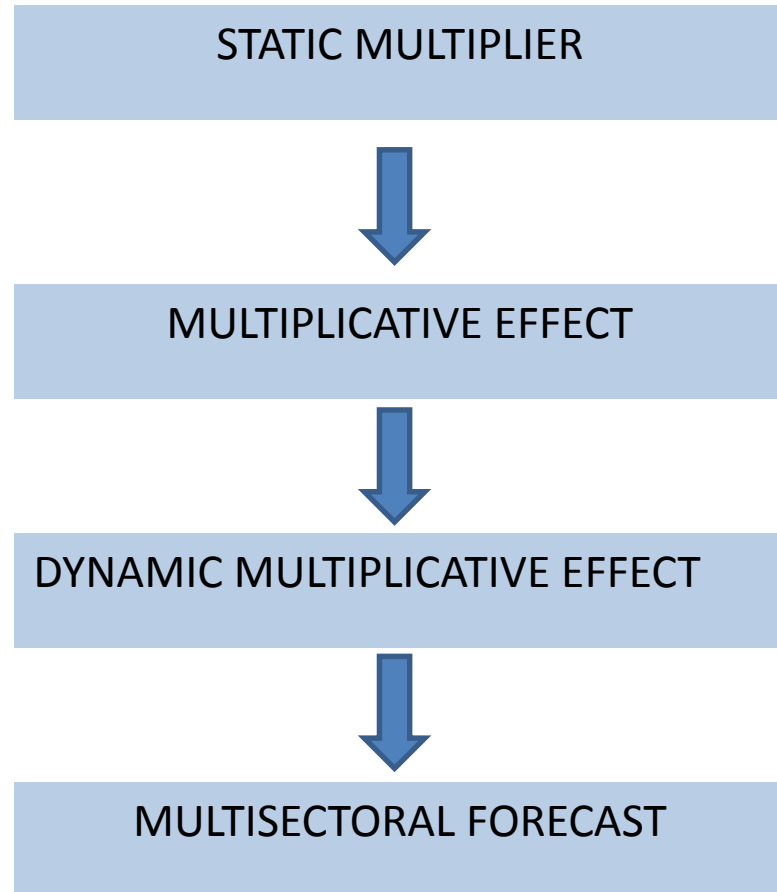INSTITUTE OF ECONOMIC FORECASTING
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ESTIMATION OF THE MULTIPLICATIVE EFFECTS OF THE INTERNATIONAL PROJECTS

XXV INFORUM WORLD CONFERENCE, RIGA

The calculation of multipliers in the system of economic forecasting

STATIC MULTIPLIER

↓

MULTIPLICATIVE EFFECT

↓

DYNAMIC MULTIPLICATIVE EFFECT

↓

MULTISECTORAL FORECAST

- Calculation of multipliers can be considered as the first stage of analysis

- For a final answer, we need a classical macroeconomic, multisectoral forecast
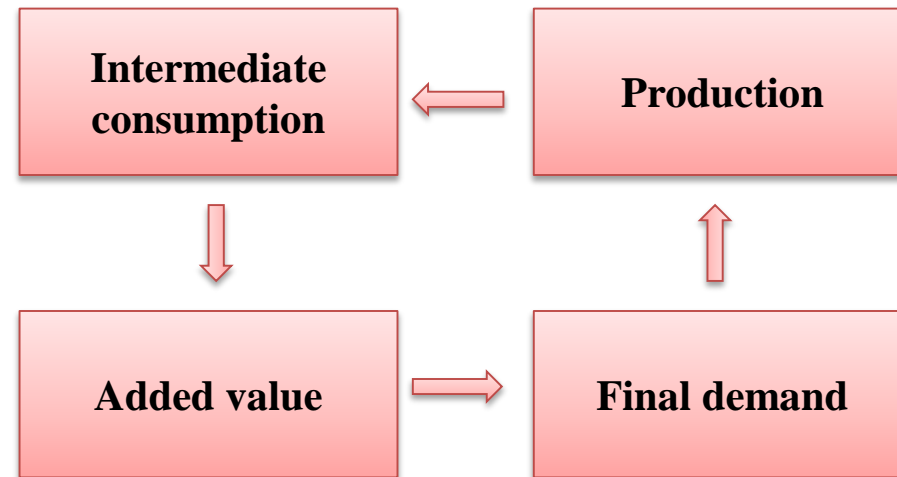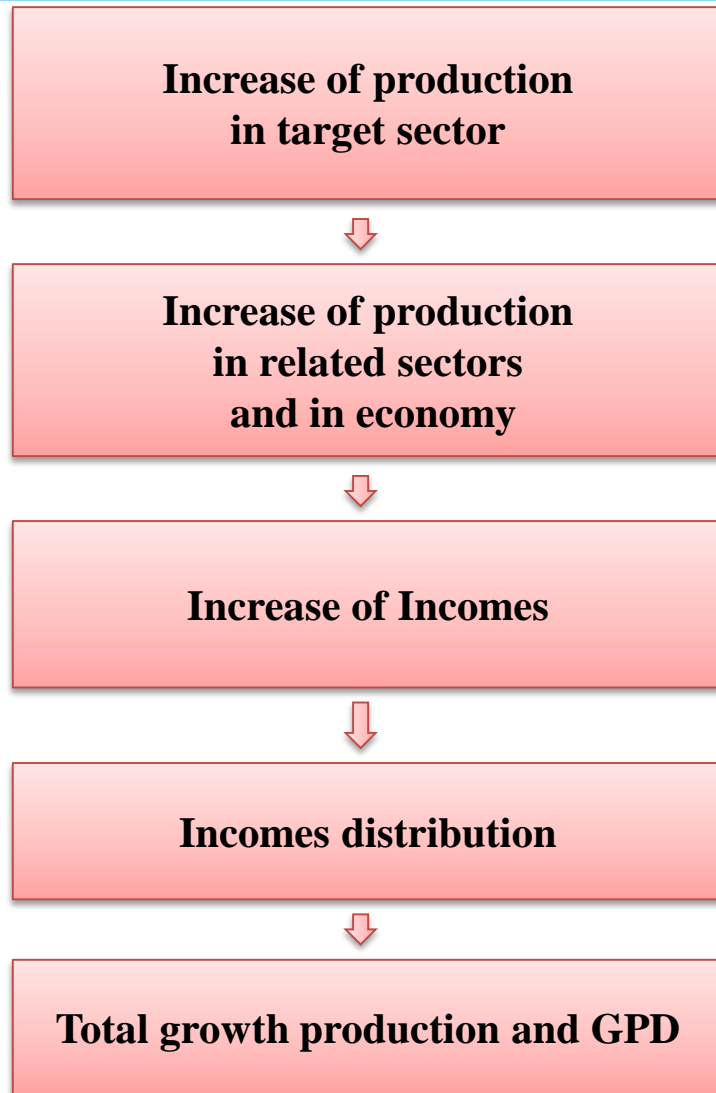
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Main multiplier effects

Analysis of macroeconomic consequences of changes in economic policy in relation to the single sectors of economy should be regarded as three major chain of interactions (as minimum):

- ***Direct:*** effects associated with the increase of production and investment activity in the target sector directly;

- ***Inter-industry:*** the increase of production and income changes in the sectors related to target sector;

- ***Additional income distribution:*** effects on distribution additional income for the benefit of household, nation, investment in equity.

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Multiplier Cycle

Increase of production in target sector

⬇

Increase of production in related sectors and in economy

⬇

Increase of Incomes

⬇

Incomes distribution

⬇

Total growth production and GPD

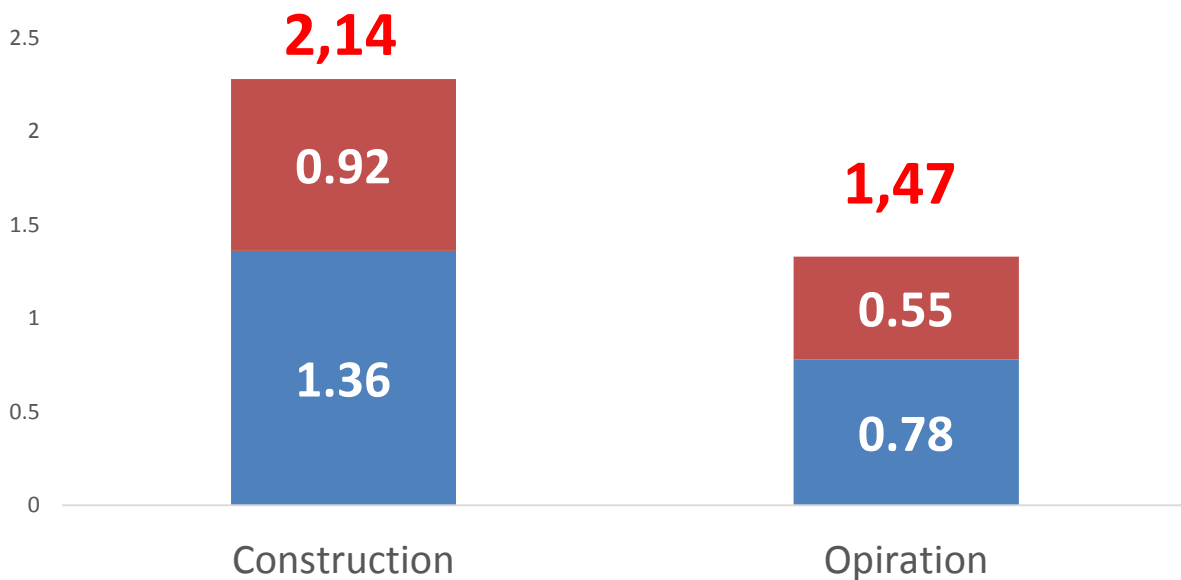**Intermediate consumption** ⬅ **Production**

⬇ ⬆

Added value ➡ **Final demand**

Multiplier shows the cycle of interactions in the real economy, calculating the actual current cost structure, value added and final demand

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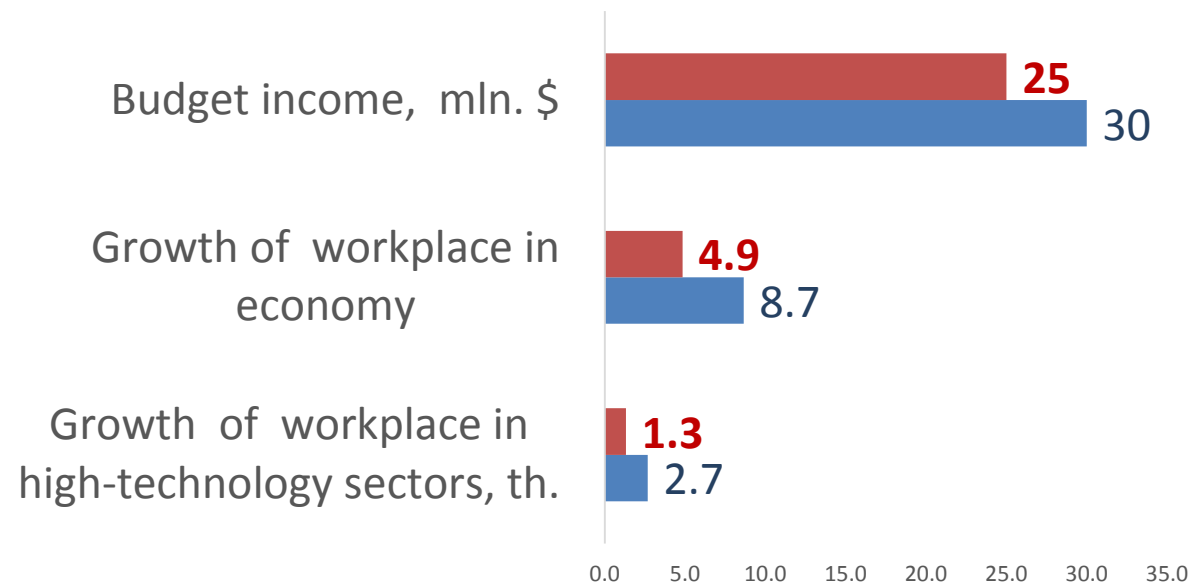RUSSIAN ACADEMY OF SCIENCES

Multiplier of NPP Construction and Operations in Russia (Static Methodology)

Multiplier of NPP construction and operations in RF per 100 mln. $ costs

Taking into account the actual cost structure, the **investment multiplier** of nuclear energy sector in RF can be estimated as 2.14 USD growth of output per 1 USD of costs or 0.92 USD GDP growth per 1 USD of costs.

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Impact of Imports on Investment Multiplicative Effect

The greatest **multiplicative effect is achieved with a minimum share of Imports**
in the procurement of products of related sectors,
when the largest volume of value added is realized in the country

Multiplicative economic effect

2.21

1.93

1.56

100   50   0

Share of Imports in the procurement of products, %

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The high value of the multiplier is not a decisive indicator,
more important is multiplicative effect, which is determined by the scale of the project and the ability to attract investment, that so important to the economy of the whole country

2.1

1.13

Multiplicative economic effect

0.1

0   50   100

«New» investment to the economy, %
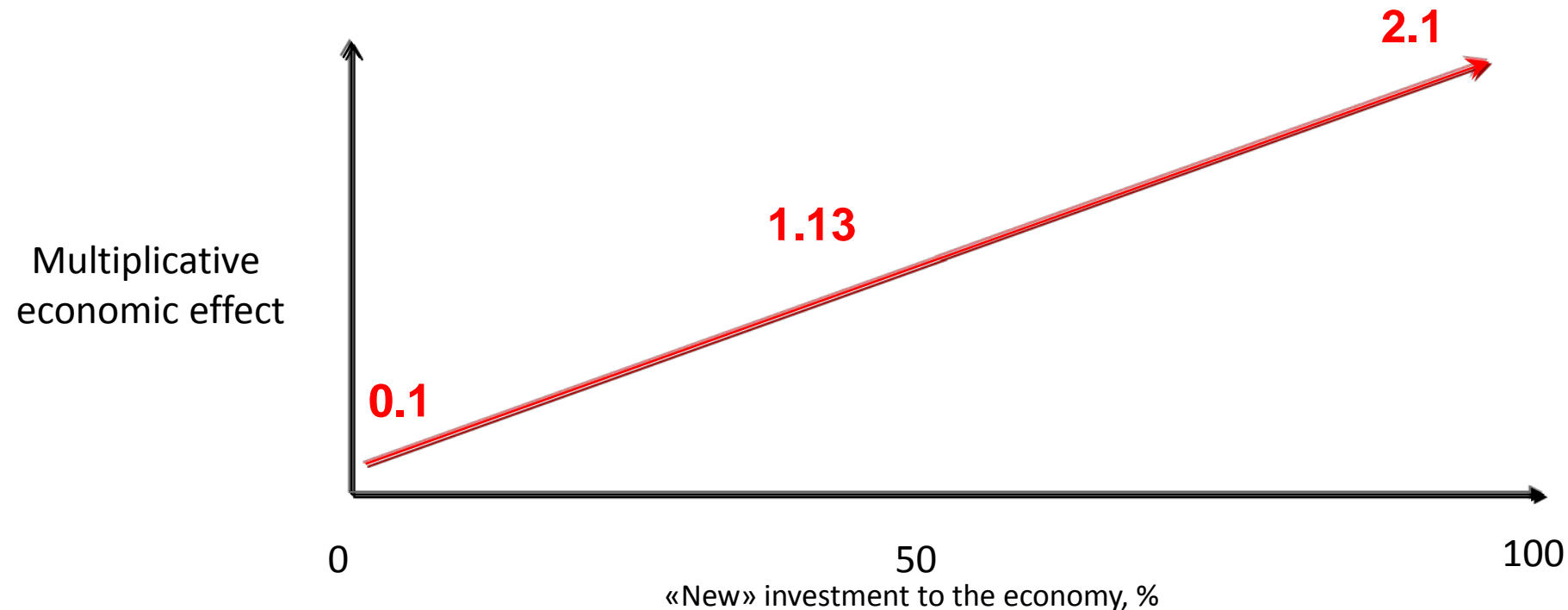
Sources of funding may also have **the impact on the multiplicative effect**.
Financing of the construction at the expense of other investment projects
reduces the multiplicative effect.

Effects of Nuclear Power Plant (NPP) construction

Country A
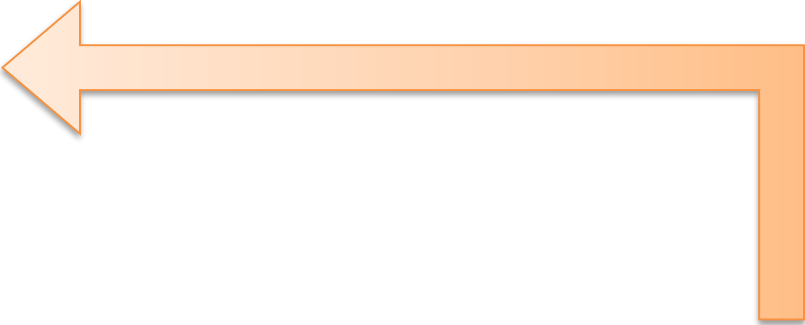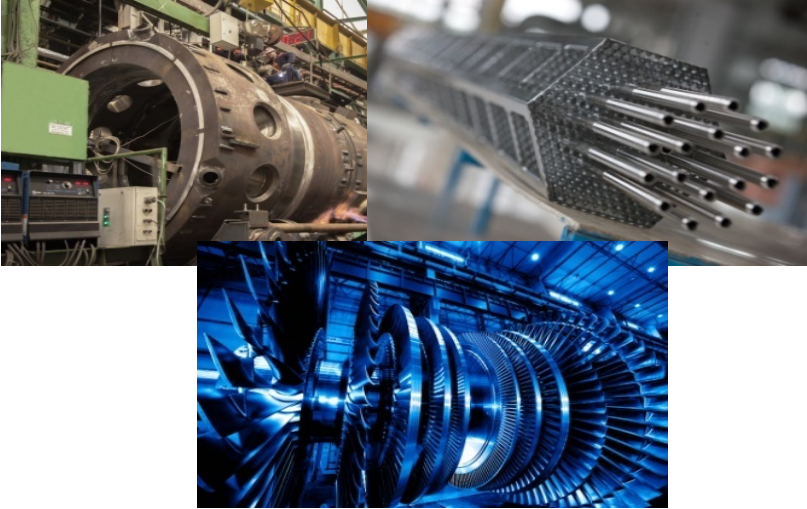
Country B

Construction

Operations

A	B	A	B
1. Engineering design 2. Equipment manufacturing	1. Construction 2. Supply of construction materials	1. Fuel Supply 2. Repairs and maintenance	1. Operation costs 2. Costs of labour

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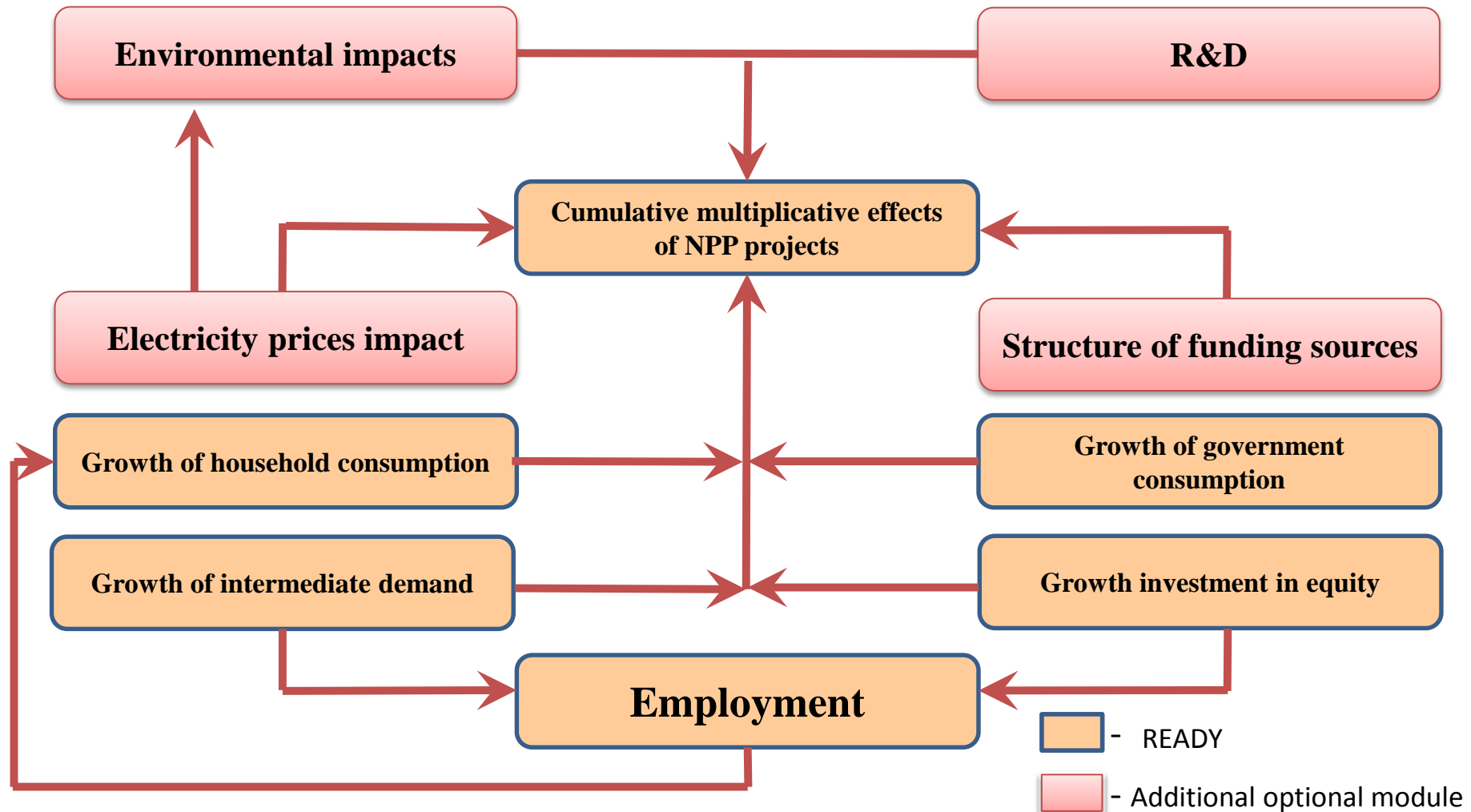
National «Input - Output» Tables:

- a. Has been developed officially updated Table «IO» 2011-2014. Tables: WIOD 2014 (2016) and IEF (RAS) 2013.

- b. Table of Federal Service of State Statistics (Rosstat) consists 186 industry sectors, IEF(RAS) – 45, WIOD – 36, NIOT – 56.

International «Input - Output» Tables:

- a. WIOD 2014 (2016)

- b. OECD

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Project – NPP (2 units)

Construction period (include preconstruction stage) – 14 years

Payback period – 15 years (operation period – 60 years)

Investment volume – $ 9.2 bln

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Multiplier Effects of the Project on Total Output for Russia

Cumulative increase in Russian total output caused by the project (constant prices, $ bln)

Legend:
- value added multiplier effect (exploitation stage)
- output multiplier effect
- value added multiplier effect (development stage)
- investment multiplier effect
- capital expenditure
- operating expense + taxes

Values: 0,0 0,1 0,1 0,2 1,4 1,9 2,6 3,2 4,5 5,8 7,9 11,7 13,7 15,6 17,3 18,1 18,6 18,9 19,2 19,4 19,7 20,0 20,3 20,6 20,9 21,1 21,4 21,7 22,0 22,3 22,6 22,9

12,1   9,2

годы

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Источник: расчёты ИНП РАН

Multiplier Effects of the Project on Total Output for Russia by sectors

Annual increase in Russian total output caused by the project (constant prices, $ mln)

illustrative calculations for year :
annual capital expenditure – $ 3.9 bln

Sector	Value
manufacture of machinery and equipment	863
financial service activities and insurance	281
manufacture of electrical equipment	277
manufacture of rail transport equipment	264
wholesale and retail trade; repair	222
manufacture of ferrous metals	168
electricity, gas, steam and air conditioning supply	149
manufacture of computer, electronic and optical products	129
transportation and warehousing	113
manufacture of motor vehicles, trailers and semi-trailers	108
rest of all	1213
annual increase in total output	**3786**

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Multiplier Effects of the Project on Total Output for Partner Country

Legend:
- value added multiplier effect (exploitation stage)
- output multiplier effect
- value added multiplier effect (development stage)
- investment multiplier effect
- capital expenditure
- operating expense + taxes

year

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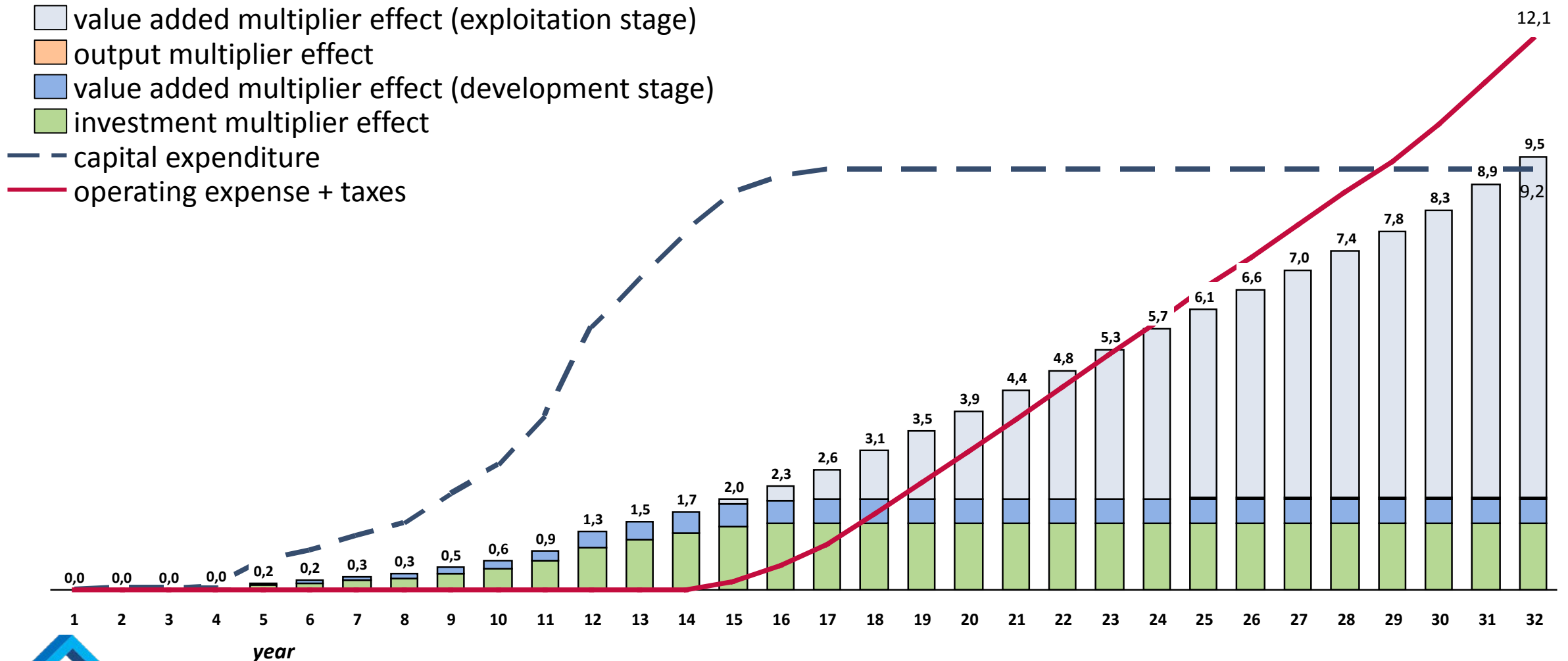
Multiplier Effects of the Project on Total Output for the Partner Country by sectors

Annual increase in total output in the partner country caused by the project (constant prices, $ mln)

illustrative calculations for year:
annual capital expenditure – $ 3.9 bln

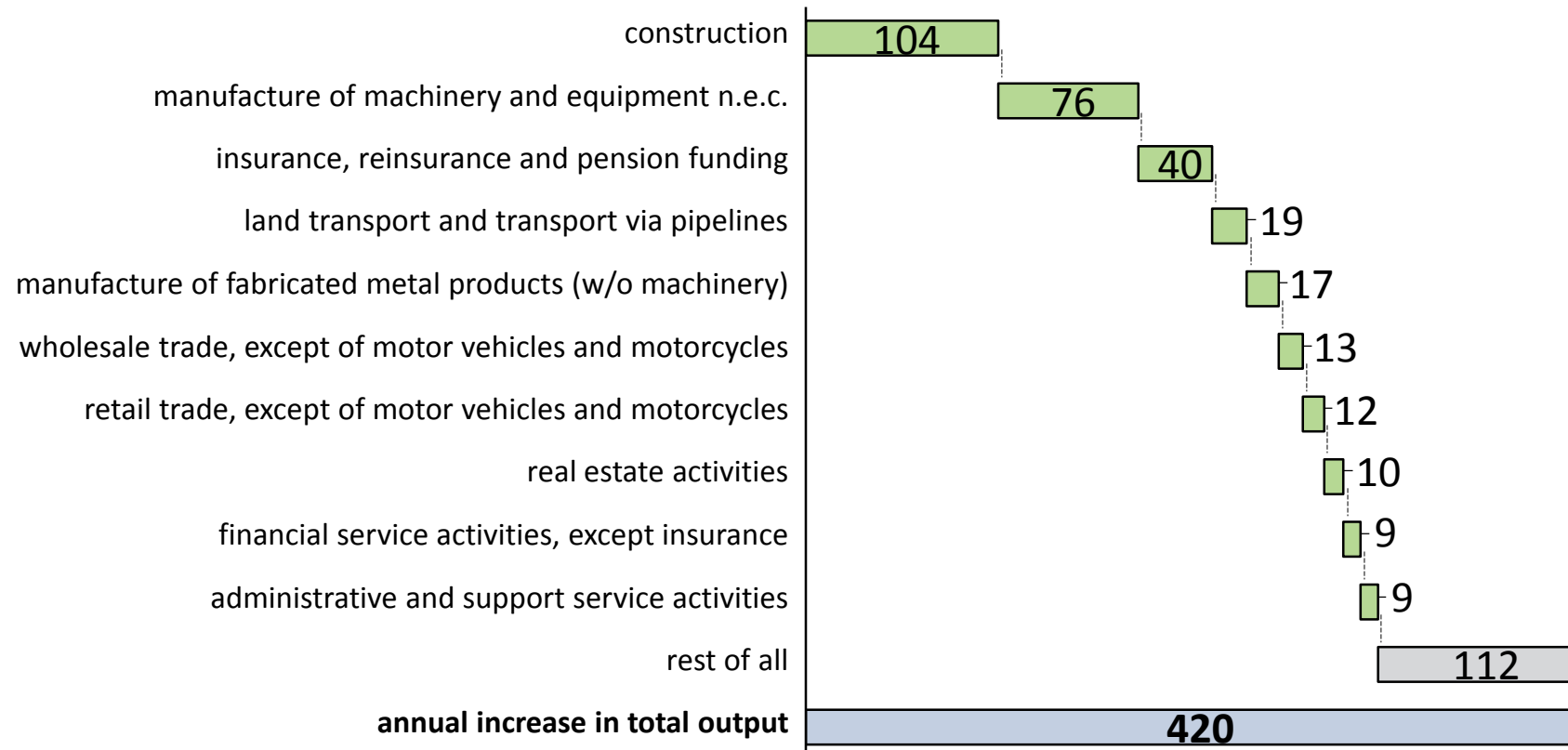|	
construction	104
manufacture of machinery and equipment n.e.c.	76
insurance, reinsurance and pension funding	40
land transport and transport via pipelines	19
manufacture of fabricated metal products (w/o machinery)	17
wholesale trade, except of motor vehicles and motorcycles	13
retail trade, except of motor vehicles and motorcycles	12
real estate activities	10
financial service activities, except insurance	9
administrative and support service activities	9
rest of all	112
annual increase in total output	**420**

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Source: IEF RAS

Total Effects

RUSSIA

Construction – $ 21.4 bln

Operation – $ 1.5 bln

Integral effect – $ 22.9 bln

Partner Country (country-recipient)

Construction – $ 1.9 bln

Operation – $ 7.6 bln

Integral effect – $ 9.5 bln

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CONCLUSIONS

- Calculations of multipliers can be one of the elements of macrostructure forecasting
- Estimates of the multiplier can be used in business-planning
- Current statistics allow you to evaluate the effects of implementing major international projects
- Simple method of calculating the multiplier effect is not so simple. Sooner or later you will come to the calculation of the inter-industry dynamic model