

IMPACT OF TAX REFORMS ON THE AGRO-FOOD SECTOR: A GENERAL EQUILIBRIUM ANALYSIS FOR RUSSIA

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The consolidation of the Russian budget is one of the most urgent steps to achieve macroeconomic stability in the transition process (World Bank, 1996).

Government revenues still reached about 46 percent of the Gross Domestic Product (GDP) in 1991, but dropped to 36 percent in 1995. The deficit of the consolidated Russian budget amounted to 9.4 percent and 10.6 percent of GDP in 1994 and 1995, respectively (IMF, 1995). A significant erosion of the tax base, a poorly functioning tax administration and weak tax enforcement obviously reduced the options of the Russian government to collect urgently needed revenues in the transition period. Like other countries in economic transition, Russia reacted by introducing new taxes and by increasing tax rates in the transition period.

We argue that agriculture and food industry sectors have benefited from various tax reductions and exemptions implemented mostly by the federal government since the beginning of tax reforms in 1991 (Section 2). These exemptions can be considered as compensations for reduced direct state subsidies being implemented between 1990 and 1996. Hence, there are significant macroeconomic interlinkages between general fiscal policy issues and their impact on agriculture and the food industries. Even though these links have been addressed in the present debate about the sectoral performance of agriculture and the food industries, an analysis based on a theoretically and empirically sound mod-

ABSTRACT

A well-designed reform of the Russian tax system will be one of the decisive factors for a successful transition process. The sectoral performance and development of the agro-food sector will be strongly influenced by these policies. We describe the current structure of the Russian tax system as it has evolved in the transition period and list various tax exemptions granted to the agrofood system. Furthermore, a computable equilibrium model for Russia is described. The major objective of tax reforms in Russia is to consolidate the budget. Hence, alternative measures to consolidate the budget are simulated and their impact on agriculture and the food industries in Russia is analyzed.

RÉSUMÉ

Une bonne réforme du système fiscal russe sera l'un des facteurs décisifs pour la réussite du processus de transition. La performance sectorielle et le développement du secteur agro-alimentaire seront fortement influencés par ces politiques. Dans ce travail on décrit la structure actuelle du système fiscal russe ainsi qu'il a évolué dans la période de transition et l'on indique les différences, exemptions fiscales accordées au système agro-alimentaire. De plus, l'on décrit un modèle d'équilibre qui puisse être adopté pour la Russie. Les réformes fiscales en Russie visent tout d'abord à consolider le budget.

Dans ce but, on simule des mesures alternatives et l'on analyse leur impact sur l'agriculture et les industries alimentaires en Russie

el is still lacking. We therefore analyse some important repercussions of alternative tax measures to consolidate the budget by using a general equilibrium framework (Section 3). From the empirical result, it can be concluded that agriculture and food industries suffer from all policy alternatives (Section 3).

TAX STRUCTURE IN RUSSIA DURING THE TRANSITION PERIOD

A first comprehensive reform of the Russian tax system was implemented with the law on "The basis for the tax system in the Russian Federation" being signed by President Jelzin on December 27th, 1991. With

this law, some tax principles from western countries were introduced. In so far, the tax reform corresponded with proposals made by Hussain and Stern (1993) who recommended developing countries to adapt tax systems of western industrial countries. Such an approach would correspond to a tax share of about 30 percent from which 2/3 would be collected from income and the other third from domestic consumption taxes. However, the tax system in western industrial countries itself is the focus of criticism. Several arguments can be put forward against copying the complete tax systems of western countries (Schweickert and Wiebelt 1996): First, recommendations for tax principles in western countries are mostly the result of partial equilibrium analysis. Secondly, the creation of a tax base in transition economies is far more difficult as significant parts of economic activities are taking place in *gray markets*. Third, it is obvious that not each tax will assure sufficiently large tax revenues which are urgently needed to meet the financial needs of the governments in the transition period. A fourth reason not to adapt the tax system of western countries is their high share of income taxes. Models of the new growth theory have shown that the development of human and physical capital is decisive for

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catching-up. Furthermore, Siebert and Koop (1993) stress that the tax system of developing and transitional economies itself can become an institutional instrument in the search for international competitiveness.

The current tax reform continues reforms initiated in the pre-transition years. The goal was to replace the old tax system by income, profit, consumption by established and trade taxes as established in western market economies (Wallich, 1994). In fall 1994, the Russian government also passed a comprehensive program for the continuation of agricultural sector reforms. Among many other provisions it contained some general guidelines about the future tax policies linked to the agro-food sector. The official goal of tax policies is to stimulate domestic food production, to keep food prices at "socially acceptable" levels and to provide incentives for the sustainable modernization of food processing and stock-piling.

However, in 1997 more than 200 different taxes existed and the multitude of tax exemptions made the Russian tax system intransparent and inefficient. In the following we will give a short description of the most important taxes, their rates and the respective exemptions granted to the agricultural and food sector. All permanent residents (more than 183 days per year) are subject to *income taxes* (Wallich 1994). The tax rate varies between 12 and 60 percent. However, all newly founded private farms, known as *farmers*, are exempted from paying income taxes in the first five years. Additionally, income from sales of food produced on private household plots is exempted from income taxes. All juridical persons, including foreigners, are subject to *profit taxes*. Similar to industrial countries a tax level of 32 percent was introduced in 1993, which is higher for banks and insurance companies. Profit tax payments of firms in the agro-food sector were considerably low as firms below 200 employees selling self-made food items were exempted from paying corporate taxes since 1991. A general *Value Added Tax* (VAT) rate of 28 percent was introduced on January 1st, 1992. Even though the budget deficit increased, the VAT rate was lowered in 1993 to 20 percent. One of the most important tax advantages for the food economy in Russia is a reduced VAT rate. When the general VAT rate was lowered in 1993, the rate for food items was reduced from 15 to 10 percent (OECD, 1995). In 1995, a special additional tax of 3 and later 1.5 percent was levied on all VAT revenues in order to finance sector-specific reform policies such as credit programs for agriculture. Another source of government revenues are *excise taxes*. They contributed 5 and 3 percent to federal and regional budget revenues in 1994, respectively. Federal excise taxes are levied on alcoholic beverages, tobacco, cars and luxury goods. Tax rates vary between 14 and 90 percent. Furthermore, *trade taxes* are of increasing importance. Starting with a fairly liberal trade regime, protectionist

measures have increased. One of the most important export taxes is the one on crude oil with a tax rate of 30-40 percent. Import tariffs for food commodities have been raised continuously in the transition period. Because of the above mentioned various tax exemptions agricultural producers were supposed to be taxed with a *land tax*. However, the tax rates were set by regional governments, varied significantly and were too low to ensure significant revenues or to provide sufficient incentives to use land more efficiently (Krylatykh, Semionova, 1996). It is quite obvious that this vast number of tax exemptions granted to the agricultural and food sector have significant allocative and distributive implications. In order to address both the question which strategy the Russian government could pursue to reduce the deficit and which implications alternative measures would have on agriculture and the food sector a CGE model for Russia will be used.

THE CGE MODEL AND TAX POLICY EXPERIMENTS ⁽¹⁾

Data issues linked with compiling the first IOT for Russia

The use of CGE models for analysis of transforming economies is still in an early stage. Very often data problems are a first obstacle to follow this modeling approach. In the case of Russia, data problems still amount, because of structural changes in the economy but also because of mandatory ongoing changes in the statistical systems. In the light of these data problems, the World Bank commissioned two independent compilations of national account estimates for the republics of the FSU. One of these attempts resulted in the compilation of a 125 sectors Input-Output-Table (IOT) for 1990 which complies with the System of National Accounts format (World Bank, 1995). It has been aggregated to 17 sectors including six food industry and one agricultural sector. Furthermore, this IOT has been updated to be consistent with 1994 macro figures and consolidated government revenues and expenditures (IMF, 1995). Hence, the data base used for the CGE analysis in this article is an updated version of the 1990 IOT.

The model structure

The objective of this study is to analyze the short-and medium-run effects of fiscal reforms in Russia on several macroeconomic and sectoral indicators with an explicit focus on food industries. The effects of discretionary policy measures are difficult to identify in time-series models. A more promising alternative is to stick closely to microeconomic theory confining the analysis to comparative statics. A modelling approach well-suited for such an analysis is a computable general equilib-

(1) The model is described in more detail in Wehrem, Wiebeelt 1997.



rium (CGE) model. The behavioral equations of the Russian CGE model are derived from microeconomic theory. The model is based on a Social Accounting Matrix (SAM), which represents the full circular flow of money, factors and commodities in the Russian economy. Labor and capital are the *primary factors* modelled, with labor mobile and capital immobile in the short run and mobile between sectors in the long run. Producers minimize their costs under the conditions of a neoclassical (Cobb-Douglas) production function, consumers maximize their utility subject to an aggregate expenditure restriction and based on an additive (Cobb-Douglas) utility function. Supply, demand and trade are thus determined by changes in relative prices and substitution possibilities between factors of production, between different commodities in demand and, for individual commodities between imports and domestically produced imperfect substitutes in domestic demand and between export supply and domestic supply in production. Export demand is price elastic. World market prices are exogenous, import and export prices depend on world market prices, tariff rates and the exchange rate. Factor income is distributed to capital owners and workers; total savings comprise households

savings, depreciation, government budget surpluses and foreign savings. Total government revenues accrue from trade taxes, excise taxes, value added taxes, factor taxes and income taxes. Fiscal measures are introduced by fixing sectoral tax rates. Households and government demand for all sectors is determined using fixed expenditure shares and fixed shares of aggregate real spendings, respectively; budget surplus is defined as the difference between revenues and government demand for goods; changes in stocks and real investment are determined using fixed shares; the GDP-deflator is fixed. Supply-demand balances define sectoral market clearing conditions for product and factor markets; macroeconomic equilibrium is maintained between savings and investments as well as for the balance of payments. The solution of the model simulates the impact of fiscal measures on all endogenous variables. Alternatively, target figures, such as a specific budget deficit can be fixed with the solution, for example, yielding the necessary expenditure cuts.

The model is specified differently for the short- and medium-run analysis. In the short-run sectoral capital stocks are fixed. As a result, changes in prices for outputs, intermediates and factors yield sectorally different

profit rates. In the medium-run, intersectoral capital movements will lead to an equalization of sectoral profit rates. Also, nominal wages are fixed in the short-run and employment is determined by demand. Over time, real wages adjust to meet employment targets. Finally, substitution possibilities between imported and domestically produced commodities and between exported and domestically sold commodities are limited in the short-run. Additionally, exports can be sold on the world market only with considerable price concessions. In the medium-run, however, substitution and export demand elasticities are higher.

Model results

Six short- and medium-run experiments were simulated in order to analyze the impact of alternative fiscal policies. In each case the magnitude of policy intervention has been calibrated to yield a 30 percent reduction of the fiscal deficit. The experiments differ with respect to the policy approach chosen to achieve this objective. In the short run an expenditure contraction (exp.1), and an increase of excise (exp.2) and income taxes (exp.3) have been simulated. An increase of excise (exp.4) and

income taxes (exp.5) are repeated under medium run assumptions. Additionally, an equalization of sectoral corporate taxes is simulated in the medium run (exp.6). The simulation results (**table 1**) suggest that, in the short-run, increasing income taxes are superior to expenditure contraction or increases of excise tax rates. The contractive overall effects on the Russian economy induced by reductions in demand (in the case of expenditure cuts) or an increase in production costs (in the case of higher excise taxes) can be circumvented when income taxes are increased.

Agriculture and the food industries would experience production and income losses under all three simulated options for the reduction of the budget deficit. The recessive effects for these sectors would be lowest in the case of expenditure cuts. An increase of income taxes would affect output in these sectors more negatively because of significant reductions in the private demand for the goods produced by these sectors. Higher excise taxes instead would increase production costs and affect such food industries most severely which are highly dependent on intermediates (e.g. meat and dairy-processing, flour-milling). Because of import competi-

Table 1 Short-run and medium-run effects of fiscal adjustment (changes in percent).

Variable	Short-run effects			Medium-run effects		
	Tax reform			Tax reform		
	Expenditure cuts	Higher excise taxes	Higher income taxes	Higher excise taxes	Higher income taxes	Equalization of sectoral corporate tax rates
	Experiment 1	Experiment 2	Experiment 3	Experiment 4	Experiment 5	Experiment 6
Macroeconomic effects						
Consolidated government deficit	-30.0	-30.0	-30.0	-30.0 (EX)	-30.0 (EX)	-30.0 (EX)
GDP	-0.8	-2.5	0.5	0.3	0.1	1.4
Employment	-1.4	-5.3	1.0	0.0 (EX)	0.0 (EX)	0.0 (EX)
Wage rate	0.0 (EX)	0.0 (EX)	0.0 (EX)	-2.7	0.7	1.5
Real exchange rate	1.7	-5.0	0.3	0.3	-0.1	-0.2
Government consumption	-15.0 (EX)	0.0 (EX)	0.0 (EX)	0.0 (EX)	0.0 (EX)	0.0 (EX)
Investment	14.3	7.9	10.2	9.7	9.4	13.3
Trade balance	0.0 (EX)	0.0 (EX)	0.0 (EX)	0.0 (EX)	0.0 (EX)	0.0 (EX)
Exports	0.4	-3.8	-0.0	1.5	0.3	7.8
Imports	-0.0	0.0	-0.0	1.4	0.2	8.4
Sectoral output						
Agriculture	-0.4	-5.5	-1.3	-7.5	-4.0	-20.0
Food industry of which	-1.1	-8.3	-1.9	-11.6	-4.6	-13.1
Sugar refineries	-0.8	-5.0	-1.1	-11.2	-4.4	-11.8
Grain mills	-1.4	-8.4	-2.1	-10.1	-4.6	-15.1
Meat processing	-1.8	-12.0	-2.8	-14.3	-5.0	-13.6
Dairies	-1.5	-9.4	-2.2	-12.5	-4.7	-11.8
Other food industries	-0.7	-6.8	-1.6	-11.5	-4.6	-10.3
Animal feed processing	-0.2	-5.8	-1.0	-7.9	-3.9	-21.5
Other manufacturing	1.4	-2.9	0.7	1.5	0.9	6.1
Construction	10.8	6.4	8.0	11.7	9.3	12.7
Trade & transport	0.0	-4.6	-0.8	-1.1	-1.5	2.5
Other services	-8.3	-2.9	-1.0	-0.6	-1.3	0.1
Notes: EX = exogenous. Source: Own calculations.						

tion, these higher costs could not be passed on to consumers via higher prices.

In the medium-run, the adjustment of sectoral capital stocks and factor prices result in moderate output increases of the Russian economy. In contrast to the short run results increasing excise taxes would yield positive results for the whole economy in the medium run. In the short run the real appreciation induced an overvaluation of domestic production factors. This overvaluation can be accommodated for in the more flexible economy by decreasing real wages which again induces an increase in domestic production. It also becomes evident that this output increase is absorbed mainly by the world market. In contrast to other sectors (e.g. construction and other manufacturing), an increase of excise taxes results in stronger output contraction in the medium run for agriculture and the food industries. Higher input prices are not offset by lower factor costs. As substitution possibilities in the medium run are higher, domestic demand substitutes domestically produced food products by relatively cheaper imports. Indeed, this mechanism can explain some of the recessive effects observed in the Russian food sector during transition which was in most years even stronger than in the general economy: relatively weak adjustments of factor costs despite higher prices for intermediates as well as strong competition from imports are two of the most obvious problems of the Russian food industries.

In contrast to higher excise taxes an increase in income taxes would not discriminate between different sectors. However, sectors for which the share of household expenditures is larger are hit more severely. In agriculture and in the service sector this reduction of demand is partially compensated by increased investment demand. The major share of this additional demand for investment goods is absorbed by construction and machinery which, therefore, experience an output increase. Generally, higher income taxes result in a reallocation of production from agriculture, and food industries and services to other manufacturing and construction.

As shown in chapter 2, the current tax system in Russia contains many tax exemptions for the food sector. The far reaching exemptions from corporate taxes, for instance, discriminate against other sectors. In order to show their macroeconomic impact an equalization of sectoral corporate tax rates was simulated with experiment 6 even though food sector lobbyists in Russia are likely to oppose such a step strongly. As expected, this policy alternative to reduce the budget deficit would lead to most dramatic reductions in the output of food industries and agriculture. At the same time, substantial efficiency gains in other sectors drive an overall positive result of this alternative. This result is mainly due to the success on the export market. The equalization indirectly results in lower prices in non-food sectors and

thus increases their competitiveness in world markets. In agriculture and the food industries the production costs are increased which results in strong reduction of export demand.

CONCLUSIONS

The case analysis of alternative fiscal reforms to consolidate the Russian public budget suggested that, both, expenditure cuts and tax reforms do have a significant and generally negative impact on agriculture and food industries. Indeed, such recessive effects have been observed in the Russian food sector during the past transition. In the model economy this relative decline can - among others - mainly be traced back to the restructuring of final demand towards investment which mostly benefits construction and other manufacturing whereas agriculture and food industries suffer from decreasing private and/or public consumption

Hence, important repercussions of macroeconomic reform alternatives for the food sectors could be identified by using a general equilibrium approach. However, the empirical reliability of such a CGE analysis could be improved substantially if a more recent IOT for Russia is available, if capacity effects are modelled in a dynamic version of the model, and if sectoral policies which currently discriminate against specific food industries are included in a comprehensive fiscal reform package for Russia. ●

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