (+10%)	4.5 (+0%)	4.7 (+6%)	5.0 (+6%)
Wages (from government to households)	5.0 (+14%)	8.6 (+2%)	8.9 (+3%)	9.8 (+10%)
Social benefits (from government to households)	5.0 (+37%)	7.5 (-2%)	8.9 (+14%)	9.4 (+9%)
<b>Transfers in kind (from government to households)</b>	<b>4.3 (+6)</b>	<b>6.8 (+4%)</b>	<b>7.0 (+4%)</b>	<b>6.5 (-7%)</b>
<b>Balance of interactions between government and business</b>	<b>10.9 (+25%)</b>	<b>14.4 (-1%)</b>	<b>15.1 (+5%)</b>	<b>15.6 (+3%)</b>
<b>Balance of interactions between government and households</b>	<b>-11.9 (+20%)</b>	<b>-18.5 (+2%)</b>	<b>19.7 (+7%)</b>	<b>-20.6 (+4%)</b>
<b>CPI, %</b>	<b>+8.8%</b>	<b>+12.9%</b>	<b>+5.4%</b>	<b>+2.5%</b>



## 11 Embedding Institutional Accounts into Russian Interindustry Model (RIM)



## Embedding Institutional Accounts into Russian Interindustry Model (RIM) – Personal Consumption of Education services

### Education

SEE = 89.12 RSQ = 0.9462 RHO = 0.34 Obser = 16 from 1998.000  
 SEE+1 = 88.39 RBSQ = 0.9379 DW = 1.32 DoFree = 13 to 2013.000  
 MAPE = 6.25

Variable name	Reg-Coeff	Mexval	Elas	NorRes	Mean	Beta
0 pceRpc42	- - - - -	- - - - -	- - - - -	- - - - -	1335.29	- - -
1 rdpce42	850.49640	4.7	0.51	1.09	0.80	
2 wagall_pc	2.83818	4.3	0.44	1.05	209.22	0.362
3 trnatG	-0.00002	2.6	0.04	1.00	-2406660.44	-0.119

### Education

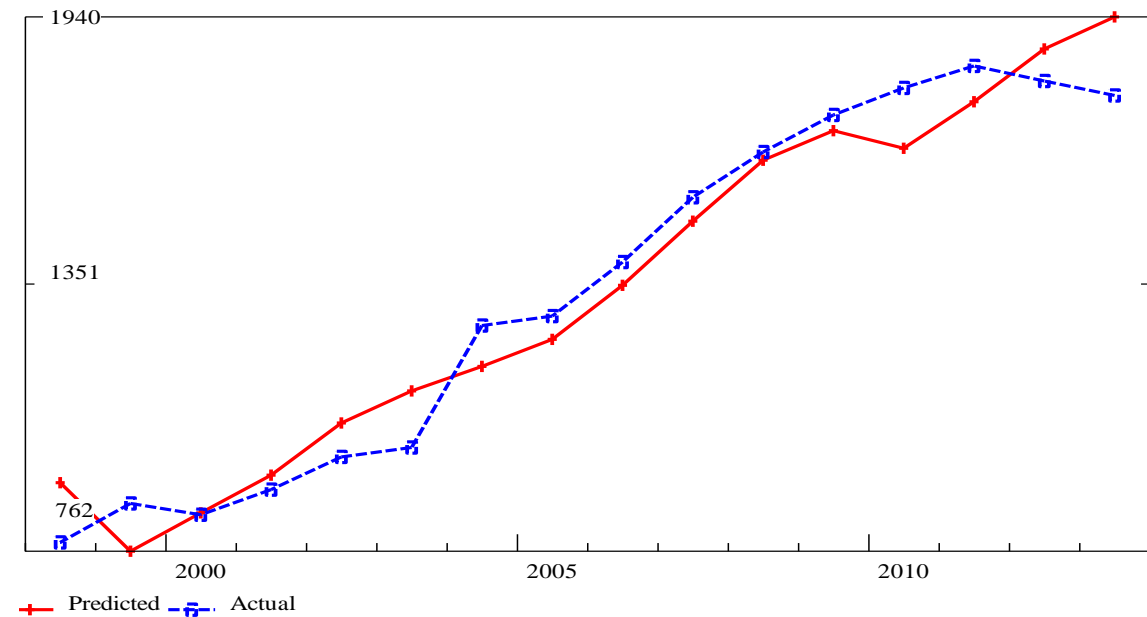
отребление домашними хоз

pceRpc42 – personal consumption of Education services per capita in constant prices

rdpce42 = dpce42/dpceT – sector price relative to PCE deflator

wagall\_pc – wages per employed in constant prices

trnatG – transfers from budget in kind



# Embedding Institutional Accounts into Russian Interindustry Model (RIM) – Personal Consumption of Public Health services

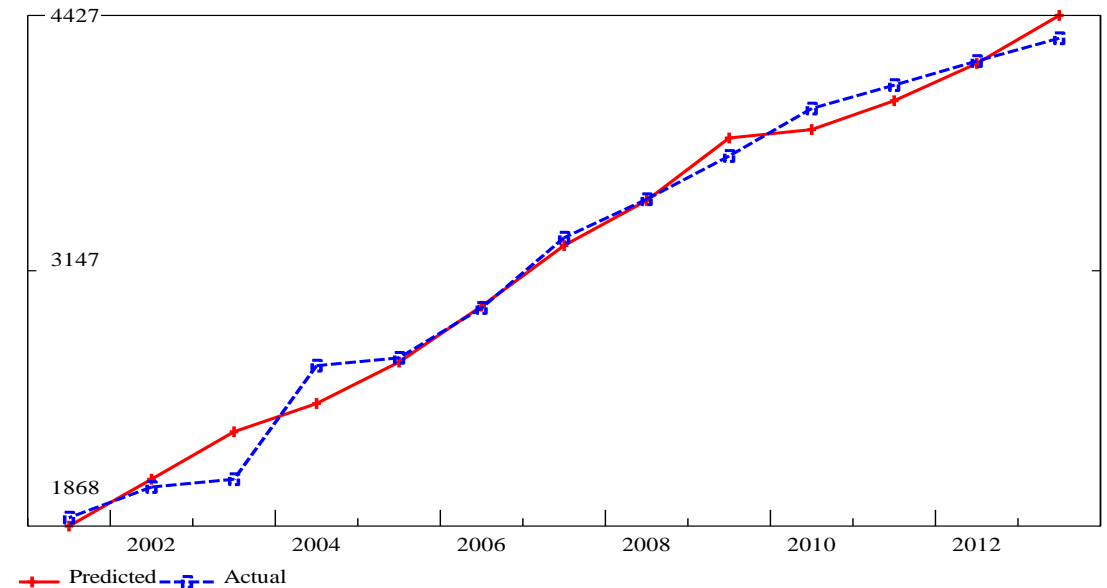
Public Health													
SEE	=	102.53	RSQ	=	0.9843	RHO	=	-0.21	Obser	=	13	from	2001.000
SEE+1	=	98.81	RBSQ	=	0.9811	DW	=	2.42	DoFree	=	10	to	2013.000
MAPE	=	2.68											
Variable name		Reg-Coeff	Mexval	Elas	NorRes	Mean	Beta						
0	pceRpc43	- - - - -	- - - - -	- - - - -	- - - - -	3191.53	- - -						
1	intercept	508.61363	10.2	0.16	63.64	1.00							
2	moneyincRpc	9.58247	59.0	0.59	4.05	194.85	0.418						
3	trnatG	-0.00028	101.3	0.26	1.00	-2888614.77	-0.591						

pceRpc43 – personal consumption of Public Health services per capita in constant prices

moneyincRpc – personal income per capita in constant prices

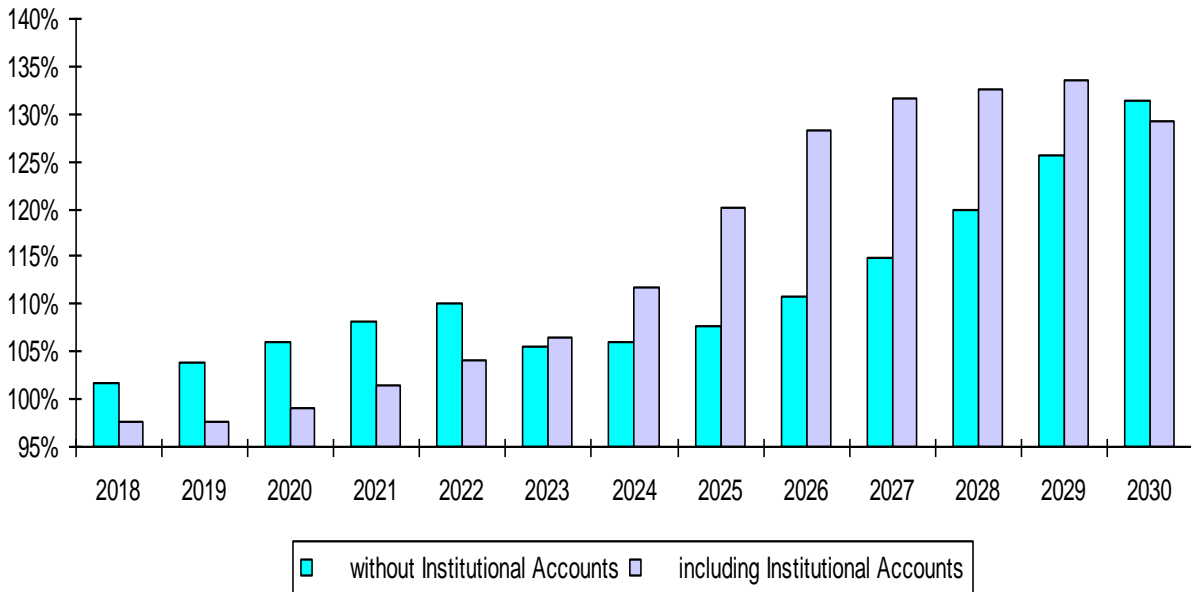
trnatG – transfers from budget in kind

Public Health  
отребление домашними хоз



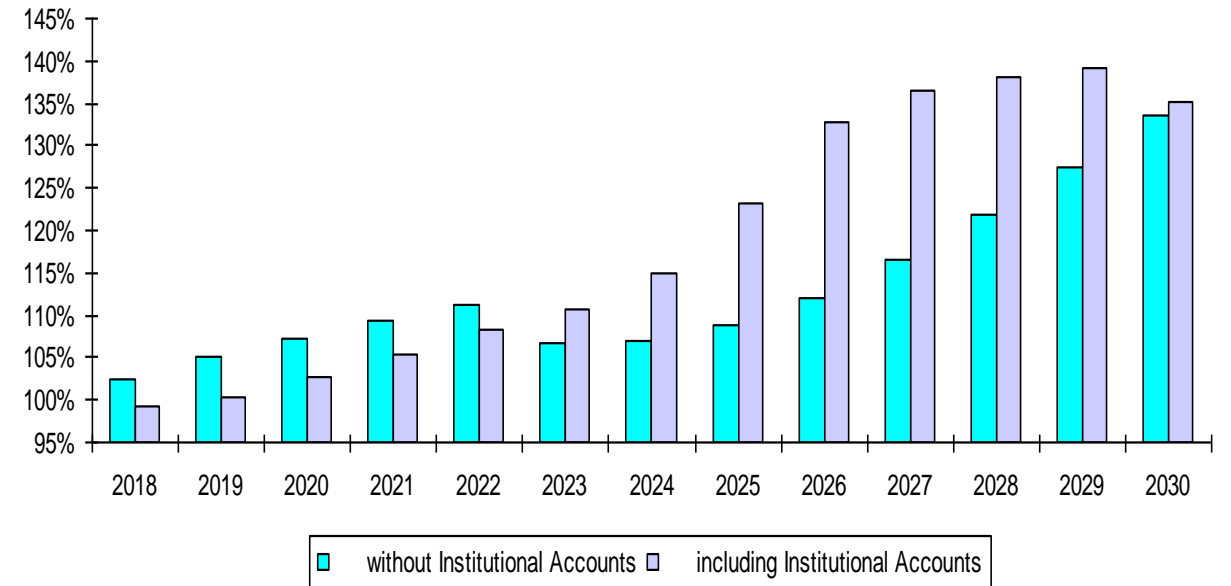
### Households consumption of Education services

in constant prices, % to level of 2017



### Households consumption of Public Health services

in constant prices, % to level of 2017



## 15 Conclusions

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1. The Institutional Accounts provide a useful additional tool for analysis and modeling of economic development. They cause positive results when studying the relationship between the government and the households.
2. In our point of view, unpopularity of the Institutional Accounts is associated primarily with a long delay in publishing of the reporting data. Concerning the accounts of "Government" sector, it is quite possible to make own estimation of the indicators using the available data from the Federal Treasury on consolidated budget execution.
3. The Institutional Accounts provide an opportunity to study all aspects of developing and using government resources, including extra-budgetary activity.
4. The use of indicators of the Institutional Accounts is able to enrich interindustry model, primarily in determining the level of household consumption considering not only income but also non-monetary ways of households support by the government.



Thank you!

