



Региональные последствия вступления России в ВТО

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Following David Tarr's presentation on WB courses.

I. Introduction

- Numerous commentators, including the Prime Minister have requested estimates of the impact of WTO accession.
- Russian businessmen have expressed fear their sectors will decline because their tariff will decline. The government has, appropriately responded that economy-wide effects may mitigate or reverse the impact of tariff reduction—but no estimates to date.
- Popular press—many negative assessments of accession
- Need to articulate the sources of the gains from accession for the public and for critics—
- National model: Tarr et al (2004), regional model: Rutherford and Tarr (2007)

Sources of gains

1. Improved market access — government focuses on this.

Tarr et al (2004) model this as a terms of trade gain. But given bilateral MFN status, the gain here should come primarily from improved treatment in antidumping, i.e., not a big terms of trade shift.

2. Russian tariff reduction leads to improved resource allocation and to productivity gains from the increase in available varieties of goods.

But the Russian tariff is not very high (1.6% of GDP or about 7% of the value of imports in **2005-2006**); so this effect should not be big in constant returns to scale models.

Productivity modeled endogenously in a Dixit-Stiglitz-Ethier framework, i.e., product diversity increases firm level productivity and consumer utility.

Comparative static application of Rutherford and Tarr, JIE (2002).



Sources of gains

3. Russian FDI liberalization leads to productivity gains from new multinational service suppliers

Endogenously modeled in a Dixit-Stiglitz-Ethier framework but also foreign direct investment required for multinational service firms to supply the Russian market.

4. Potential growth effects—in a comparative steady state model.

Employed previously by Koopmans; Manne; Baldwin and Francois; Harrison, Rutherford and Tarr.

Upper bound estimate of welfare gains in the model, but full dynamic effects not modeled.

Key modeling assumptions

- Key to the analysis is that barriers to FDI in services are **significant**. Likely to be the biggest impact.

But then necessary to model liberalization of barriers to FDI in services.

- Key modeling assumptions are that:
 - a substantial portion of business services **require a domestic** presence;
 - multinational service providers import some **specialized capital** or labor as part of their decision to establish a domestic presence; and
 - **business services** supplied with a domestic presence are supplied by imperfectly competitive firms who produce a **unique variety** of the service.
 - the Dixit-Stiglitz-Ethier structure for business services (and for increasing returns to scale goods) that implies **endogenous productivity gains** from the net introduction of new varieties.



II. Conceptual Framework

- Small Open Economy (SOE) Model—implies no (virtually no) terms of trade effects.
- There are 35 sectors in the model that are listed in Table 1.
- 22 sector 1995 Russian input output table has been expanded to 35 sectors for this project by S.P. Baranov.



Conceptual Framework

- Primary factors include capital, skilled and unskilled labor, and sector-specific workers. 25 % of the labor in all sectors is sector specific.
- There are five types of capital:
 - fully mobile (about 46%);
 - rents from licenses (about 2%);
 - specific capital in energy sectors reflecting mineral resources (about 15%);
 - sector specific capital in imperfectly competitive domestic goods and services (about 32%);
 - and sector specific capital used by multinational service providers (about 5%).



Conceptual Framework: Industrial Structure

There are three types of sectors among the 35 sectors

1. Perfectly competitive sectors

– both goods and services.

These goods and services, which are produced under constant returns to scale, are differentiated in the demand functions of Russian consumers and firms—the Armington assumption.



Conceptual Framework: Industrial Structure

2. Goods produced under increasing returns to scale and imperfect competition.

Imperfectly competitive domestic goods producers face competition from foreign firms.

Foreign firms produce the good abroad.

Demand from both firms and consumers is characterized as a Dixit-Stiglitz-Ethier composite of domestic and import varieties with firm-level product differentiation.

In **all** imperfectly competitive sectors

(goods and services):

- Marginal costs are constant and there is a fixed cost;
- Firms set prices such that marginal cost equals marginal revenue;
- There is free entry, which drives profits to zero.

Chamberlinian large group monopolistic competition assumption, which results in constant markups over marginal cost.

The composition of fixed and marginal cost is identical in all increasing returns to scale sectors. This implies that the ratio of fixed to marginal cost is a constant. Then it follows that output per firm for all firm types remains constant, i.e., the model does not produce rationalization gains or losses.



Productivity effects from additional varieties

Aggregate productivity is affected by the number of varieties using the standard Dixit-Stiglitz-Ethier formulation.

Dual to the Dixit-Stiglitz quantity aggregate is a cost function. This cost function declines in the total number of firms in the industry.

The efficiency gains associated with an increased number of varieties accrue to both consumers and firms using these goods as intermediate inputs.

Algebraic Formulation of the model

- Services Z enter the production function as a CES aggregate of domestic and multinational services

$$1) \quad Z_x = (ZD^\gamma + ZM^\gamma)^{1/\gamma}$$

- Domestic and imported services are CES aggregates of domestic and multinational firm varieties, respectively.

$$2) \quad ZD = \left[\sum_{i=1}^{n_d} z d_i^{\delta_d} \right]^{1/\delta_d} \quad ZM = \left[\sum_{i=1}^{n_m} z m_i^{\delta_m} \right]^{1/\delta_m}$$

This is pure firm level product differentiation.

Algebraic Formulation of the model

- Dual to the Dixit-Stiglitz quantity aggregates are Cost Functions that reflect the cost of purchasing service varieties at minimum cost:

$$3) \quad CM = \left[\sum_{i=1}^{n_m} p_{zm_i}^{1-\sigma_m} \right]^{1/1-\sigma_m}$$

$$4) \quad CD = \left[\sum_{i=1}^{n_d} p_{zd_i}^{1-\sigma_d} \right]^{1/1-\sigma_d}$$

$$5) \quad CM = \frac{p_{zm}}{n_m^{\sigma_m-1}} \quad CD = \frac{p_{zd}}{n_d^{\sigma_d-1}}$$

- Thus, costs decline with the number of varieties—the Dixit-Stiglitz love of variety effect.



Examples:

- Machine tools—1 billion dollars for the economy spent on one available tool or 1000 tools—the latter increases productivity.
- Restaurants—\$100 per month spent on one available restaurant for lunch or 20 available restaurants. The latter increases utility.

Foreign firms supply the Russian market with production facilities abroad, but the number of foreign firms that are present in the Russian market depends on quasi-rents available in the Russian market, which in turn depends on the tariff rate.

- Ignoring intermediates, cost functions of domestic and multinational service providers are (r and w are vectors of rental rates on different types of capital and wage rates of different types of labor) :

$$C^D(zd) = c_d z d + f_d$$

$$c_d = c_d(w_\ell, r_K, r_d^K, p)$$

$$C^M(zm) = c_m z m + f_m$$

$$c_m = c_m(w_\ell, r_K, r_m^R, p, p^V)$$

- Multinationals use an imported input V, so they use Russian inputs less intensively.

3. Services sectors that are produced under increasing returns to scale and imperfect competition.

The Dixit-Stiglitz-Ethier formulation applies again with firm level product differentiation.

Differences from imperfectly competitive goods sectors — for these services, two types of firms operate:

- **Multinational** service firm providers must establish a domestic presence in order to compete in the Russian market. They must import some of their technology or management expertise to do this. They incur costs related to both imported inputs and domestic good and factor inputs.

3. Services sectors that are produced under increasing returns to scale and imperfect competition.

- **Domestic** service providers are similar to domestic goods providers in that they do not import foreign technology or management expertise. There is a discriminatory tax on multinational firms in the benchmark (lack of national treatment; the distortion is not at the border). This discriminatory tax is changed in the WTO accession counterfactual.

Model also allows cross border trade in services under CRTS. But not a good substitute of services provided with a domestic presence.



Comparative Steady State Formulation

Data

Input-Output table

The core input-output model is the 1995 table produced by Goskomstat. The official table contained only 22 sectors, and importantly has little service sector disaggregation. Consequently, Russian input-output expert S. P. Baranov disaggregated this table into a 35 sector input output table. Baranov used unpublished data available to Goskomstat based on the surveys that were used to construct the 1995 table.



Comparative Steady State Formulation

Tariff data

Data for tariff rates are based on the trade and tariff data available after the tariff simplification plan of late 2000; the Customs Committee of Russia publishes these data.

Specifically, we begin with the legal tariff rates that applied at the tariff line level on January 1, 2001.

In 2006 Russian tariff rates were not high by the standards of developing countries, although they were higher than most industrialized countries. They were only about 1.6% of GDP (or 7% of the value of imports) based on Customs Committee data; or 1.2% of GDP (or 5 % of the value of imports) based on Ministry of Finance data.

Estimation of the Barriers to Foreign Direct Investment in Services Sectors

- WB commissioned 20 page surveys from Russian research institutes that specialize in these sectors to assess the regulatory environment in these sectors.
- Kimura, Ando and Fujii (2004a, 2004b, 2004c) then estimated the ad valorem equivalence of barriers to foreign direct investment in telecommunications; banking, insurance and securities; and maritime and air transportation services.
- Application of studies in C. Findlay and T. Warren (2000).



Scenario design

Elements of the WTO accession counterfactual package

- Tariffs reduced by 50% across the board.
- Discriminatory tax on multinationals service providers removed.
- Improved terms of trade due to improved market access of from 0.5%-1.5% for seven sectors, listed in table 5.

Welfare Effects of WTO Accession

Comparative static results

- WB estimates that the gains to Russia are equal to 7.2 % of Russian consumption (or 3.3 % of GDP).
- These are large gains compared to the typical CRTS estimates (the Harberger constant).
- These gains derive from all of the three effects that model has in comparative static mode discussed above
- Dynamic effects are estimated in comparative steady state model below.
- To decompose the impacts, authors run several scenarios.



Impact of WTO accession

Tariff Reform Only (no market access or FDI liberalization)

- The gains are 1.3 % of consumption.
- Standard gains from trade results
- But this also includes some productivity impacts as tariff liberalization in goods sectors subject to IRTS leads to more varieties of goods.
- Businessmen in Russia sometimes complain that the tariff in their sector will decline and project that WTO accession could adversely impact on their sector. This model supports the government's response that economy-wide (general equilibrium effects) result in many productive sectors expanding, despite tariff reduction.



Impact of WTO accession

- Tariff reduction induces a depreciation in the real exchange rate.
- The rest of the world will not provide Russia with a “free lunch,” in response to the tariff reduction i.e., the increased imports have to be paid for by increased exports. The increased demand for imports raises the prices of foreign exchange (more technically, depreciates the real exchange rate) that in turn induces an increase in exports and a decrease in the quantity of imports. The real exchange rate depreciates until the value of the increase in exports equals the value of increased imports.



Impact of WTO accession

- A reduction in the tariff on imported goods has the impact of increasing the tariff ridden demand curve for imported goods. **In imperfectly competitive sectors** (say sector X), the increase in the demand implies an increase in the difference between price and marginal costs. This creates profit opportunities for foreign firms and **induces entry** by new foreign firms.
- In addition to the productivity effect in sectors that use the output of sector X, consumers of good X are able to purchase a quality-adjusted unit of X at a **reduced price** when there are additional varieties. That is, the Dixit-Stiglitz representation of the utility of goods implies love of variety in the utility function. So the gain in utility comes not just from removal of consumption distortion triangles, but also from additional varieties in IRTS sectors.

Impact of Improved Market Access

- Authors estimate that the impact of improved market access with IRTS at 0.6 % of consumption.
 - a relatively small share of the gains.

Impact of FDI Liberalization with Endogenous Productivity Effects

- In this scenario, authors eliminate FDI barriers only (no improved market access or reduction in tariffs).
- The welfare gains to Russia are 5.2 % of consumption (or 2.4 % of GDP).
- Thus, endogenous productivity effects from liberalization of barriers to FDI in services are extremely important in explaining the gains to Russia from WTO accession;
 - in fact FDI liberalization **accounts for over 70 %** of the gains from WTO accession.

Impact of FDI Liberalization with Endogenous Productivity Effects

- When the services sectors are subject to increasing returns to scale, the Dixit-Stiglitz-Ethier formulation for the use of the service implies that all using sectors are able to obtain a quality adjusted unit of services at a **reduced price** when there are more varieties.
- Alternatively, the productivity of other inputs in the using sectors is increased when there are more varieties of the service.
- Elimination of the FDI barriers results in an **increase in the number of multinational service providers in Russia**, which **exceeds the decline Russian providers**. These results are consistent with the literature of geography of trade that suggest that availability of a diverse set of service suppliers is crucial to the growth of countries.

Impact of FDI Liberalization with Endogenous Productivity Effects

- FDI is a partial equilibrium substitute for domestic labor in several sectors but a general equilibrium **complement**.
- Multinationals use domestic labor less intensely than domestic firms. But our data show that in Russia they use mostly Russian labor.

Impact of FDI Liberalization with Endogenous Productivity Effects

- The **decline** in the quality adjusted price of business services increases the quantity demanded for business services. Moreover, the increase in total factor productivity by the using sectors (sector Y) can shift out the demand curve for business services. On balance, several business services sectors **expand** their **demand for labor**.
- This suggests that domestic lobbying interests within a service sector could be diverse regarding FDI liberalization.
- **Specific labor** in the services sector **may support** FDI liberalization even if capital owners in the sector oppose it.

Comparative Steady State Results of WTO Accession

- The principal feature is that authors allow the capital stock to adjust to its steady state equilibrium, but hold the rate of return on capital constant.
- Authors assume that the capital stock is in its initial steady state equilibrium in the benchmark dataset, but that the capital stock will adjust to a new steady state equilibrium based on a fixed rate of return demanded by investors.

Comparative Steady State Results of WTO Accession

- With comparative steady state model, authors estimate that **the gains to Russia from WTO accession are 23.6% of consumption (11.0% of GDP)**.
- WTO accession will induce an **increase in the rental rate on capital in Russia** in the comparative static model **by 4.9%**.
- In this model, there is an expansion of the capital stock in the new equilibrium until the rate of return on capital falls back to the long run equilibrium. With a higher capital stock, the economy is able to produce more output and there is more consumption.

Comparative Steady State Results of WTO Accession

- Authors emphasize, however, that this model produces an upper bound estimate of the welfare gains in the context of the model because the foregone consumption necessary to achieve the higher capital stock is not taken into account.
- But Rutherford and Tarr (2002) have shown that a fully dynamic model which incorporates Dixit-Stiglitz productivity effects, and which takes into account foregone consumption from investment decisions, could produce estimated welfare gains that are as large or larger than these comparative steady state effects.

Sensitivity Analysis

With CRTS — return of the Harberger constant — welfare gains of 1.2% of consumption (0.6% of GDP) .

Piecemeal sensitivity

- Most important parameters: A higher **elasticity of substitution between value-added and business services** (esubs) and a higher **elasticity of multinational firm supply** (etaf) both increase the welfare gains significantly.
- The elasticity of multinational and Russian firm supply (etaf, etad) is primarily dependent on the sector specific factor for each firm type (foreign or domestic). When etaf is high, a reduction in the barriers to foreign direct investment results in a larger expansion in the number of multinational firms supplying the Russian market, and hence more gains from additional varieties of business services.



Systemic Sensitivity Analysis

- Ran the model 30,000 with random parameter selection.
- only 6.4% of the solutions are below a welfare gain of 6% and that 13.0% are above a gain of 8%.



Conclusions

- This extension of a CGE modeling framework to allow for FDI in services with a Dixit-Stiglitz framework is crucial for the results.
- Authors estimate that provision of national treatment to multinational service providers would provide very substantial gains to Russia — this accounts for over 70 % of the comparative static gains.



Conclusions

- The results depend crucially on assessment that FDI in services is more highly protected than goods trade through tariffs.
- The estimates in services are based on questionnaires WB commissioned and estimates based on these data and international comparisons of the regulatory environment.
- Extensive piecemeal and systematic sensitivity analysis shows these results are robust.
- Growth effects could produce gains several multiples of the comparative static gains, but our estimates are less robust in this area.



Regional dimension of the model

- There are significant differences in income between the richest and poorest regions of Russia.
- Despite the large differences in income between the regions of Russia, 90% of the income inequality in Russia is due to within region inequality, and only 10% is due to between region differences in income.



Regional extension of the model

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- Despite the large differences in income between the regions of Russia, 90% of the income inequality in Russia is due to within region inequality, and only 10% is due to between region differences in income.



Regional extension of the model

- Extension of the static model: ten region model of Russia for the purpose of assessing the impacts across these ten regions.
- The structure of the model for each region follows the general structure of the national model of Jensen, Rutherford and Tarr.



Regional extension of the model

- In particular, regional model allows foreign direct investment in the business services sectors in each region.
- Authors also allow for imperfect competition where the sectors that use goods or services produced under imperfect competition obtain endogenous productivity effects from additional varieties of goods or services (the Dixit-Stiglitz framework).

Conclusions: regional model

Average gain in welfare as a percentage of consumption for the whole country is **7.8 percent** (or 4.3 percent of consumption);

- authors estimate that three regions will gain considerably more: Northwest (11.2 percent), St. Petersburg (10.6 percent) and Far East (9.7 percent).

- Authors estimate that the Urals will gain only 6.2% of consumption, **considerably less** than the national average.

- The principal explanation in central analysis for the differences across regions is the ability of the different regions **to benefit from a reduction in barriers** against foreign direct investment.

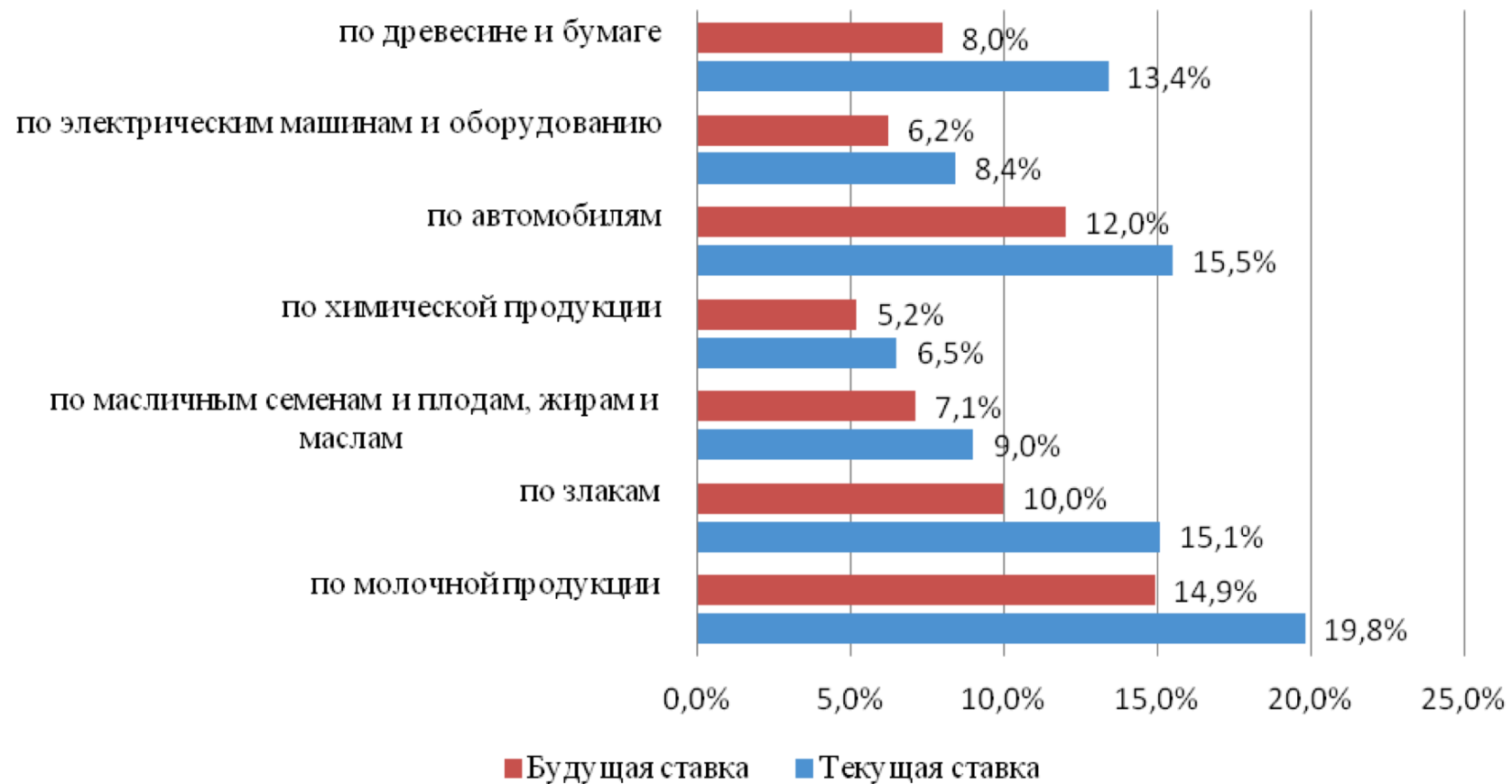


Conclusions: regional model

- The three regions with the largest welfare gains are clearly the regions with the estimated **largest shares of multinational investment**. But the Urals has attracted relatively little FDI in the service sectors.
- An additional reason for differences across regions is quantified in our sensitivity analysis: regions may gain more from WTO accession if they can succeed in creating a good investment climate.

Regional model: an update

Снижение пошлин после вступления в ВТО



Regional model: an update

	<i>Изменение потребления в ценах базового года, %</i>	<i>Изменение экспорта в другие регионы, %</i>	<i>Изменение международного экспорта, %</i>	<i>Изменение оплаты неквалифицированных рабочих, %</i>	<i>Изменение оплаты квалифицированных рабочих, %</i>
<i>Москва и Московская область</i>	0,88	0,02	0,64	0,56	0,85
<i>Санкт-Петербург и Ленинградская область</i>	0,85	-0,26	2,58	0,49	1,01
<i>Татарстан</i>	-0,03	-0,02	1,41	0,04	0,22
<i>Новосибирская область</i>	0,44	0,29	-1,54	-0,31	0,51
<i>Тюменская область</i>	-0,78	-0,17	0,41	-0,08	-0,09
<i>Дальневосточный ФО</i>	0,23	-0,02	0,28	-0,22	0,37
<i>Центральные области РФ</i>	0,32	-0,12	4,14	0,10	0,70
<i>Северо-Запад</i>	0,42	-0,27	4,30	0,24	0,77
<i>Север</i>	0,09	-0,35	1,32	-0,28	0,12
<i>Юг</i>	0,59	-0,02	1,18	0,33	0,62
<i>Приволжье</i>	0,24	-0,22	2,52	0,03	0,52
<i>Урал</i>	-0,06	-0,41	3,36	-0,20	0,41
<i>Сибирь</i>	-0,14	-0,26	1,96	-0,29	0,18
<i>Российская Федерация</i>	0,42	-0,15*	1,65	0,10	0,50

Regional model: an update

	<i>Эффективная ставка импортного тарифа 2011, %</i>	<i>Эффективная ставка импортного тарифа после ВТО, %</i>	<i>Изменения сборов импортного тарифа с учетом изменения тарифа, %</i>	<i>Изменения сборов НДС на импортную продукцию, %</i>	<i>Изменения суммарного поступления налогов на импортную продукцию, с учетом изменения импортного тарифа, %</i>
<i>Сельское хозяйство</i>	8.31	6.86	-17.48	-0.99	-2.85
<i>Добыча угля</i>	0.10	0.10	-	0.00	0.00
<i>Добыча нефти</i>	0.00	0.00	-	0.00	0.00
<i>Добыча газа</i>	3.83	3.83	-	0.00	0.00
<i>Пищевая</i>	17.62	14.80	-15.97	-2.02	-4.17
<i>Легкая</i>	16.82	12.47	-25.86	-3.72	-13.68
<i>Обработка</i>	11.83	9.67	-18.31	-2.04	-8.29
<i>Производство</i>	4.89	4.89	0.00	0.00	0.00
<i>Химическое и</i>	8.56	5.20	-39.36	-2.77	-15.31
<i>Черная металлургия</i>	3.08	2.78	-9.97	-0.29	-1.72
<i>Цветная</i>	6.44	4.72	-26.72	-1.61	-7.96
<i>Машиностроение</i>	10.79	9.27	-13.94	-1.27	-4.29
<i>Производство</i>	11.09	7.88	-30.72	-2.99	-13.80
<i>Прочие отрасли</i>	6.67	5.25	-21.29	-1.71	-7.81
<i>Производство</i>	5.00	5.00			
<i>ЖКХ и другие</i>	20.00	16.68	-16.61	-2.77	-9.42
<i>Производство</i>	25.55	12.52	-51.00	-10.91	-32.69
Всего	11.01	9.00	-18.32	-1.64	-5.52

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