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Adjustment of Conventional PSE's Methodology for Economy in Transition

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Summary

The conventional PSE's methodology doesn't provide adequate estimation of agricultural support for the economy in transition. In this paper we attempt to adjust PSE's methodology for Russian economy, and also coefficients' analysis and interpretations are adapted for transitional conditions. Investigation showed that the level of agricultural support in Russia is much lower than conventional methodology estimates.

Keywords: PSE, transition, adjusted methodology, Russia, agriculture

1 Introduction

The PSE's (producer's support estimate) methodology is used for estimating support to agricultural producers since 60-ies. OECD estimates PSE for different countries on regular basis since 1987.

This methodology gave rise to numerous discussions in recent years. By 1998 the number and complexity of policy measures in world economy increased significantly. OECD changed the methodology of estimating PSE in order to evaluate policy impact more comprehensively.

One of the main characteristics of modern world economy is that economies in transition begin to play more and more important role in it. Nowadays OECD estimates PSE not only for developed economies, but also for transitional ones. However, there are some signs of nonadequacy of conventional PSE estimating methodology for economies in transition.

In this paper we discover the imperfection of standard methodology and then we attempt to investigate the underlying conditions for conventional methodology failure to estimate support to agriculture correctly. We also attempt to adjust PSE's methodology for transitional conditions like the Russian ones, and also coefficients' analysis and interpretations are adapted for transitional economy.

A problem of estimating the efficiency of budget support to agriculture is very important at present time in Russia. It is due to the necessity of elaborating an adequate government support policy in agrifood sector.

The indicators of support like PSE are based on comparison of domestic and the world prices for an agricultural product. This method of estimation assumes, that without government interventions domestic prices would equal the world prices, in this case considered to be a sort of equilibrium prices. They are also called reference prices. And any deviation from this equilibrium is produced by government interventions. Positive value of gap between domestic prices and reference prices means support of domestic producers. Negative gap means taxation.

After the transition towards market economy began in Russia, government interventions into agricultural markets were not discontinued, though transformed significantly. Nowadays there is no direct regulation of economic activity. The aim of government regulation is the correction of economic processes in the market environment.

2 PSE estimation, standard methodology

OECD has been measuring support to agriculture in Russia using producer support estimate (PSE) since 1997. (OECD, 1998, 1999). PSE indicates all transfers to agricultural producers, both from consumers and taxpayers, arising from policy measures. It includes two components: explicit component, or budgetary payments and implicit - market price support (MPS). MPS estimates the gap between domestic prices and world (reference) prices. Domestic price is measured at farm gate and is adjusted on margin to be compared with world price.

In Soviet period support to agriculture measured by PSE was quite significant – about 80%. At the beginning of transition, PSE fell and became minus 86% in 1992. (OECD estimation). This was caused not only by the fall of government support to agriculture accompanied with imports support and export restrictions, but also by changes in macroeconomic environment and in particular by sharp devaluation of national currency and the lack of infrastructure, which stipulated gap between domestic and reference prices.

Market price support estimation based on OECD data on reference prices and Goskomstat data on domestic farm gate prices. Large enterprises, private farm and private household prices were calculated separately and then producer price was calculated as a weighted average.

When estimating PSE it is necessary to take into account on-farm feed production to avoid double counting. So, excess feed costs were excluded from livestock PSE.

Estimation of transfers to producers includes support of both domestically consumed and exported commodities. That's why Goskomstat production balances were used for PSE estimation.

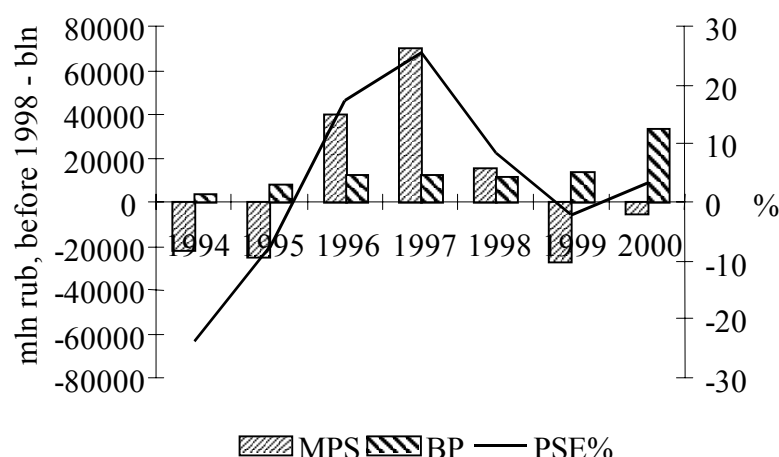
RF Federal Treasury data was used to estimate budgetary payments. (MF, 2001). To estimate PSE by commodity budgetary payments per commodity are needed. But in Russia most support programs are not tied to a single commodity, and this data is not available. That's why we estimated subsidy distribution by commodity. Budgetary payments were distributed according to the monetary value of marketed output, like in OECD methodology.

The results of own calculations of PSE for Russian agriculture are presented in FIG. 1. Bold line reflects percentage PSE in 1994-2000. The increase of PSE began in 1994 and became positive in 1996, but it never reached the level of Soviet period. PSE increase in this period can be explained by enforcement of protectionist trade measures and some shifts in infrastructure development, as well as by the overvaluated national currency. PSE fell significantly in 1998, the year of financial crisis, and recovered slightly only in 2000.

PSE increased in 1995 due to sharp growth of explicit budgetary payments. Till 1997 an overall macroeconomic situation improved and so did PSE (as can be seen in FIG. 1, MPS component reflecting macroeconomic improvements increased sharply). In 1998 after financial crisis and rouble devaluation PSE fell despite better situation for agricultural producers due to import substitution. The problem of inadequacy of PSE methodology in after-crisis conditions will be discussed in the next division.

In 1999 budgetary payments increased slightly mostly due to greater role of regional budgets in agricultural support. But MPS decreased and then PSE decreased as well. The role of MPS in standard PSE methodology increases from year to year in all countries, while the BP role usually decreases.

FIG. 1. PSE 1994-2000. Market price support and budgetary payments



Source: own calculations.

PSE by commodity can be found in TAB. 1. It can be noticed that in 1997 –1998 livestock husbandry was supported more than crop production. That's due to huge explicit budgetary payments to livestock producers during this period while main PSE component for crops was market price support, negative for crops till 1996.

Market price support reflects price gap between domestic and reference prices. It appears as a result of government price and trade policy as well as of market imperfections and the problem of large economy, counteracting price leveling on domestic and world markets. Asymmetric information, lack of infrastructure and imperfect competition (inter-regional barriers and monopoly) are examples of the above-mentioned market imperfections.

For most commodities market price support is negative, and it can't be compensated by budgetary payments that are rather small. Wheat MPS was negative till 1999 and wheat producers were taxed instead of being supported. This is a sign of inefficient budget funds' spending. Explicit budget transfers to maize producers were not large either, but maize production support is rather high due to high domestic prices for this commodity. World prices were relatively low, and that's why MPS for maize was high too. Potatoes PSE was high in 1996-1997 due to high MPS. White sugar production is supported. Other crops were taxed till 2000. In 2000 most crops became more supported and meat became less supported.

TAB. 1. PSE by commodity, Russia

	1994	1995	1996	1997	1998	1999	2000
Wheat	-57	-31	-2	8	-26	-12	8
Maize	28	21	34	31	4	13	25
Rye	-37	7	22	22	-11	-4	40
Barley	-58	-83	-9	2	-12	-36	-14
Oats	-57	-38	16	15	-8	-18	13
Potatoes	-18	-31	60	64	7	-10	-7
Sunflowers	-77	-12	-22	-30	-59	-38	-48
White sugar	-9	-0,2	21	22	37	8	26
Milk	-28	33	43	52	38	31	44
Beef and veal	-186	-89	-31	29	-7	-74	-117
Pigmeat	-56	-13	11	28	13	-3	-26

Poultry	8	31	54	65	41	40	29
Eggs	-1	36	41	51	34	0	5

Source: own calculations.

The methods of estimating agricultural support were worked out for agricultural policy analysis in developed countries to be applied in stable functioning market economy. Therefore coefficients' analysis and interpretation should be corrected taking into account the transition period specifics. In a transition economy generally accepted estimation methods are inadequate. That's why some adjustments should be made to apply this methodology in a transition economy.

3 Transition economy specifics influencing PSE estimation

There are some specifics of transition economy that make standard methodology irrelevant:

- ◆ exchange rate instability
- ◆ exchange rate nonequilibrium
- ◆ lack of market infrastructure
- ◆ technological backwardness of processing industry
- ◆ inter-regional barriers
- ◆ limited and costly information
- ◆ finance system inefficiency
- ◆ law instability
- ◆ debt write-offs
- ◆ low domestic prices as Soviet heritage
- ◆ slow market signal transmission due to the problem of large economy
- ◆ lack of reliable and comprehensive statistics

3.1 Budget transfers to agriculture

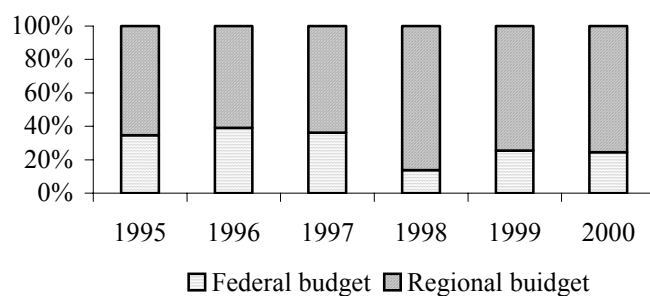
One of the transition economy problems is the lack of necessary statistical data on public expenditures on agriculture. These data need to be collected for estimating PSE, but there are some phenomena that can hardly be estimated quantitatively. It's difficult to assess the effect of credit subsidizing programs because these credits are often not paid back and so can be called grants. Thus, in 1992-1994 credits were written off. These amounts must be taken into consideration as a subsidy when estimating PSE. In transition economy budget payments to agriculture are largely delayed. This means implicit taxation of agricultural producers, especially given inflation.

Public spending on agriculture explicitly includes expenditures on agriculture and fishery, as well as land resources management. Agricultural producers' tax deductions constituted 20 mln. roubles (about 1,5% of GDP) and were not included into budget expenditures. This is not correct. Credit in-kind wasn't included either though it meant 12 trillion roubles of subsidies to agriculture due to delay of payments to the federal budget. Written-off debts in 1994-95 amounted to about 20 trillion roubles.

Budgetary payments to agriculture don't include government investments in food industry.

Essential transfers to agriculture are made from regional budgets. Federal payments constitute only about one-third (FIG. 2). And regional budgets are even less transparent. As a result of financial crisis in 1998 there wasn't enough funds for financing support in federal budget. That's why the role of regions in support grew up to 86%. In 1999 their role declined while overall support increased as compared to 1998, though it was still smaller than in 1992-97.

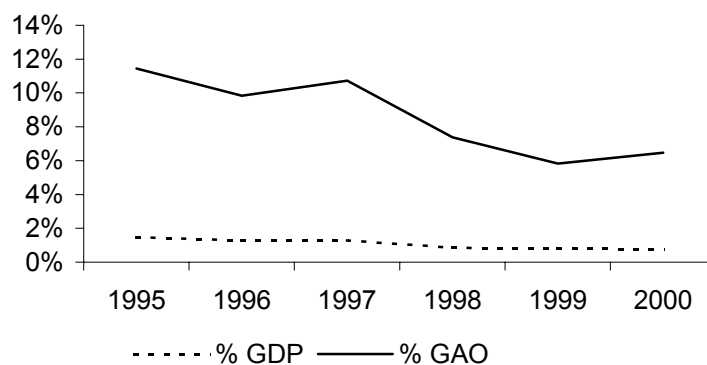
FIG. 2. The role of regional budgets in the support of agriculture



Source: Ministry of finance, Federal Treasury.

Besides, enterprises are in tax debts to budgets. As a result, information on public expenditures on agriculture is irrelevant.

FIG. 3. Consolidated budget spending on agriculture



Source: Own calculations based on Ministry of finance and Goskomstat data.

The amount of budget transfers envisaged in draft budget for agriculture is not executed. The share of budget support in GDP decreased from 4,48% in 1992 to 0,8% in 2000. (FIG. 3). Share of support in GAO reduced as well, but it rose slightly in 2000.

Services constitute large share of budget expenditures. Land resources management programs expand. In 1998-1999 about 20% of budget expenditures fell on subsidized credit fund. The amount of public investment in agriculture decreases.

The major part of budget expenditures can't be attributed to specific products, that's why PSE calculation by commodity is rather relative.

Obviously, budgetary payments to agriculture are necessary for its normal operation. However, the increase of budgetary payments rarely leads to the improvement of producers' welfare. Federal and regional agricultural policy can lead to the increase of explicit transfers to agriculture and at the same time to implicit reduction of producers' receipts or even taxation. PSE reflects this situation when budgetary payments (BP) are positive and market price support (MPS) is negative and as a result PSE is negative.

3.2 Exchange rate.

One of the transition economy's great problems is exchange rate instability. Exchange rate is used in PSE calculation for converting world prices into national currency. That's why it has direct impact on PSE calculation results. Standard methodology offers per year PSE calculations using one-year average exchange rate. In some cases exchange rates of the end of the year are used. Obviously, in a transition economy where currency rate changes significantly during the year, average rate and the end-of-the year rate are irrelevant. It would be more adequate to use exchange rates for shorter periods. For example, in August 1998 rouble was sharply devaluated and average exchange rate value didn't reflect economic processes. Thus, PSE 1998 must be calculated separately for two periods: before and after the crisis.

The second problem connected with exchange rate is national currency over- and undervaluation, or exchange rate nonequilibrium. When exchange rate undervalues national currency, world prices in national currency are overvalued and PSE shows larger taxation of agrifood sector than it really is. This situation often takes place at the early stage of transition. When national currency is overvalued PSE shows greater support.

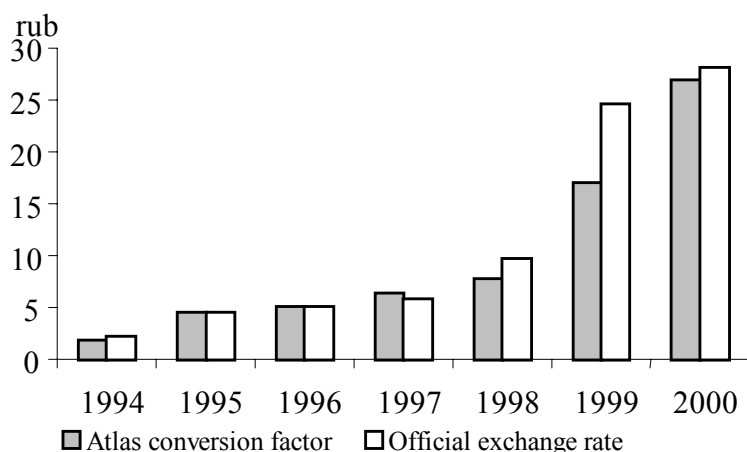
In the Soviet economy rouble was overvalued. At the beginning of transitional stage it was undervalued due to the sharp fall of its rate. Thus, in 1992 rouble's rate fell 110 times relative to USA dollar while prices rose only 2,5 times. Then in 1992-1994 high inflation rate and slower rouble devaluation led to the increase of real exchange rate that became close to equilibrium. This level remained till 1996. In August 1998 rouble was overvalued.

As a result of financial crisis real exchange rate fell significantly and after August 1998 rouble was undervalued. This leads to underestimation of support, shown by PSE. In 2000 real exchange rate was still lower than before August 1998 but it began to approach equilibrium level (FIG. 4). This makes all comparisons of support levels irrelevant for this period of non-equilibrium currency rate. World Bank uses Atlas conversion factor for equilibrium exchange rate estimations. (World bank, 2001). The purpose of the Atlas conversion factor is to reduce the impact of exchange rate fluctuations in the cross-country comparison of national incomes.

The Atlas conversion factor for any year is the average of a country's exchange rate (or alternative conversion factor) in that year and the two preceding years, adjusted for the difference between the rate of inflation in the country and that in 5 developed countries.

Official and adjusted using Atlas conversion factor exchange rates are presented in **FIG. 4**

FIG. 4. Adjusted exchange rate (RUR for USD)

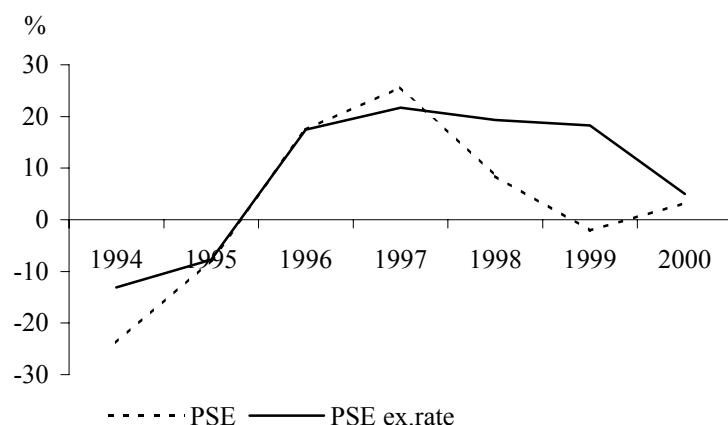


Source: CBR, World Bank.

In this investigation we calculated PSE using adjusted exchange rate. The results are on FIG. 5. In 1994 the adjusted PSE exceeds its original value, confirming the fact that undervalued national currency undervalues support. In 1995-96 adjusted PSE doesn't differ from standard PSE, because exchange rate is close to equilibrium.

Currency rate influences greatly the competitiveness of agricultural production. For example, domestic producers benefit from devaluation since their returns in national currency increase. Besides, they gain competitive advantages over imports. However, if a producer has debts in foreign currency he will partially lose from devaluation and its effect will be eliminated.

FIG. 5. PSE, adjusted exchange rate



Source: own calculations.

After the 1998 crisis Russian agricultural producers' performance improved despite the decrease of budget support. PSE calculated using standard methodology falls significantly in 1998. And it doesn't reflect changes in real support that has increased. When we use adjusted exchange rate in PSE calculations, PSE remains at the same level in 1998 and 1999 and falls only in 2000 when equilibrium exchange rate falls as well.

3.3 Margin adjustment

In the Soviet economy there was a state monopoly on agricultural output procurement. After the 1992 liberalization ties between the government and agricultural producers were destroyed and the development of market infrastructure began. However, it is still rather backward leading to higher transaction costs and lower domestic production competitiveness. As a result, the gap between domestic and reference prices can partially be explained by the lack of infrastructure.

Processing industry in transition economy is highly monopolized. This leads to overvalued processing costs for agricultural producers. High transaction costs increase producers' taxation. Technological backwardness in processing industry and bad transport infrastructure lead to the increase of transportation and processing costs for agricultural producers.

In Russia inter-regional barriers pose obstacles to exporting output produced in a region. In some regions local authorities applied quotation, licensing and total exportation prohibition. At the same time they controlled retail prices for agricultural products. Producers can't use arbitrage advantages, they can't sell on the most favorable markets. In these conditions domestic producers can hardly compete with imports. Imported goods are delivered to basic markets through highly developed distribution system. Inter-regional barriers pose obstacles to foreign trade and lead to the increase of price gap. Excessive domestic costs are also a consequence of corruption.

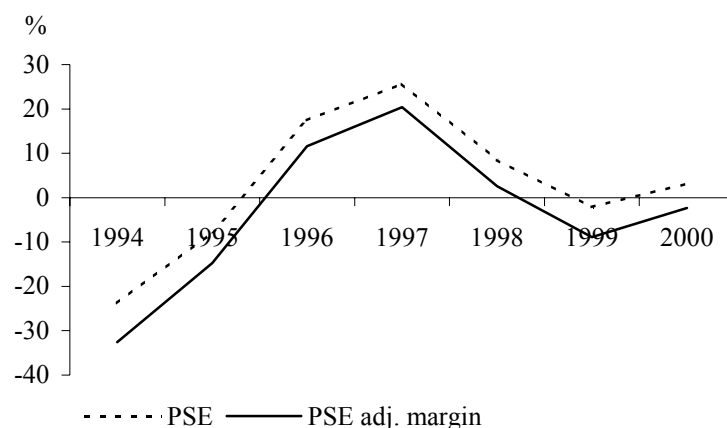
Lack of infrastructure leads to slow and costly information spreading. There is no effective financial system that could ensure fast and inexpensive access to capital. Interest rates are extremely high leading to problems with capital and investment attraction not only for agricultural producers but also for processing industry and for the economy as a whole.

Producers need effective legislation to protect their property rights. Permanent and unexpected changes in national policy, especially in foreign trade regulation, create another problem for producers. Lack of market infrastructure increases financial risks and leads to implicit producers' taxation. Lack of competition on agricultural markets leads to the widening price gap. Market prices sometimes are maintained at the level above equilibrium. In this case demand falls and some producers have to leave markets since they don't have an opportunity to sell their products. This increases risks in agriculture.

All transition problems can't be taken into account when estimating PSE but some inadequacy can be eliminated, for example by using adjusted value of margin. For calculating adjusted domestic prices, 50% margin level was taken. But in a transition economy this value includes not only processing, marketing and transportation costs, but also costs due to the lack of infrastructure – i.e. high transaction costs, bribes and many other things. Higher margin makes domestic price closer to the world price and thus, above-mentioned costs are included into the producers' support in PSE calculation. Obviously, this leads to the overvaluation of the level of support and makes inter-country comparisons inadequate. In this case higher PSE doesn't evidence better terms for producers due to the elimination of infrastructure defects. Thus, to estimate the real impact of agricultural policy on prices one needs to distinguish the part of price gap, caused by the lack of infrastructure.

One of the ways to do it is to use different margin value. In another country with transition economy, Romania, margin level is 30%. We can assume that this value is adequate for the Russian economy as well. If we use 30% margin in PSE estimation the coefficient reduces significantly and sometimes even becomes negative. In my investigation we used adjusted margin value for PSE estimation, better reflecting Russian specifics. **FIG. 6** shows PSE given 30% margin.

FIG. 6 PSE, adjusted margin



Source: own calculations.

PSE reflects the improvement of economic situation: rouble strengthening, inter-regional barriers lowering, interest rates reduction, infrastructure development. When we calculate PSE using adjusted margin of 30% we can see that support is still extremely low.

3.4 Other transition economy problems

Gap between domestic and reference prices shown by MPS can be caused not only by explicit and implicit producers' taxation but also by other factors. Agricultural policy analyses must take into account that price level in a transition economy is often lower than the world average.

This can be explained by the specifics of closed economy, where market prices were much lower than in market economies (and producer prices were highly subsidized). After price liberalization when exchange rate became closer to equilibrium, domestic prices became closer to the world prices. However, this is a very slow process, and it hasn't yet come to the end.

Thus, a part of price gap shown by PSE is conditioned not only by the national agricultural policy, but also by lower price level due to closed economy specifics.

Reference prices, used in OECD methodology, are not absolutely relevant. It would be more precise to use average export and average import prices for goods which Russia is a net exporter or a net importer correspondingly.

4 PSE adjusted. Results and analysis

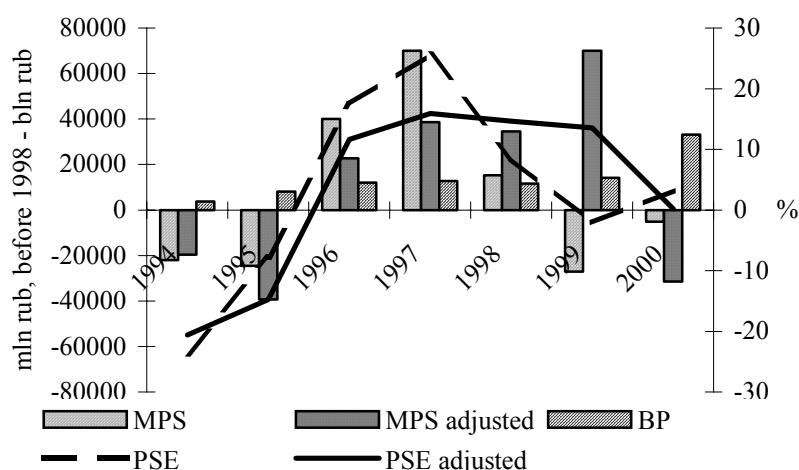
This division considers PSE adjusted on for margin and currency rate. PSE adjusted is lower than standard PSE in 1995-1997, because government support to agriculture (both MPS and BP on FIG. 7) was rather low. Standard methodology overestimates

PSE since high MPS during this period reflects not the increase of support but the overall economical stabilization.

In 1998 and 1999 standard methodology underestimates PSE due to the exchange rate nonequilibrium during this period. Rouble was undervalued and standard methodology showed the reduction of support. However, the competitiveness of domestic production and agricultural producers' performance improved after 1998 crisis. This led to MPS increase, that is reflected in higher adjusted PSE.

In 2000 PSE adjusted falls again and MPS is negative. This is the evidence that after-crisis domestic producers' advantages are ending.

FIG. 7. PSE adjusted



Source: own calculations.

In TAB. 2 we can see the results of adjusted PSE calculations by commodity. It can be noticed that for most part of commodities the situation is the same as for aggregated PSE: PSE adjusted is higher than standard PSE in 1998-1999 (due to the exchange rate adjustment) and lower in other years (due to the exchange rate and margin adjustment).

TAB. 2. PSE adjusted by commodity

		1994	1995	1996	1997	1998	1999	2000
Wheat	PSE%	-57	-31	-2	8	-26	-12	8
	PSE%adj	-55	-51	-18	-16	-16	10	-2
Maize	PSE%	28	21	34	31	4	13	25
	PSE%adj	29	9	24	13	12	31	17
Rye	PSE%	-37	7	22	22	-11	-4	40
	PSE%adj	-35	-7	10	2	-2	17	34
Barley	PSE%	-58	-83	-9	2	-12	-36	-14
	PSE%adj	-56	-111	-26	-24	-4	-8	-26
Oats	PSE%	-57	-38	16	15	-8	-18	13
	PSE%adj	-55	-60	4	-7	1	6	4
Potatoes	PSE%	-18	-31	60	64	7	-10	-7
	PSE%adj	-1	-31	60	61	26	24	-3
Sunflower	PSE%	-77	-12	-22	-30	-59	-38	-48
	PSE%adj	-74	-29	-41	-65	-47	-10	-64

White sugar	PSE%	-9	0	21	22	37	8	26
	PSE%adj	7	0	21	15	50	37	29
Milk	PSE%	-28	33	43	52	38	31	44
	PSE%adj	-26	23	35	39	43	44	38
Beef and Veal	PSE%	-186	-89	-31	29	-7	-74	-117
	PSE%adj	-182	-117	-51	10	1	-40	-140
Pigmeat	PSE%	-56	-13	11	28	13	-3	-26
	PSE%adj	-55	-29	-3	9	20	17	-40
Poultry	PSE%	8	31	54	65	41	40	29
	PSE%adj	9	23	47	55	45	52	21
Eggs	PSE%	-1	36	41	51	34	0	5
	PSE%adj	6	32	37	42	43	20	2

Sources: own calculations.

PSE changes can be caused by changes of either budgetary payments or MPS. PSE increase during the period considered and its fall in 1999 are feebly connected with the amount of budget transfers and are caused by changes of exchange rate and domestic prices. That's why in case of price and exchange rate instability in a transition economy PSE estimated using standard methodology says nothing about the real policy impact on agricultural producers.

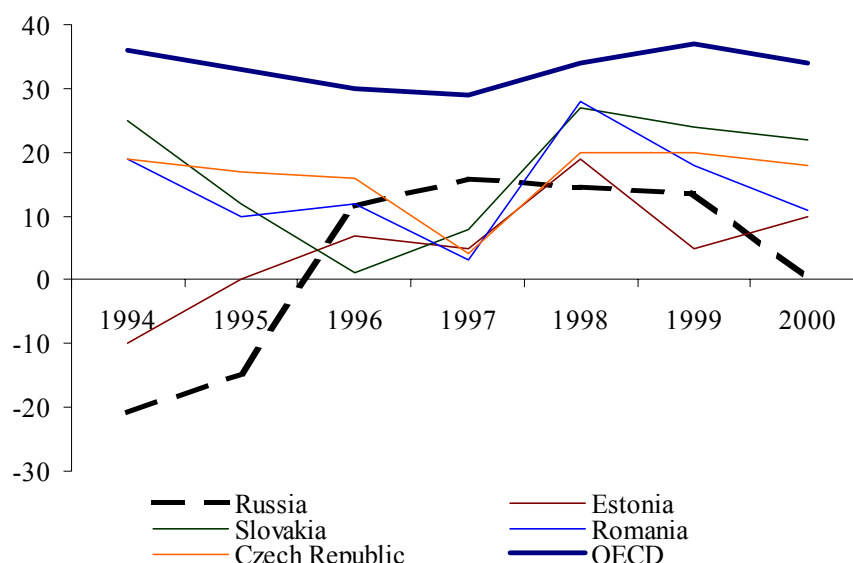
Thus, 1994-97 producers' taxation was due to unfavorable economic situation and PSE fall at the end of this period can be explained by exchange rate approaching equilibrium. The policy impact on agricultural producers was extremely insignificant and was not responsive to application of new effective policy measures.

That's why it is necessary to decrease direct government interference in agricultural sector and to reorient policy to infrastructure development, credit system improvement and creation of favorable conditions for investment in agrifood sector. It is also very important to stimulate consumers' solvent demand.

5 PSE in Russia and in other countries

The above calculations show that the real support to agricultural producers is low and for some commodities is even negative. However, it's important to estimate not only the absolute amount of support but also the respective Russia's place among other countries, especially those in transition. In FIG. 8 individual indicators for countries in transition and the OECD average are presented. (OECD, 2001). Russian PSE is adjusted for margin and exchange rate instability. In the Soviet period the level of support to agriculture in Russia was substantially higher than in the Central and Eastern Europe. At the beginning of reforms it fell sharply and became lower than in other countries. In 1997 PSE in Russia exceeded that of other transition countries, but was still below the OECD average. In 1998 the level of support in other countries increased and became higher than in Russia, where it fell again in 2000.

FIG. 8 PSE by country



Sources: OECD, own calculations.

6 Conclusions and policy implications

It can be concluded from our investigation that the actual level of agricultural support in Russia is much lower than conventional methodology reveals. Actually, in 2000 Russia's PSE is zero, and this is extremely low value compared with other countries in transition.

Consequently some conclusions can be made that are rather important for Russian relationship with other countries. Thus, zero agricultural support gains great importance considering the WTO negotiations. WTO restricts support to domestic producers, but in Russia the level of support is at the same level as in Australia and New Zealand and much lower than in other WTO members.

At the same time, the level of budget expenditures on agriculture is practically the same as in other countries. That's why it is necessary to modify the agricultural support policy in Russia, so that it would become efficient and would not lead to producers' taxation.

When budget resources are limited it is especially important to use them efficiently. But in Russia policy is rarely efficient since support programs are chosen without taking into account specific transition problems. As a result, assets are sometimes withdrawn from the agricultural sector. And the effect is often well below the funds spent on program. Therefore agricultural policy should take into account Russia's specifics. Budget funds should be spent on market institutions' development (that at present is often hampered by national policy) and property rights' guaranteeing.

It is necessary to stop direct interventions and to reduce government activity on markets since it discourages private activity in agriculture. When distributing budget funds one should take into account that low effective consumer demand for agricultural products is one of the main problems for agricultural producers. Therefore national policy should aim at output marketing development. Thus investments in food industry could increase the competitiveness of Russian agriculture. Only domestically produced goods should be used for government needs, for example army and hospitals. Domestic output should also be used in food aid programs.

Encouragement of export can also serve to increase demand. Guaranteed export credits, improvement of standardization system, government aid in commodities' promotion to foreign markets would be helpful for domestic producers.

Measures reducing production costs would also stimulate market relations' development. Macroeconomic stabilization, low and stable inflation, exchange rate stability, transparent legislation, lessened corruption will lead to agricultural sector recovery.

Direct subsidizing should be replaced by provision of general services, for example rural development support, access to information and creation of favorable investment climate. The shift to general services support would help WTO negotiations since the organization doesn't insist on cutting green box measures.

Government should support non-agricultural employment in rural areas. Nowadays almost all agricultural enterprises have redundant employees and it leads to lower labor productivity.

Another problem is the non-transparency of budget expenditures. Budget classification doesn't correspond with policy programs applied and doesn't reflect the amount of money spent on each measure of support. This makes policy impact estimation difficult. Besides, Russian budget classification is not similar to that in other countries. Thus, it is difficult to compare domestic and the world budget payments. Therefore, more detailed budget classification and better budget transparency are needed, especially for regional budgets.

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