

Services in Russian Economy: Inter-industry Analysis

Since the crisis of 2008 the Russian economy has been experienced rather slow growth that make necessary search for the ways of driving the economy development. The economic politics only in the Manufacturing sector is usually considered. This is a motivation for the analysis of the Service sector development from the point of view of the progress of Russian economy as a whole.

Table 1. Structure of GDP production in current prices, % to total

	1990	1995	2000	2005	2010	2014
Agriculture, Hunting, Forestry and Fishing	16.6	7.0	6.5	5.0	3.9	4.2
Manufacturing and construction	48.9	38.8	38.6	37.9	34.7	35.8
Services, including:	35.0	55.4	54.9	57.0	61.4	60.0
trade	6.1	19.9	23.7	20.4	18.9	18.3
transport	10.0	11.9	9.0	10.2	9.1	8.7
finance and insurance	0.8	1.6	1.4	3.8	4.4	5.3
business services	5.1	7.0	9.6	9.9	12.2	12.2
personal services	10.1	9.7	6.6	7.5	8.5	8.9

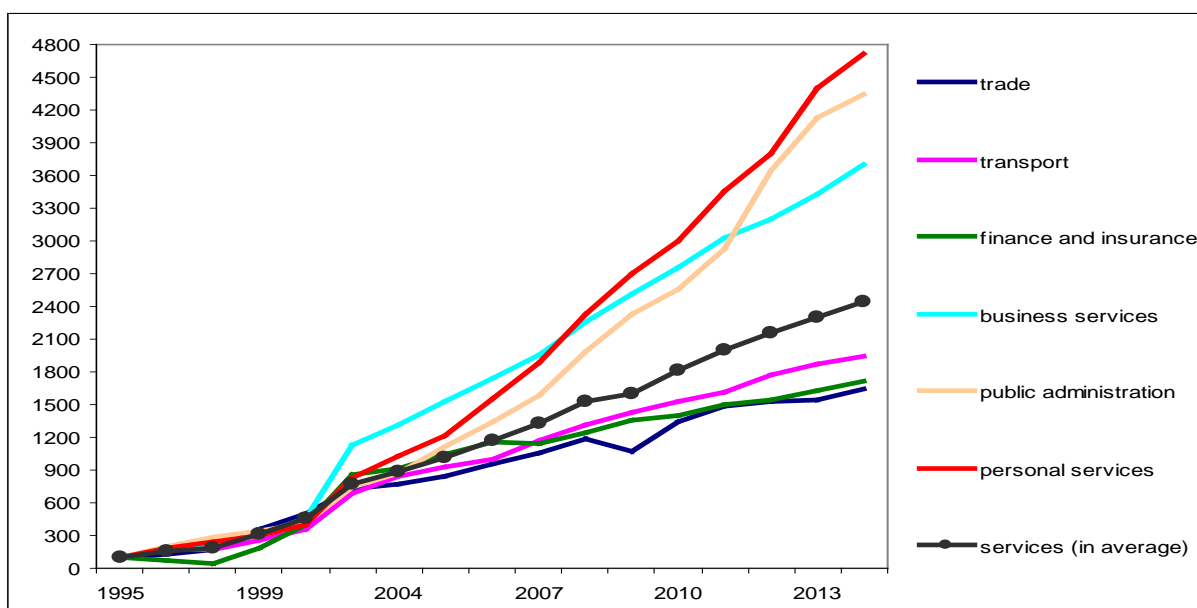
From the Soviet period the share of services branches in the GDP production almost doubled from 35% in 1990 to 60% in 2014 (Table 1). The most significant changes occurred in a rather short period 1990-1995. Trading was a leader: its share increased in 4 times during 1990-2000. The next 15 years its share decreased to 18% that is still in 3 times higher than in the Soviet times. In 2000-2014 rapid growth was observed for share of the finance and business services. On the one hand, Russia is in the global trend when the services branches produce the greater and greater part of the national GDP. But on the other hand, changes of production structure in our country were very rapid and were not supported by output and productivity growth in the Manufacturing industries.

There are two main reasons for the significant changes in the Russian economy structure. The first one is a more intensive real growth of the value-added in the Service sectors in comparison with Manufacturing, Agriculture and Construction. In Figure 1 we see much faster growth of the real value-added in the Service branches after 2004. The fastest growth was observed for the Finance and Trade services as well as for Transport and Business services. The Personal services real growth was next to zero. At the same time public administration services decreased almost in 3 times relative the Soviet level (Figure 2).

Figure 1. Real growth of value-added, % to level of 1995

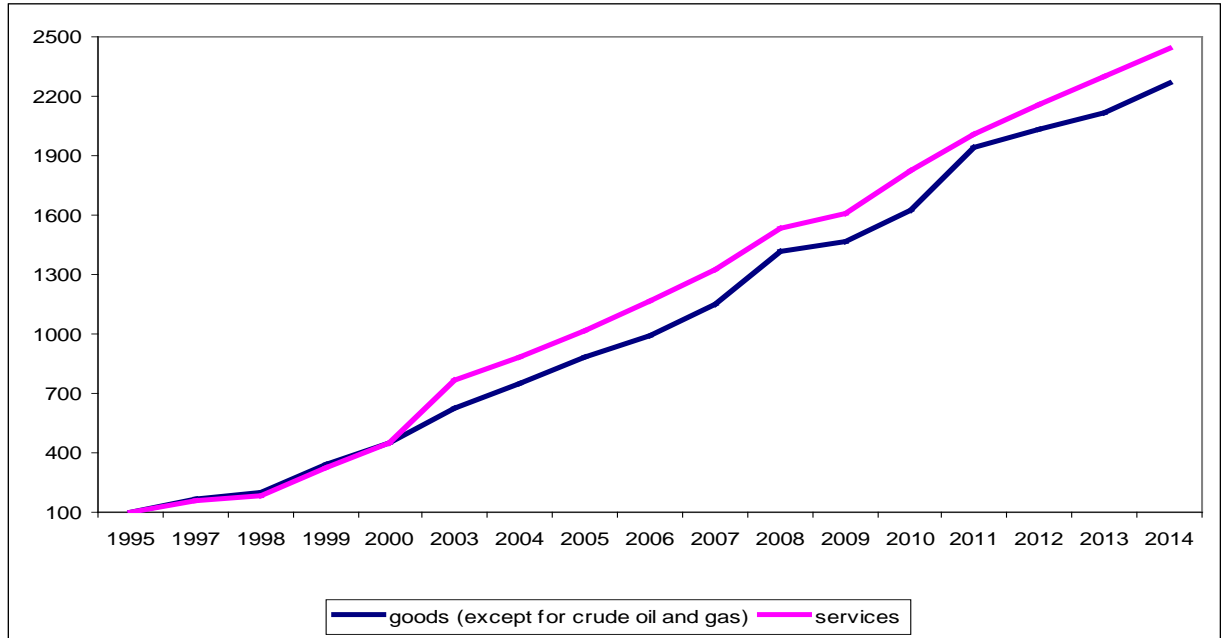


Figure 2. Real growth of value-added by branches, % to level of 1995



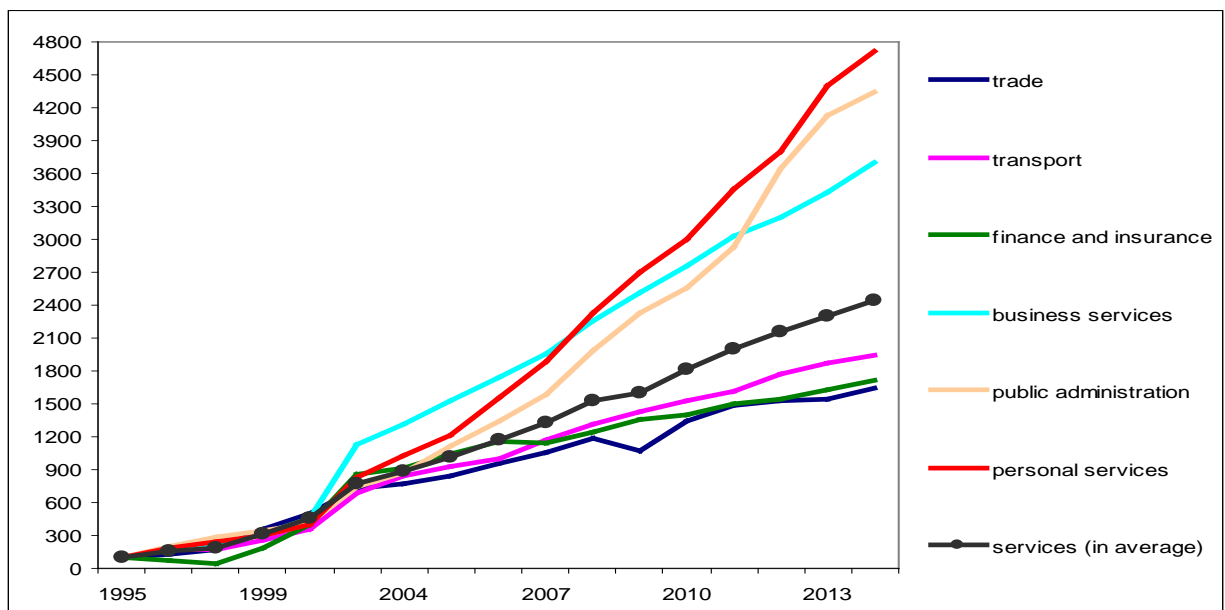
Not less important reason was the price growth that was greater for services in comparison with manufactured goods. The gap was about 6 percent points per year in average (Figure 3).

Figure 3. Deflator growth, % to level of 1995



Personal and public administration services had the most rapid growth. It's rather natural as we observed transition from social services financed by the government to the education and health system partly paid by households. Also high growth rates were recorded for the business and transport services (Figure 4).

Figure 4. Deflator growth by branches, % to level of 1995



The revealed gap between price growth rates for Services and for Manufacturing characterized the process of transferring the finances from the Manufacturing to the Service sectors.

And what about productivity factors? As we see in Figure 5, the share of Service industries in the gross investments is near 55% whereas the share in capital stock is about 70%. This discrepancy was reasoned by various depreciation rates in Manufacturing and Service sectors.

Figure 5. Share of service industries, % to total

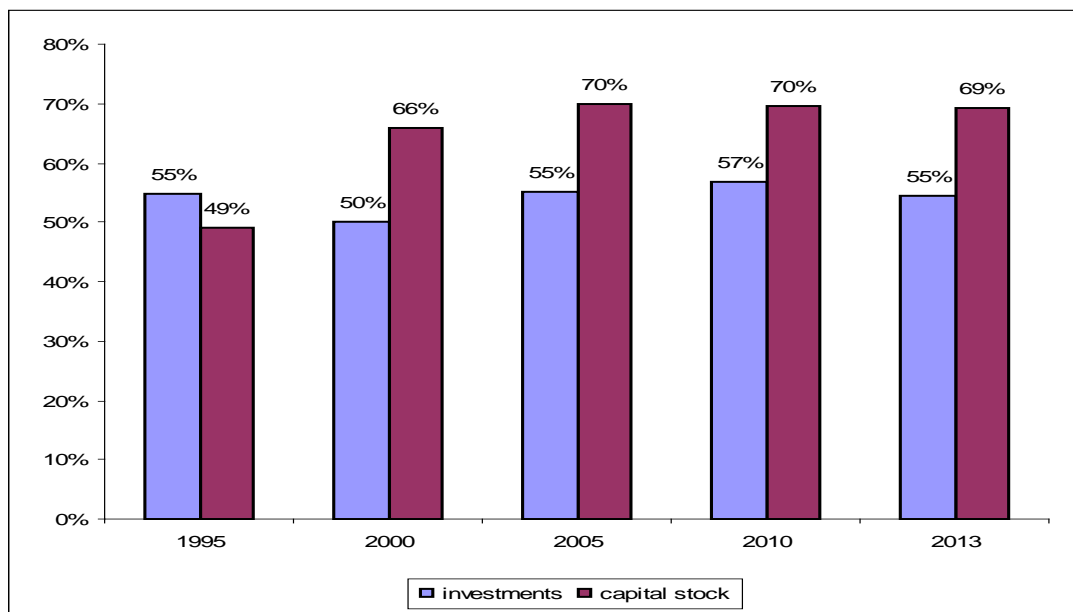
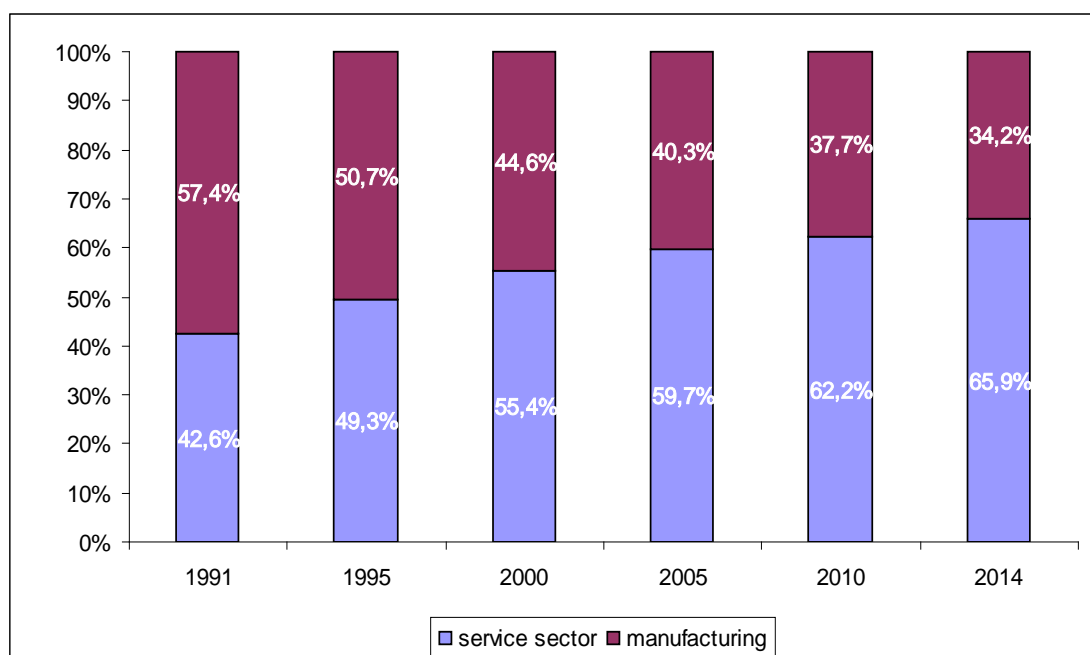


Figure 6. Structure of employment, % to total



As regards the labor force, the Service sector increased its share in total employment continuously from 1991 (Figure 6). The most rapid growth was observed for employment in Finance and Trade sectors (Figure 7).

Figure 7. Employment growth, to level of 1991

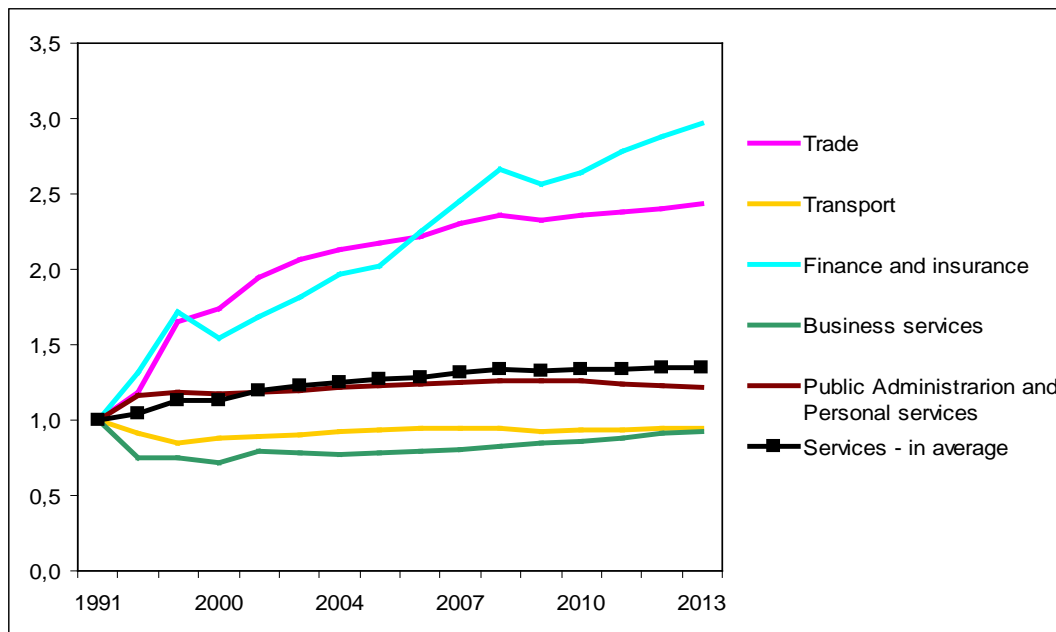
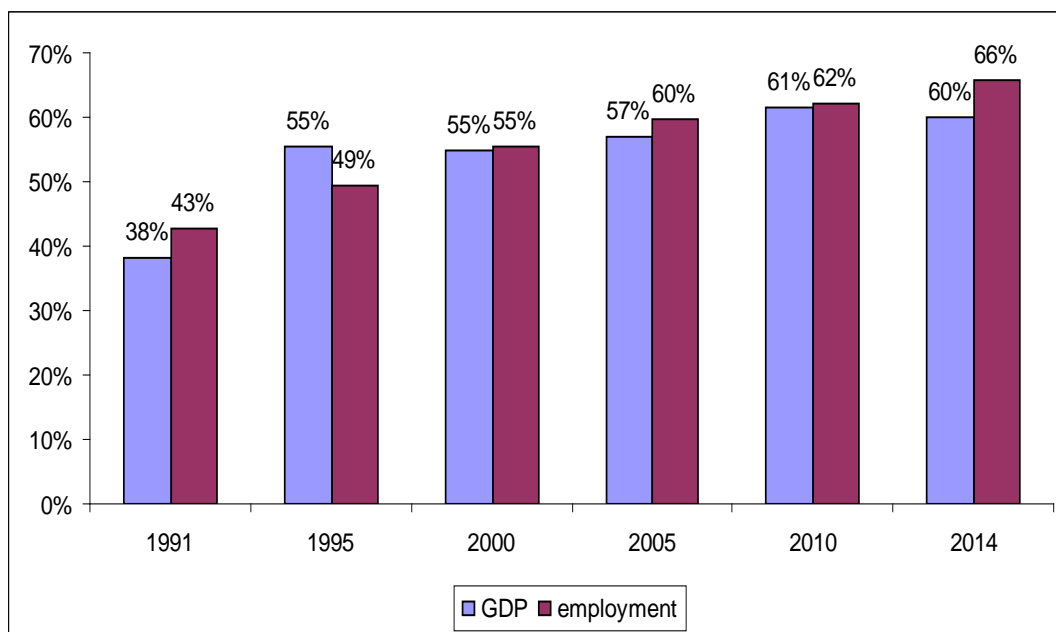


Figure 8. Share of service industries, % to total



But if we compare the structure of output and employment we see that the increase in the services' share in the total employments didn't cause the respective growth of the output share (Figure 8). It means that labor productivity in the Service sector is less than the average level in the economy. The Table 2 shows

that the greatest gap was observed for Trade branch as well as for education, health and other personal services. The low value of labor productivity for the last ones is reasonable as the most of these services are financed by the government. That means that they have a zero profit and the value-added is understated due to other industries. But when we talk about labor productivity in the Trading services we should remember that this sector uses the highest part of the labor force. So, the low productivity in this industry means an ineffective use of the huge labor force portion in Russia. And this situation is unacceptable as we face the rising limitation on the labor force supply.

Table 2. Labor productivity, % to average level in economy

	1991	1995	2000	2003	2008	2010	2013
Manufacturing	123,8	110,3	122,9	123,6	132,4	137,1	135,3
Service sector	68,0	89,5	81,6	83,2	79,8	77,7	79,3
including:							
Trade; hotels and restaurants	105,1	138,2	116,9	92,2	85,6	81,0	78,9
Transport and communication	69,1	119,4	97,8	121,0	112,7	112,4	110,0
Finance and insurance	228,7	162,5	119,5	201,8	186,2	165,5	182,4
Business services	52,3	72,8	94,0	111,3	113,5	107,6	106,1
Public Administration and Defence; Compulsory Social Security	160,4	181,6	111,7	119,4	100,0	98,4	113,0
Education	37,2	32,5	19,7	21,3	22,4	23,0	23,7
Health and Social Work	39,1	46,8	35,7	39,9	40,6	42,4	45,0
Other Community, Social and Personal Services	41,5	64,3	69,1	50,2	40,9	38,9	38,2

Now I want to proceed to the inter-industry part of my research. First of all let's see at a structure of the intermediate consumption by industries by means of input-output tables. The structure of the intermediate consumption is calculated by each column. The Table 3 shows that the intermediate consumption of trade and business services increased in the Manufacturing sector since 1990 (in terms of shares to the total intermediate consumption volume). At once, the inputs of transport and personal services have decreased. The similar situation was observed for the structure of the intermediate consumption in Agriculture where the share of trade input increased to 17-20%, finance input – to 8% and business services inputs – to 3% (Table 4). In the Construction the inputs of all services increased that

caused rise of the share of services in the total expenses from 21% to 37% percent (Table 5). As for inputs in Service sector, we see that the most growth was observed for finance and business services intermediate consumption (Table 6).

Table 3. Structure of intermediate consumption in Manufacturing, % to total

	1980	1990	2000	2010	2013
Agriculture, Manufacturing and Construction	66,6	69,4	63,3	65,0	63,2
Service sector	31,3	28,3	33,1	32,0	33,5
including:					
Trade; hotels and restaurants	11,3	11,9	21,3	15,3	15,5
Transport and communication	13,1	11,0	7,5	7,5	7,0
Finance and insurance	3,7	2,7	1,0	3,2	4,2
Business services	0,7	1,1	2,4	4,2	4,6
Public Administration and Defense; compulsory Social Security	1,5	0,9	0,6	1,6	2,1
Personal services	1,0	0,7	0,2	0,1	0,1

Table 4. Structure of intermediate consumption in Agriculture, % to total

	1980	1990	2000	2010	2013
Agriculture, Manufacturing and Construction	77,8	83,0	69,6	65,9	63,3
Service sector	20,4	15,2	29,3	32,5	35,1
including:					
Trade; hotels and restaurants	10,4	8,5	19,9	16,1	17,1
Transport and communication	7,4	5,1	6,2	6,6	6,1
Finance and insurance	2,0	1,2	1,4	5,8	7,6
Business services	0,1	0,2	1,5	3,2	3,3

Public Administration and Defense; compulsory Social Security	0,3	0,1	0,2	0,8	1,0
Personal services	0,2	0,1	0,1	0,1	0,1

Table 5. Structure of intermediate consumption in **Construction**, % to total

	1980	1990	2000	2010	2013
Agriculture, Manufacturing and Construction	76,7	67,9	59,3	62,3	61,5
Service sector	21,1	30,4	37,3	35,9	36,6
including:					
Trade; hotels and restaurants	13,1	9,1	20,5	14,7	14,5
Transport and communication	2,3	17,6	13,3	12,2	11,2
Finance and insurance	3,6	2,3	1,2	3,9	5,2
Business services	0,5	0,6	1,8	4,3	4,7
Public Administration and Defense; compulsory Social Security	0,7	0,3	0,3	0,7	0,9
Personal services	0,9	0,5	0,2	0,1	0,1

Table 6. Structure of intermediate consumption in **Service sector**, % to total

	1980	1990	2000	2010	2013
Agriculture, Manufacturing and Construction	49,9	52,4	38,5	36,3	34,5
Service sector	47,4	44,7	57,5	59,5	61,0
including:					
Trade; hotels and restaurants	15,8	16,1	24,2	17,1	16,9
Transport and communication	23,8	21,1	21,5	19,1	17,8
Finance and insurance	2,6	2,4	1,7	4,9	6,1

Business services	2,0	2,6	8,2	15,0	16,1
Public Administration and Defense; compulsory Social Security	0,9	0,6	1,2	3,1	3,8
Personal services	2,3	1,8	0,6	0,4	0,4

The most significant changes occurred for the structure of the personal consumption. The share of trade services grew from 21% in the Soviet period to 36% whereas expenses for personal services didn't exceed 4% (Table 7).

Table 7. Structure of personal consumption, % to total

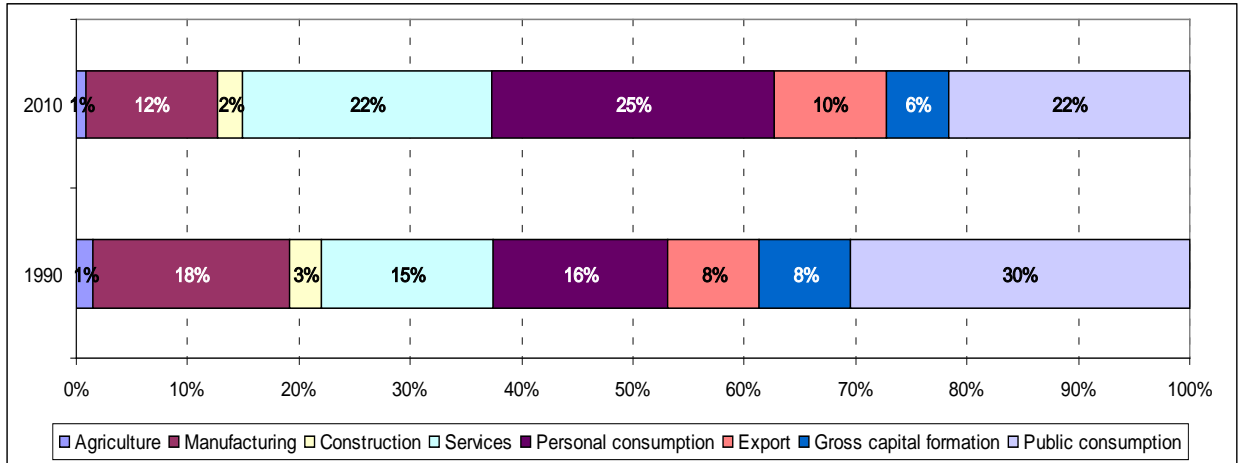
	1980	1990	2000	2010	2013
Agriculture, Manufacturing and Construction	62,6	61,4	33,6	28,6	27,8
Service sector	30,1	30,7	49,4	53,6	54,4
including:					
Trade; hotels and restaurants	21,4	21,2	34,7	36,2	36,6
Transport and communication	5,0	5,3	5,0	5,4	6,2
Finance and insurance	0,1	0,1	0,6	0,5	0,1
Business services	1,4	1,5	5,0	6,3	6,3
Public Administration and Defense; compulsory Social Security	0,4	0,3	0,8	1,6	1,8
Personal services	1,8	2,3	3,2	3,6	3,4

The conclusion is that the Agriculture, Manufacturing and Construction sectors have changed the structure of their intermediate consumption by increasing the share of trade, finance and business inputs that was caused by more rapid price growth for these services. But the most significant changes were observed for the structure of the household demand.

The changes in input's structure led to the corresponding changes in structure of the services output using. This structure is calculated for each row. Households

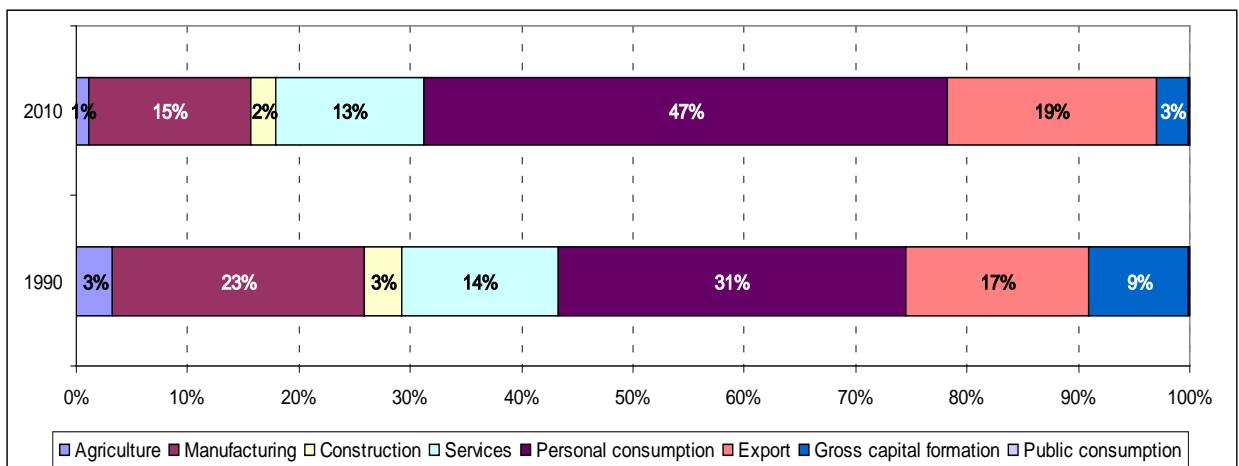
and service sector became main consumers of services whereas Manufacturing and Public Administration sectors reduced their share in services consuming (Figure 9).

Figure 9. Structure of using of Services output by destinations, % to total



As for the Trade services consumption structure, the households consumed about a half of the total Trade output in 2010 (Figure 10). Moreover, high share of trading in the personal consumption gives a good chance for the Trade industry development but at the same time strongly limits the output growth in the other industries as personal consumption is the greatest part of the final demand.

Figure 10. Structure of using of Trade output by destinations, % to total



The next stage of the analysis is an attempt to understand if structure of industries' inputs and outputs in Russia comparable to the same structure in other countries. In order to make such comparison I use the US I-O tables from the WIOD database. As for Manufacturing the difference is rather small at first glance (Figure 11). But on closer examination we see a huge gap for consuming trade services: its share in intermediate consumption of the Russian manufacturing industries is 24% whereas for USA its value is only 13%. At the same time share of costs on finance and business services in the Manufacturing sector are in 5 times less than in the USA one. As for Service sectors, the gap in the share of services is about 1.5 times (Figure 12). Greater intermediate consumption of trade services is observed for the Russian services sector too. But the US service sector consumes much more finance and business services that means more availability for producing various and advanced services.

Figure 11. Services share in structure of intermediate consumption of Manufacturing industries, % to total

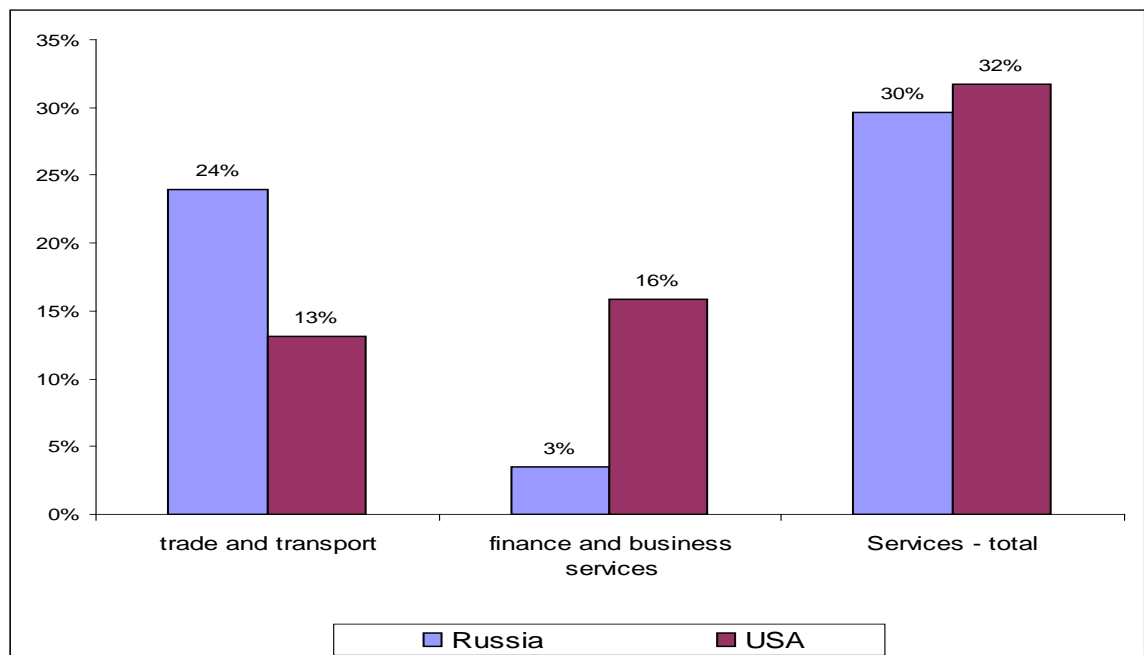
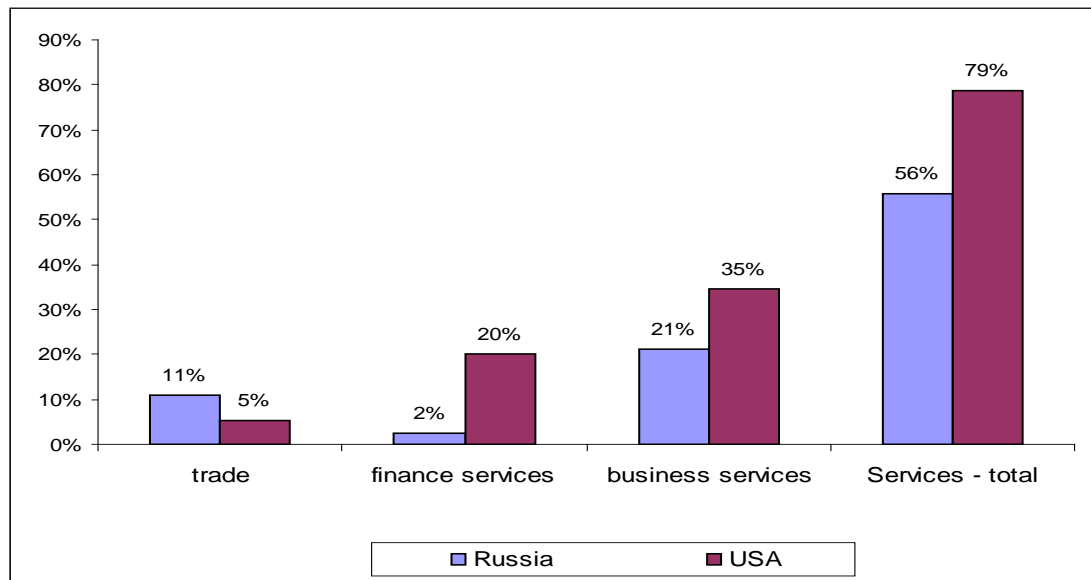
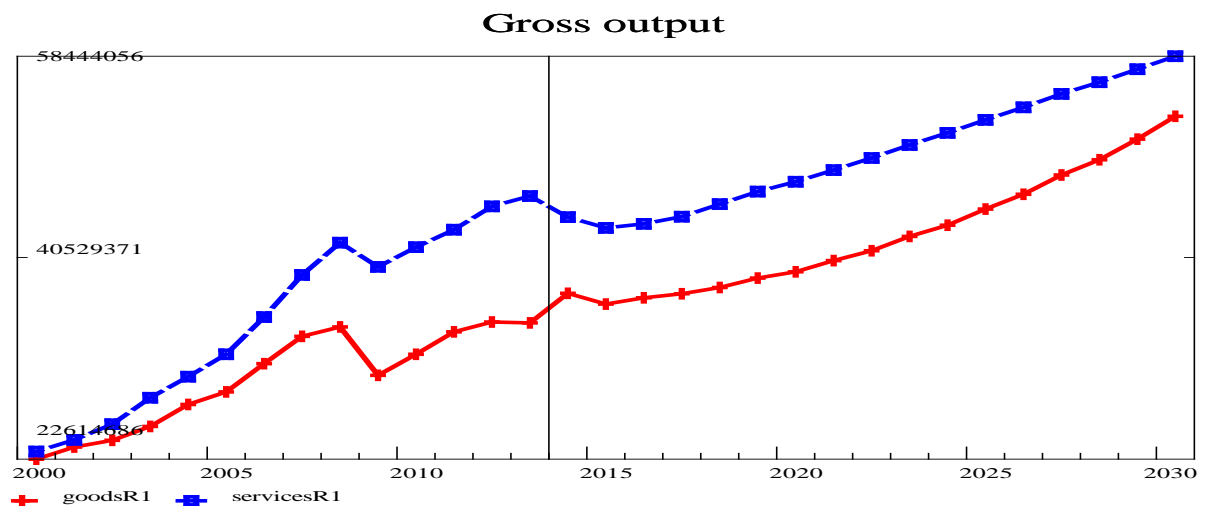


Figure 12. Services share in structure of intermediate consumption of Service sectors, % to total



As a result, it's possible to make a conclusion that the Service sector development in Russia is less effective than the US one. The main Russian service producer is trading whereas the finance and business services are leader in the USA. Low labor productivity in the Trade service along with high employment in this industry may cause the considerable restrictions for the economic growth in Russia for the long-term perspective. As the evidence, I show the simulation results for the business-as-usual scenario calculated in frame of the RIM model. The average growth rate of the gross output will not exceed 2.3% per year (Figure 13, blue line – service branches, red line – Manufacturing industries).

Figure 13. Gross output in constant prices.



The share of the Service sector in output production will decrease from 51% to 47.5% (Table 8). The labor productivity in the Service branches will be almost twice less than the productivity in the Manufacturing industries. Productivity pattern in Trade sector will become worse that will require the employment growth. As a result the employment in other service industries will be shrunk and the Russian service sector will face the necessity of the significant growth of the labor productivity.

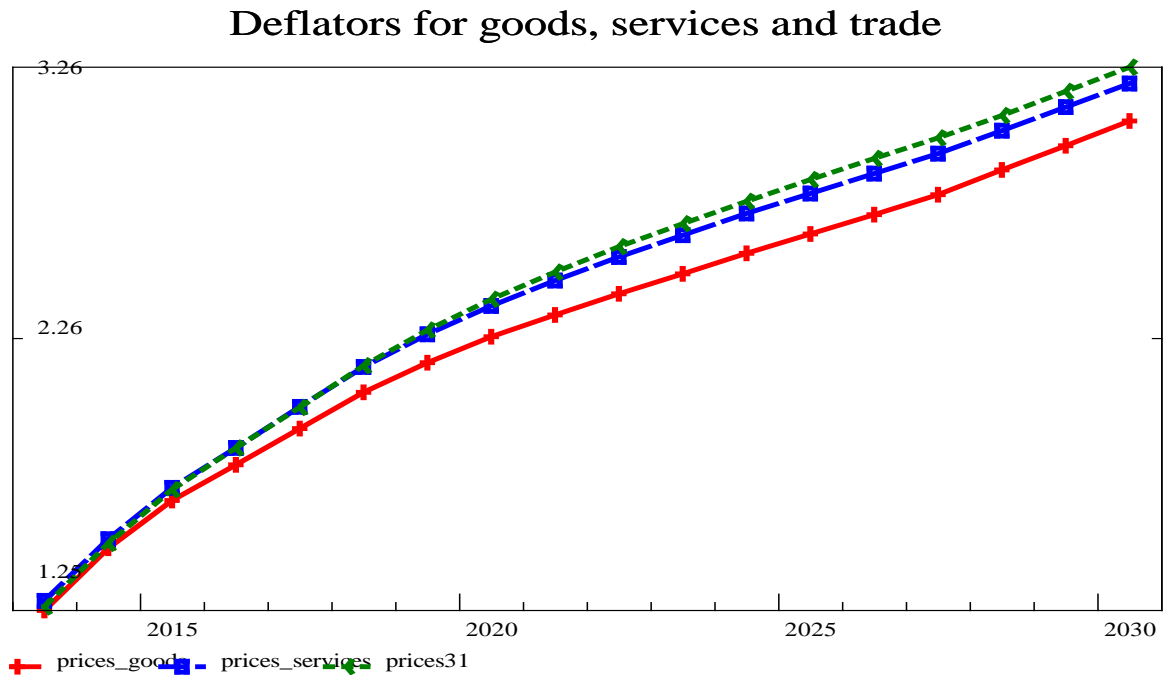
Table 8. Simulation results (business-as-usual scenario).

% to the total (or average) value for economy as a whole	Output		Employment		Labor productivity	
	2013	2030	2013	2030	2013	2030
Agriculture, Manufacturing and Construction	49.2	52.5	36.9	41.1	132.0	133.6
Service sector	50.8	47.5	63.1	58.9	81.2	79.3
including:						
Trade; hotels and restaurants (including trade margins)	16.6	17.5	20.1	27.1	85.2	62.6
Transport and communication (including transport margins)	8.5	8.6	8.1	8.3	112.3	108.6
Finance and insurance	3.4	3.7	1.9	0.5	182.0	511.0
Business services	9.4	7.8	8.7	5.3	112.5	165.6
Public Administration and Defense; compulsory Social Security	6.2	4.8	5.4	3.7	99.0	110.8
Personal services	6.7	5.1	18.9	14.0	32.6	28.7

As regards the prices growth rates, they will be higher in Service sector than ones for the manufactured goods that will cause an intensive transition of the

financial resources from the Manufacturing sector to Services (Figure 14, red line – goods, blue line – services in average, green line – trade services).

Figure 14. Deflators, to level of 2010.



The second scenario (called “Prices scenario”) was simulated by the RIM model with transformed equations for deflators of three sectors: Trading, Real estate and Equipment rental. In classical Leontief price model (used for business-as-usual scenario) a deflator for each industry is calculated as a function of its intermediate consumption in current prices and nominal value-added share in output:

$$p_i = \sum a_{ij} * p_j + (va_i / out_i) \quad (1)$$

where $i=1, \dots, 44$ is an industry number,

va = wages + gross profit + taxes

wages = f (labor productivity, p_i , out_i)

gross profit = f (profitability ratio, out_i)

In the price restriction scenario we apply type of equation (1) to all industries except the three ones mentioned above. For these selected industries we determine the price level by the average price growth rates for an economy as whole. It

means that the trade, real estate and equipment rental deflator growth rates will not exceed the average price growth rate:

$$p_i = f(\text{Gross output deflator}), i=31,36,37 \quad (2)$$

$$\text{gross profit} = \text{outR}_i * p_i - \text{wages}_j - \text{tax}_j - (\sum a_{ij} * p_j) * \text{outR}_i$$

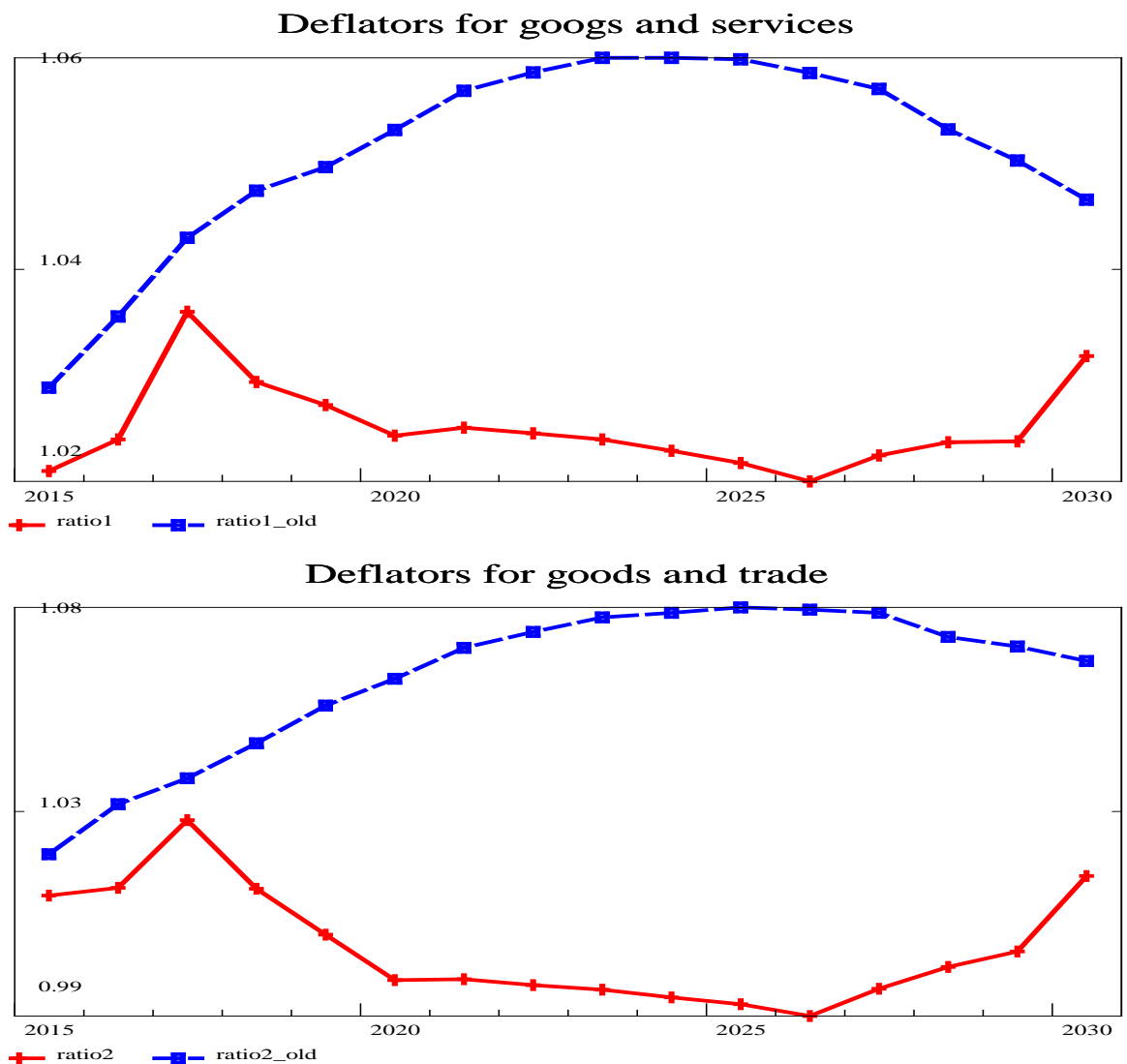
$i = 31$ Wholesale and retail trade

$i = 36$ Real estate

$i = 37$ Equipment rental

The differences in annual prices growth between services and goods are shown in Figures 15-16. The blue line is for the business-as-usual scenario and the red one – for the prices scenario.

Figure 15. Differences in annual prices growth between services and goods



In the first scenario the prices for services will grow faster than ones for goods and this gap will be 2-6 p.p. per year. The gap between trade services deflator and goods one will be even more – 3-8 p.p. per year. The restrictions on growth rates of selected services deflators in the second scenario allow to have an equal growth both for goods and services. This price equality will lead to an acceleration of the gross output growth in the Manufacturing industries due to the business-as-usual scenario’s results, first of all in the high- and medium-technology ones (Table 9). The acceleration will be observed for trading and business services industries too as the price reduction will cause growth of intermediate and final consumption. As for the output structure the share of non-service sector will increase to 56% which is 3 p.p. more than in the first scenario.

Table 9. Simulation results for the price restriction scenario.

differences in price restriction scenario’s results (relative to the business-as-usual scenario)	Gross Output, annual growth rate, p.p.		Industry Output, % to Gross output	
	2015-2025	2026-2030	2015-2025	2026-2030
Agriculture, Manufacturing and Construction, including:				
High-technology industries	+0.6	+0.6	+0.1	+0.1
Medium-high-technology industries	+0.6	+0.3	+0.1	+0.2
Medium-low-technology industries	+0.2	-	+0.4	+0.5
Low-technology industries	+0.2	-0.1	-	-
Service sector, including:				
Trade; hotels and restaurants (including trade margins)	+0.1	-	-1.3	-1.4
Business services	+0.3	-0.1	-0.3	-0.2

Conclusions

1. The importance of services for the Russian economy grew a lot especially in 1990-1995. The Service sectors used the most part of total capital stock and employment;

2. At the same time, the growth of the service prices was more rapid than the one of the manufactured goods that led to the finances transfer from the Manufacturing to Service branches;

3. Besides, the rapid price growth in the Service sector caused increase of its share in intermediate consumption of other industries that reduce value-added in the Manufacturing industries;

4. Comparison with the US I-O tables shows significant differences in the intermediate consumption structure associated with higher share of trade services and less share of finance and business services both in Manufacturing and Service sectors' costs;

5. The results of business-as-usual scenario can't be considered as acceptable due to the very moderate growth of the gross output. The price restriction scenario simulations show a good opportunity for the economy growth acceleration by means of increase of output in high- and medium-technology industries.