



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

האוניברסיטה העברית בירושלים  
The Hebrew University of Jerusalem



המרכז למחקר בכלכלה חקלאית  
The Center for Agricultural  
Economic Research

המחלקה לכלכלה חקלאית ומנהל  
The Department of Agricultural  
Economics and Management

**Discussion Paper No. 15.08**

**Farm Debt in Transition:  
The Problem and Possible Solutions**

by

**Zvi Lerman**

Papers by members of the Department  
can be found in their home sites:

מאמרים של חברי המחלקה נמצאים  
גם באתרי הבית שלהם:

<http://departments.agri.huji.ac.il/economics/indexe.html>

P.O. Box 12, Rehovot 76100

ת.ד. 12, רחובות 76100

# Farm Debt in Transition: The Problem and Possible Solutions

Zvi Lerman

*Department of Agricultural Economics and Management  
Faculty of Agriculture, Food, and Environment  
The Hebrew University of Jerusalem*

November 2008

# Farm Debt in Transition: The Problem and Possible Solutions<sup>1</sup>

## Table of Contents

### PART A. COTTON DEBT IN TAJIKISTAN

- A.1. The financial crisis in Tajik agriculture
- A.2. Policies to address debt accumulation in Tajikistan
- A.3. Farm debt as an obstacle to farm restructuring

### PART B. FARM DEBT IN CIS

- B.1. Nature of farm debt and repayment capacity
- B.2. Debt and profitability
- B.3. External factors affecting profitability: The impact of government policies
- B.4. Who are the farms' main creditors?
- B.5. Is farm debt secure?
- B.6. What can be done to resolve the farm debt problem in CIS countries?
- B.7. Farm debt resolution program in Moldova (1998-2000)

### PART C. FARM DEBT CRISIS IN ISRAEL

- C.1. Cooperative structures in Israeli agriculture
- C.2. Financial intermediation
- C.3. Inflation and negative interest rates
- C.4. The crisis
- C.5. The debt settlement
- C.6. Lessons and recommendations based on Israeli experience

### CONCLUSION

---

<sup>1</sup>**Part A** of this note draws on the EC/FAO report *The Economic Effects of Land Reform in Tajikistan* (October 2008). The report was prepared as part of the EC/FAO Food Security Programme—Phase II: Food Security Information for Action and published in Budapest and Dushanbe (in English and Russian).

**Part B** is based on data provided by counterpart teams in five CIS countries that participated in the World Bank regional farm debt study in 1999-2000: Belarus, Kazakhstan, Moldova, Russia, and Ukraine. The analysis of Leningrad and Novgorod oblast data was carried out by Yulia Rabinovich as part of her graduate work at the Hebrew University in Israel. The results of the multi-country analysis for CIS were published as a World Bank discussion paper (Z. Lerman, C. Csaki, and S. Sotnikov, *Farm Debt in CIS: A Cross-Country Analysis*, World Bank, Washington, DC, 2001) supported by detailed country background papers.

**Part C** draws on the work carried out between 1988 and 1992 by Yoav Kislev, Zvi Lerman, and the late Pinhas Zusman at the Hebrew University in Israel (with partial support from the World Bank's Agriculture and Rural Development Division), analyzing the farm debt crisis in Israel. It relies on a number of publications in English and Hebrew that grew out of this work (specifically, Y. Kislev, Z. Lerman, and P. Zusman, "Recent Experience with Cooperative Farm Credit in Israel," *Economic Development and Cultural Change*, 39(4):773-789, July 1991; and Y. Kislev, Z. Lerman, and P. Zusman, "Cooperative Credit in Agriculture - The Israeli Experience," in: K. Hoff, A. Braverman, and J. Stiglitz, *The Economics of Rural Organization: Theory, Practice, and Policy*, Oxford University Press, New York, 1993, pp. 214-227) and also draws on unpublished materials written by Yoav Kislev in 2001 regarding the experiences with agricultural cooperatives in Israel.

The purpose of this report is to inform the debate around the issue of cotton farm debt in Tajikistan by describing the experience of other countries that had to contend with farm debt overhangs in the 1980s and the 1990s. The countries described in the report are five CIS transition countries (Belarus, Kazakhstan, Moldova, Russia, and Ukraine) and one market economy (Israel). The discussion will show that the farm debt issue is not strictly a transition economy phenomenon. The problem can occur in market economies, if the state pursues policies directed toward the expansion of farm production without heed to creditworthiness of the farms. The basic reasons that led to debt accumulation in CIS and in Israel remain valid to this day, and the policy solutions implemented in these countries are relevant for Tajikistan.

The accumulation of farm debt in Tajikistan is an outcome of a long list of persistent problems, but the major issues that have clear parallels in the experience of other countries are easily identified:

1. Insufficient profitability of the farms;
2. Inappropriate organizational structure of the farms;
3. Pervasive government intervention in financing decisions, leading to soft budget constraints and moral hazard;
4. Lack of transparency in accounting for outstanding debt and accrued interest charges.

The discussion that follows will trace the responsibility of these four major issues for farm debt accumulation in transition and market economies alike.

An important common feature of farm debt in both transition and market economies – CIS and Israel – is that the problem encompassed a whole economic-social sector in each of the countries involved. As a result, it was unpracticable to seek standard debt resolution through liquidation and bankruptcy of the insolvent farms, as the entire agriculture was insolvent and traditional approaches would involve an unacceptable social cost for the rural population as a whole. The situation in Tajikistan may not have reached this dramatic level yet, but the farm debt burden is large and widely dispersed. The search for farm debt resolution mechanisms in Tajikistan therefore should purposely consider non-bankruptcy mechanisms that will help preserve and nurture the fragile fabric of rural society.

The paper starts with a brief overview of the farm debt situation in Tajikistan (section 1) and a conceptual discussion of the obstacles to farm restructuring created by farm debt; then we proceed to discuss in depth the problem of farm debt and the attempted solutions in the CIS (sections B.3-B.8) and Israel (sections C.1-C.6). It is important to stress that our entire analysis is constructed “bottom-up”: we do not examine the banking system and its mechanisms for financing farms (if any). Instead we focus on farm performance and its direct responsibility for debt accumulation. We are convinced that if farms start performing in a satisfactory manner, further accumulation of debt will cease due to generation of retained earnings. It will then be only necessary to resolve the problem of past debt – an important and difficult task, but certainly closed-ended and manageable.

## **PART A. COTTON DEBT CRISIS IN TAJIKISTAN**

We trace the accumulation of cotton farm debt in Tajikistan to pervasive government intervention in both financing and production decisions. In addition, the government failed to create a conducive environment for radical restructuring of the inherited farm system and thus prevented improvements in profitability and efficiency, which made debt accumulation inevitable. Despite its generally interventionist behavior, the government ultimately has not taken decisive steps to resolve the farm debt crisis and has not implemented its own resolutions that could have alleviated the situation.

### **A.1. The financial crisis in Tajik agriculture**

Agricultural enterprises and collective dekhkan farms in Tajikistan currently face a severe debt crisis. Although the debt crisis is best documented for cotton farms, it is a general problem of the structurally unreformed sector of agriculture. The debt crisis in Tajikistan's agriculture has been caused by a combination of two factors typical of such situations in many countries: (a) the inability of the farms to make a profit under current conditions and (b) continued lending by the banks to cotton producers regardless of reduced payment capacity and lack of credit-worthiness.

The financial performance of agricultural enterprises in Tajikistan has deteriorated drastically over time. In aggregate agricultural enterprises in Tajikistan have run net losses since 1998, with the one exception of 2001 (**15Years, pp. 478-479**). According to official figures, the number of corporate farms (enterprises) reporting losses in Tajikistan increased from 27% in 1997 to 51% in 2001 (**AgYB, 2002**). Despite worsening economic performance, bank lending to agricultural enterprises has increased every year since 1991, so that their share in total bank debt in the economy rose from less than 10% in 1991-93 to more than 60% in 2002-05 (**15Years, pp. 473-474**). Almost the entire bank debt in farms (more than 95%) is short-term debt for working capital financing. In addition to short-term bank debt farms are also indebted to input suppliers, which have accounted for more than one-third of farm debt in recent years. Thus, in 2005, farms owed 500 million somoni in accounts payable to suppliers on top of 750 million somoni that they owed to the banks (**15Years, p. 485**), approximately 400 million US dollars.

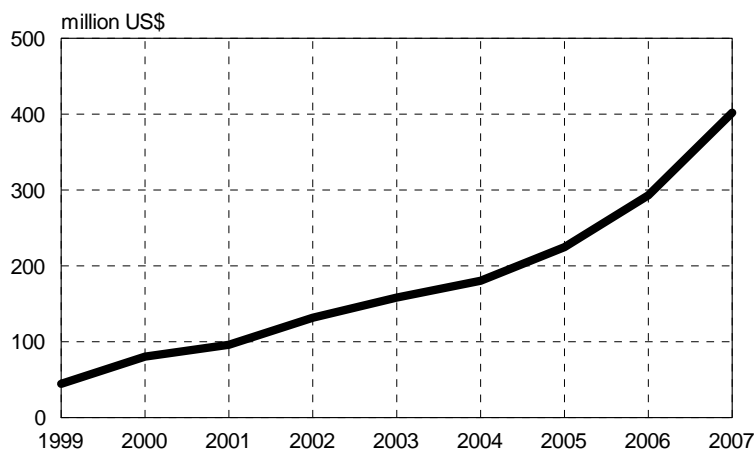
The debt issue has been primarily analyzed for agricultural enterprises and collective dekhkan farms producing cotton. The system for funding the cotton crop was set by Presidential Decree 369 in September 1998. It was designed with the objective of alleviating the working-capital difficulties of cotton-growing farmers. Private investors ("futurists") were to conclude tripartite contracts with a farm and with Agroinvestbank. The contracts were to specify what inputs they were to supply to farms and the amount of cotton they would receive for their services. Agroinvestbank supplied the funds with which the inputs were to be purchased and in return was given the monopoly right to allow cotton to be exported, presumably in order to ensure that all debts to it were paid.<sup>2</sup>

---

<sup>2</sup> In 2003, the procedure was changed so that farms could deliver seed cotton rather than cotton lint to the investors and the Agroinvestbank's monopoly role was eliminated. This did not affect the essential features of the mechanism.

It has been repeatedly argued that “investors” grossly overcharged farmers for financing and inputs delivered, and underpaid for cotton received. These pricing problems combined with intrinsically inefficient production led to steady increase of indebtedness.

The debt of cotton farms to private investors increased steadily and continuously from less than \$50 million in 1999 to \$400 million in the end of 2007 (**Figure 1**).<sup>3</sup> In addition, farms have debt to the budget, tax authorities, and for utilities. According to the National Bank of Tajikistan, this non-investor debt totaled approximately \$62.2 million as of January 2006, but only after the government had written off \$38.5 million in December 2003 under government resolution 542.<sup>4</sup> In total, the farm debt to investors and non-investor creditors accumulated by January 2006 was about equal to the total amount the World Bank and the Asian Development Bank, taken together, had lent and given Tajikistan since they began operations in the country.



**Figure 1.** Debt of cotton-growing farms to investors, 1999-2007

Recent survey results illustrate that the primary source of financing for cotton producers is the “futurists,” non-bank private financiers that advance farm inputs in exchange for the cotton crop. Practically all cotton growers among family dehqan farms (90%) sign forward contracts for cotton deliveries, and again practically all of them (83%) sign up with “futurists” (**FAO 2008**). For small farmers investors (“futurists”), financed (sometimes in combination with other sources) about 70% of the production costs for the 2007 cotton harvest (**Table 1**). Commercial banks contributed another 12% of production costs, while 14% was self-financing. Most farmers (72% of the respondents) used a single source of financing, which in more than half the cases was the investor. Self-financing is the second-ranking source, reported by 30% of farmers who finance from a single source (**ADB 2008**).

<sup>3</sup> Van Atta, Don (2008): “The failure of land reform in Tajikistan,” Paper for the 13th Annual World Convention of the Association for the Study of Nationalities, Columbia University, New York (April 11). Based on data from IMF (1999) and National Bank of Tajikistan (2000-2007).

<sup>4</sup> EuropeAid Project on Support to the Development, Implementation and Evaluation of Agricultural Policy of the Republic of Tajikistan, “Notes for a Strategy for the Agricultural Sector of Tajikistan” (processed, 2007), pp. 29, 49, 50.

**Table 1. Cotton financing sources for small farmers in 2007**

Financing source	Share of 2007 production costs financed from this source, % (n=323)	Farmers resorting to this source, % (n=323)*	Farmers financing from a single source, % (n=233)
Investors	68	62	54
Banks	12	14	11
Self-financing	14	46	30
Other	6	9	5
Total	100	--	100

\*Numbers add up to more than 100% because farmers use multiple sources of financing.

Source: ADB 2008.

For farmers with a *single source of financing*, investors are the leading source contributing 71% of production costs, with commercial banks trailing far behind with a 15% share (**Table 2**). Among farmers with *two sources of financing*, investors retain their dominant role (59% of production costs), but it is self-financing that emerges as the second most important source (30% of costs). Banks are in third place with an 8% share for this of farmers with diversified financing.

**Table 2. Share of production costs financed from different sources (percent of 2007 cotton harvest)**

Financing source	Farmers financing from a single source (n=176)	Farmers financing from two sources (n=72)	Farmers financing from three sources (n=8)
Investors	71	59	69
Banks	15	8	4
Self-financing	8	30	15
Other	6	3	12
Total	100	100	100

Source: ADB 2008.

In general, larger farms have to turn to investors at least for part of their financing, while the smaller farms rely on self-financing. Among farmers with a single source of financing (**Table 3**), those with least land (11 hectares under cotton) rely on self-financing, while those with most land (46 hectares under cotton) finance through investors (the differences between the two extreme groups are statistically significant). The same general tendency is observed when we compare the area in all farms that use investor financing (whether as a single source or as one of multiple sources) with the area in all farms that use self-financing: the average land under cotton in investor-financed farms is 44 hectares, while the average land under cotton in self-financed farms is 20 hectares (bank-financed farms fall in the middle with 40 hectares).

To summarize, there are two main reasons for lack of profitability and the accumulation of debt among cotton farms— primarily collective dehkan farms, but also many of the remaining farm enterprises: inefficiency due to inadequate reorganization and continued lending by “futurists” to farms irrespective of the ability of farms to service debt. The government’s insistence on setting targets for cotton production (so-called “state orders”) is a major reason for both lending without due regard to debt repayment capability and an incentive for farms to use the services of “futurists”. The state deprived Tajik farmers of freedom of choice in decisions involving the product mix on their farms, locking them into a rigid cropping and production pattern. Charged with the responsibility of meeting



state orders for cotton, district authorities (hukumats), in addition to enforcing cotton sowing targets, began to demand that farmers accept financing by private “investors” outside the banking system in the guise of alleviating working capital problems. The dehkans had to comply with these “recommendations” because the hukumats have the power to confiscate land for “irrational” use (which includes non-compliance with state orders).

**Table 3. Relationship between financing modes and land**

	Area in cotton, ha	Total cropped area, ha
Single financing source	33	48
Multiple financing sources	36	64
For farms with a single financing source:		
Investor	46*	64*
Bank	30	39
Self-financed	11*	19*
All financing sources:**		
Investor	44	67
Bank	40	76
Self-financed	20	33

\*Difference between investor-financed and self-financed farms statistically significant by both Anova and Wilcoxon tests.

\*\*Differences cannot be tested for statistical significance because of data structure.

Source: ADB 2008.

## A.2. Policies to address debt accumulation in Tajikistan

Several decrees and resolutions have addressed the problem of cotton farm debt since 2003 (**Table 4**), proposing to no avail debt settlement mechanisms, appropriate accounting techniques, and timetables for debt rescheduling and repayment. The growing farm debt problem stimulated the government of Tajikistan to issue Government Resolution 111 entitled a “Plan of Measures for Cotton Farm Debt Resolution in the Republic of Tajikistan for 2007-2009.” This resolution included policy measures aimed at creating a better enabling environment for cotton producers, such as a provision prohibiting district authorities from confiscating land for use “not according to purpose” and provisions guaranteeing no interference in farmers’ freedom to farm. The document also called for the “design [of] procedures on farm debt resolution” by April 2007.

**Table 4. Cotton debt resolution decrees**

Date	Document	Title
April 15, 2003	Presidential decree No. 1054	“On the mechanism for settling the debts of reorganized agricultural enterprises and enterprises undergoing reorganization”
December 23, 2003	Government Resolution No. 542	“On settling the debt of reorganized agricultural enterprises and enterprises undergoing reorganization”
March 4, 2005	Approved by the President	Strategy for cotton farm debt resolution in Tajikistan
June 30, 2006	Presidential Decree No. 1775	“Rule for reorganizing and reforming agricultural enterprises”
March 5, 2007	Government Resolution No. 111	“Plan of measures for cotton farm debt resolution in Tajikistan for 2007-2009”

The enabling measures outlined in Government Resolution 111 have not been fully enacted and no procedures to resolve the problem of farm debt have been issued so far. In fact, many of the provisions of Resolution 111 are effectively abrogated by the latest version of the Law “On Land Use Planning” passed in January 2008. An interventionist streak runs through the entire law indicating that the government intends to continue its intervention in farm-level production decisions through the tools of land use planning.

### **A.3. Farm debt as an obstacle to farm restructuring**

The main goal of the agricultural transition agenda in Tajikistan and the rest of the post-Soviet space is to move toward a market-oriented agriculture, improving productivity and efficiency of resource use. This requires a radical change in farm structure and operation, as the successors of large collective and state farms differ radically from the farms that actually exist in market economies. Hence the persistent emphasis that the international experts have placed, since 1990-91, on the need for deep internal restructuring of the existing farms in the interest of achieving higher productivity and improving the living conditions of the rural population.

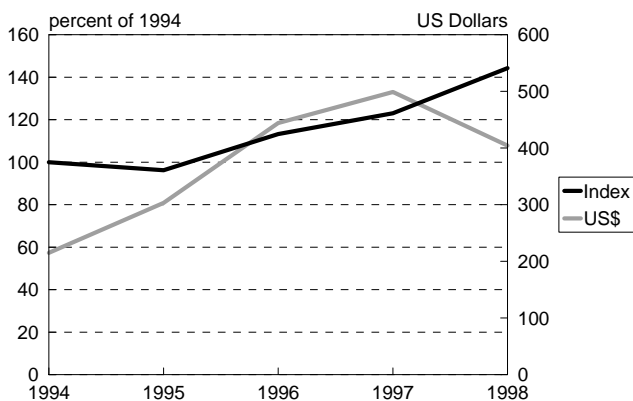
Viewed in the context of these goals, farm debt is a serious constraint for the implementation of meaningful restructuring and resource privatization in CIS agriculture in general and in Tajikistan in particular. First, it prevents the exit of individual farm members from the collective structure, because they are responsible for a portion of the debt and may not be able to borrow on their own through financial institutions to meet the operating needs of their new farms. Second, debt obstructs restructuring of the traditional collective enterprises into new viable entities, because the designated shareowners – the members of the farm enterprise – face uncertainty regarding the net value of the assets they potentially control and thus the creditworthiness of the new legal entities being created from the collective.

## PART B. FARM DEBT IN CIS

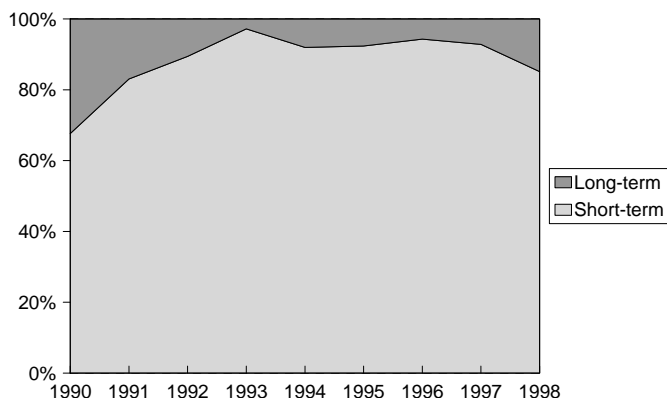
The rapid accumulation of farm debt in Tajikistan since 1999-2000 looks like a repetition of the previous scenario that unfolded in other CIS countries between 1992 and 1998. The following discussion of the development of CIS debt and the proposed solutions is intended as an experience-sharing exercise for Tajik decision makers. As in Tajikistan, farm debt accumulation in other CIS countries was driven by two main factors: (a) inadequate farm profitability and (b) pervasive soft budget constraints made possible by government policies and irresponsible lender behavior.

### B.1. Nature of farm debt and repayment capacity

The farm debt situation in the CIS has two characteristic features: first, the real debt of the farm sector rose steady since 1990 (**Figure 1**); second, the term structure of debt shifted almost entirely toward short-term, current liabilities (**Figure 2**). The old long-term debt, never a major component of farm liabilities, was completely wiped out by the galloping inflation of the early 1990s, and in the absence of appropriate indexation mechanisms all sources of new long-term lending evaporated at that time. The growing farm debt in the region is thus generally new and fairly recent debt, not debt inherited from the Soviet period.



**Figure 2.** Real debt per farm (volume index and US dollars).



**Figure 3.** Term structure of farm debt.

Western scholars analyze farm debt and detect potential debt-related problems by calculating various financial ratios based on the balance sheet and the income statement. The standard ratios calculated for the CIS countries in the course of this study certainly reveal a deterioration of financial situation over time as debt levels are seen to increase, but the values obtained for most of these ratios are not dramatically high. Thus the ratio of debt to total assets and even the ratio of debt to current assets are both comfortably less than 1 (**Table 5**). This means that, in conventional terms, the CIS farms are not bankrupt at all: they have enough assets (even only current assets) to cover the outstanding debt with a sufficient safety margin. The ratio of debt to sales measuring the ability to repay debt from current revenues is not alarming either (**Table 5**): farm debt is of the order of annual sales, which means that one year of sales revenues is sufficient to repay the entire farm debt in CIS. Debt levels of one credit-year are not regarded as catastrophic anywhere in the world. Of course, the numbers in **Table 5** are based on sector averages for each country, and do not allow for the distribution of farms over the entire spectrum of ratios. Yet tentative distributional analyses carried out by the counterpart teams indicate that the percentage of farm enterprises with critically high indebtedness levels (measured relative to assets and sales) is on the whole very low.

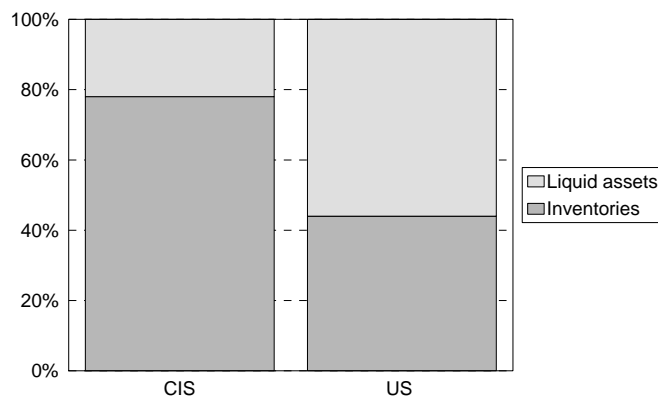
**Table 5. Selected financial ratios: Average for CIS-4**

	1990	1994	1998
Debt to sales	0.16	0.49	1.20
Debt to total assets	0.10	0.17	0.15
Debt to current assets	0.28	0.60	0.89
Debt to liquid current assets	0.58	2.27	4.27

The situation in the CIS farm sector, however, is not really amenable to the application of standard financial ratios. The rationale behind the ratio of total debt to total assets is that the assets can be liquidated at near their balance sheet value to repay debt. This is a valid assumption in market economies, where fixed assets are usually reported in the balance sheet at their historical value (net of depreciation), which is substantially below the current replacement or market value of the assets. Therefore, even when companies and creditors allow for the fact that during liquidation the assets sell at a deep discount, the realized value of fixed assets makes a substantial contribution to debt repayment. In CIS farms, the fixed assets are periodically revalued upward by indexing to various components of price inflation, and their reported book value appears to be grossly overestimated. In other words, there is no chance that the fixed assets of CIS farms will ever be realized at anywhere near their balance sheet value. As a result, the comfortable debt to assets ratios of CIS farms are totally misleading.

The problem of asset values is especially acute in the CIS, but companies everywhere in the world face problems with estimating the realizable value of their fixed assets for purposes of debt repayment. Therefore, a common practice in the West is to replace total assets in the denominator of the ratio with current assets, which do not include fixed assets. The result is the ratio of debt to current assets, which is a more strict measure of indebtedness. Current assets are usually less than a year old, and their book value is therefore close to their cash value. Current assets are much more liquid than fixed assets, i.e., they are much easier to convert into cash. They consist of accounts receivable, which

are practically near-cash (assuming that they can be collected from debtors), and inventories of inputs, raw materials, finished goods, and unfinished work in process, all of which are also assumed relatively easy to sell and convert into cash. In CIS farms, inventories constitute a much larger component of current assets than, for instance, in US farms (**Figure 4**). There are suspicions that much of these inventories, whether finished products or old stocks of inputs, are not really saleable, certainly not for their book value, just like fixed assets. It is therefore advisable to measure farm indebtedness in CIS by means of an even more stringent ratio. This so-called quick or acid ratio measures debt only in relation to liquid current assets, i.e., cash and near-cash, excluding the less liquid and potentially unsaleable inventories.

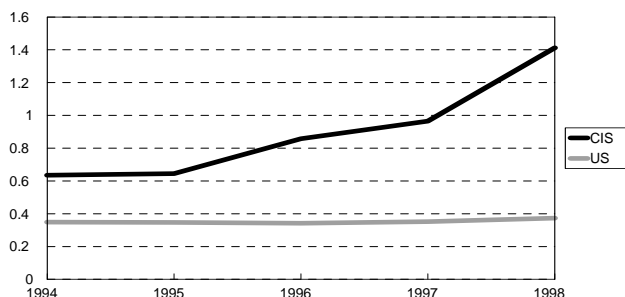


**Figure 4.** Share of inventories in current assets (1998)

All three basic ratios measuring the capacity of farms to repay their debt – the ratio of debt to sales, the ratio of debt to current assets (including inventories), and the ratio of debt to liquid current assets (excluding all inventories) – increase over time, which is a definite sign of rising indebtedness (**Figures 5, 6, 7**). Yet while the values of the first two ratios are not particularly alarming by world standards, the ratio of debt to liquid current assets rises to stratospheric levels. On average in Russia, Ukraine, Belarus, and Moldova this ratio rose from 0.6 in 1990 to over 4 in 1998. This means that the liquid assets, when converted into cash at their full book value, will cover less than 25% of current farm debt. The corresponding ratio for US farms is 1.5, i.e., liquid assets of US farms cover 67% of current debt. Moreover, for US farms all three ratios have remained perfectly steady over the years: there has been no deterioration in the solvency of US farms, while CIS farms have become much less solvent over the decade of transition.

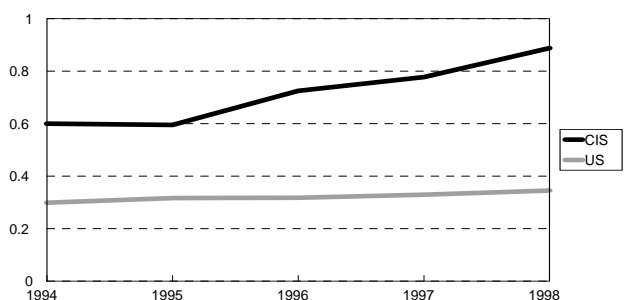
While all three ratios point to increasing indebtedness, it is particularly the ratio of debt to liquid assets that confirms the existence of a serious problem in CIS farms: farms can only repay a small fraction of their debt from cash and near-cash reserves. To repay the bulk of their debt, they have to rely on sale of inventories and liquidation of fixed assets, which is a proposition with dubious and uncertain outcomes even in established market economies.

Debt to Sales: CIS-4 and US



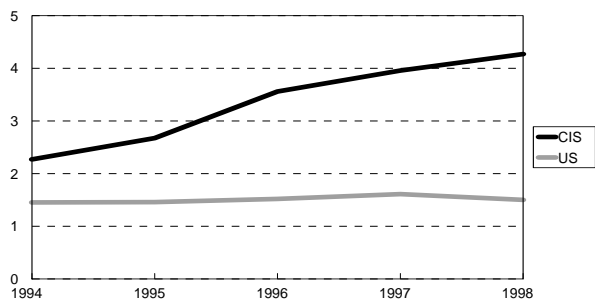
**Figure 5.** Debt-to-sales ratio: CIS-4 and U.S.

Debt to Current Assets: CIS-4 and US



**Figure 6.** Ratio of debt to current assets (including inventories): CIS-4 and U.S.

Debt to Liquid Current Assets: CIS-4 and US

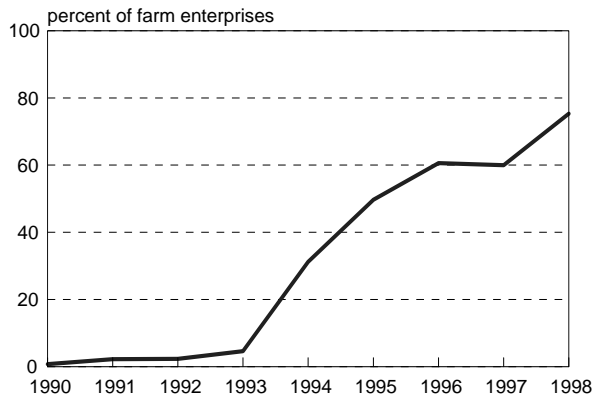


**Figure 7.** Ratio of debt to liquid assets (excluding inventories): CIS-4 and U.S.

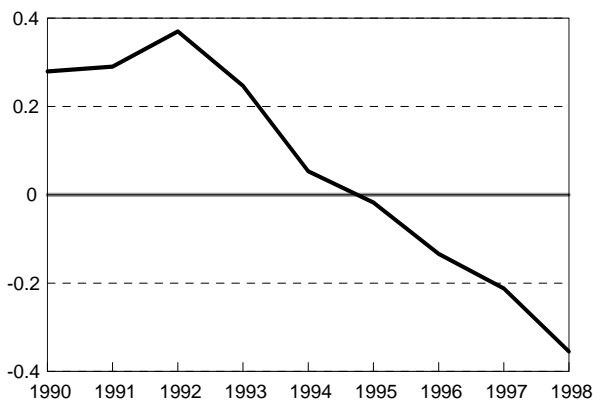
## B.2. Debt and profitability

Why is there a contradiction between the ratio of debt to liquid assets, which presents a grim picture of debt repayment capacity, and the ratio of debt to sales, which optimistically suggests that debt can be repaid from just one year of sales revenue? The reason, quite simply, is that farm sales in CIS do not produce profits. The proportion of farms reporting losses has increased markedly since 1994, and well over 50% of farm enterprises are unprofitable in recent years (**Figure 8**). Sales revenue is entirely absorbed by wages and other production costs, which add up to 140% of sales. In other words, farm are losing on average almost 40% on each ruble of sales revenue (**Figure 9**). Farm operations do not generate net income that can be used to repay debt, however small.

Declining profits (and increasing losses) appear to be the major determinant of debt accumulation in CIS farms. The level of debt increases in inverse proportion to the level of profits: as profits decline and losses grow, the real level of farm debt increases. This result is observed both for the entire farm sector over time and across thousands of farms in one year (1998). So the debt problem is clearly attributable to lack of profitability.



**Figure 8.** Percentage of farms reporting losses: CIS-5



**Figure 9.** Ratio of profit to sales revenue: CIS-5

To explain debt accumulation, we thus need to understand the decline in farm profits. There are two broad groups of reasons for the growing losses in CIS farms: internal farm-level reasons, and external policy-related reasons.

The *internal farm-level reasons* are all related to the traditional collective farm structure, which basically has not changed during the decade of farm reorganization in the CIS:

- The farm enterprises have not reduced their size to more manageable dimensions;
- Farm managers are still committed to provide all members with jobs, regardless of cost-efficiency considerations;
- Farm enterprises are obliged to maintain the social infrastructure in the village, including the traditional free support to household plots;

- Farm operations remain largely production oriented, with no overriding emphasis on markets, consumers, and sales: farm managers are still production maximizers, not profit maximizers;
- Member-workers continue to function in a traditional collective environment, without any direct accountability for the results of their effort or their contribution to profits and losses.

All these internal reasons are obstacles to improving the cost-efficiency of farms, and necessarily lead to suboptimal profits. As long as CIS farms continue their strategy of formal reorganization, avoiding radical internal restructuring prescribed by market principles, they will not be able to improve their efficiency and profitability.

A rough breakeven analysis of farms in two Russian oblasts – Leningrad and Novgorod – has led to instructive results regarding cost efficiency and profitability. In Leningrad farms variable costs are less than prices received, each unit of sales makes a positive contribution, and the farms can switch from losses to profits if they increase the sales volume by a factor of 1.8. In Novgorod farms, on the other hand, variable costs (per unit of sales) are greater than the price received for products sold. This means that the more Novgorod farms produce and sell, the more money they lose. Each unit sold generates an incremental loss. Before attempting to increase their sales, Novgorod farms should look hard at their cost structure and change radically the composition of variable costs to ensure that they become less than the prices received.

Although Leningrad farms in principle can achieve profitability by increasing sales, the target of almost doubling the sales volume is not easy to meet in a generally contracting environment. To be realistically profitable, Leningrad farms should also work to reduce their production costs instead of counting on sales growth. Thus, potential profitability of farms in these two oblasts essentially depends on their ability to become more cost-efficient. Leningrad and Novgorod are probably quite representative of CIS farms in general. The required changes in cost structure of CIS farms are impossible in the traditional collective environment. To change the cost structure with the purpose of improving profitability, the farms must undergo deep internal restructuring and switch to accepted market principles of operations and management.

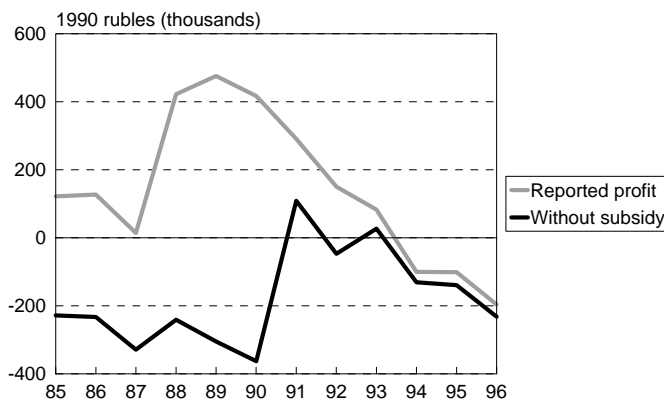
### **B.3. External factors affecting profitability: The impact of government policies**

In the past, the farms in Leningrad and Novgorod, two typical non-chernozem zone oblasts, were quite profitable. And yet **Figure 10** shows that past profitability was merely an illusion. In the past, the government traditionally injected massive subsidies into farm enterprises, which compensated them for low product prices and relatively high costs. Without subsidies, Novgorod farms were losing all through the early 1990s, and their reported profitability was sustained entirely by subsidies. Subsidization of agriculture was a serious burden on the state budget, but this burden was deemed necessary to ensure low food prices for the population. In recent years, however, the economic and political environment has changed, the subsidies have all but disappeared, and without their masking effect the proportion of farms with losses has increased dramatically. The farms



are facing an entirely different set of external factors linked with government policies, which have a very strong impact on profitability. Without subsidies, farms are not profitable *given the current production structure and management strategy*.

We are not advocating the reinstatement of subsidies. There are many other budgetary injections into agriculture (such as periodic debt writeoffs) that also need to be eliminated. On the contrary, we are arguing that farms must actively respond to reduction in government support by changing their objectives, by restructuring their operations, by reorganizing and realigning with market principles to achieve greater cost efficiency and eventually return to profitability.



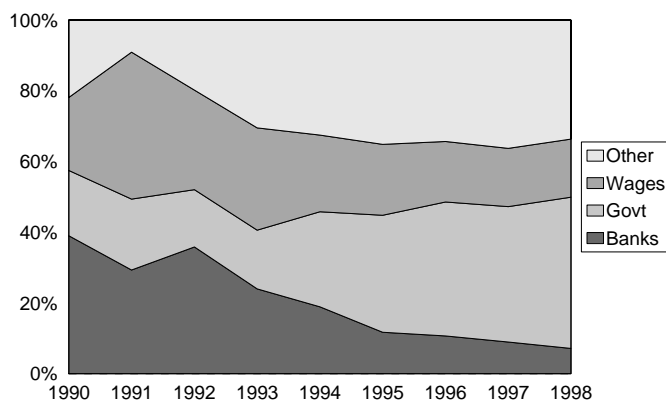
**Figure 10.** Impact of subsidies on profit for farms in Novgorod Oblast (gray curve – reported profit, black curve – profit excluding subsidies).

With the elimination of producer subsidies, the main external policy-related factor that has a detrimental effect on farm profits in CIS is the government policy to continue maintaining low food prices for the population. While prices for manufactured commodities, including farm inputs and machinery, have been liberalized and are not at world market levels, the prices received by farms remain low. This is reflected in the so-called “price scissors,” which correspond to the notion of deteriorating terms of trade for agriculture. Deteriorating terms of trade are a universal phenomenon observed in all market economies. In CIS, the “price scissors” effect is aggravated by government intervention in setting food prices. Elimination of government intervention in food prices will somewhat relieve the problem, but the general trend of deterioration in terms of trade will persist. Farms in market economies respond to deteriorating terms of trade by reducing their costs and increasing the output, i.e., improving their productivity and efficiency. As long as CIS farms fail to improve their productivity, they will continue to suffer from the squeezing effect of the “price scissors,” even if the government stops its intervention in food prices.

Thus, although external factors related to government policies certainly affect farm profitability, the ultimate solution to improving profits and thus reducing the burden of debt is basically internal. In response to changes in the economic and political environment, the farms must reorganize and restructure for greater cost efficiency and higher productivity. This is what Western farms do to remain profitable in a changing world.

#### B.4. Who are the farms' main creditors?

All through the 1990s, about half the farm debt came from the government and banks and the other half from supplier credit and wage arrears (**Figure 11**). The exact role of the banks in the early years of the decade is unclear: some of the debt recorded as bank loans (especially long-term loans) may in fact have been government debt channeled through state controlled agricultural banks. During the recent years, when the division between commercial banks and the government became much sharper and clearer than in the past, the share of bank lending in farm debt shrank to a minimum, and debt to the government became a dominant component.



**Figure 11.** Sources of farm debt in CIS-4

Another clear feature in the development of farm debt over the last decade is the substantial increase in the share of suppliers' credit, which nearly doubled from about 20% of total debt in the early 1990s to 40% in recent years (**Table 6**). This may be interpreted as a clear sign of progress toward commercial normalization of financial transactions in agriculture. Wage arrears are not and have never been a significant component of sources of farm credit.

**Table 6. Sources of farm debt: CIS-4**

	1990	1994	1998
Institutional credit	57	46	50
Commercial banks	39	19	7
Government	18	27	43
Wage arrears	21	22	16
Supplier credit	22	33	35

#### B.5. Is farm debt secure?

Farms in the CIS have had no profits in recent years, and they do not generate net cash flows that can be used to repay their debt. If farm debt cannot be repaid from operational earnings, it has to be repaid by liquidation or sale of assets. Overall, the total farm assets are more than sufficient to cover the debt. Even the current assets exceed the farm debt (see **Table 5**). Yet, as we know, the value of assets is highly uncertain when a firm

declares liquidation, and it is desirable to see to what extent farm debt can be covered with minimum reliance on the fixed assets.

A certain natural matching may be suggested between different categories of farm assets and different groups of creditors. Thus, we should be able to repay suppliers by selling the inventories, and the banks by converting the liquid assets into actual cash (i.e., collecting accounts receivable, selling off securities and investments, etc.). If these two categories of relatively saleable current assets do not leave surplus cash for further debt reduction, the government can be offered to take over the social fixed assets in repayment of its debt and the workers, as a last resort, can be offered ownership of enterprise housing – another component of fixed assets – in payment of their wage arrears. This will not really compensate the workers for their lost wages, because they anyhow have secure tenant rights in enterprise housing and there is no active market in apartments in rural areas to cash in on their new property. Yet, in a pinch, privatization of enterprise housing against wage arrears may be better than nothing for workers.

**Table 7** shows that in the CIS countries all the main categories of farm debt are securely covered by assets in the matching categories. Thus, the value of inventories exceeds the amounts owed to suppliers by a factor of 2. Liquid assets exceed outstanding bank credit by about a factor of 5. This essentially means that liquid assets cover the entire debt to commercial banks and even part of the debt to suppliers. Social assets are more than sufficient to cover the obligations to both workers and the government. Although at present farms do not generate cash to repay any of their loans, they are not bankrupt in the sense that their current assets (augmented by the non-productive component of fixed assets) are sufficient to cover all outstanding debt with a comfortable margin. Farm debt is secure if the assets are saleable or can be given up in exchange for outstanding debt.

**Table 7. Coverage of Debt by Assets in CIS-4**

	Rus	Ukr	Mol	Bel	Average CIS-4
Inventories/suppliers credit	2.3	2.5	1.3	4.5	2.6
Liquid assets/bank credit	6.9	13.9	4.5	1.8	6.8
Social assets/wages + government debt	2.3	1.1	1.3	2.6	1.8
Enterprise-owned housing/wage arrears	1.3	3.0	NA	NA	
Other social assets/government debt	0.9	2.0	NA	NA	

We have to repeat the same caveat as before: these are sector averages, and they do not reflect the situation in extreme cases. In some farms, current assets may not be sufficient to cover debt, and combined with lack of profitability this is a sign of severe financial distress, or insolvency. Yet the percentage of such farms is not very high, and on the whole farms can cover their debt with their current assets, which are much more liquid and saleable than buildings and machinery. Drastic debt settlement procedures may be necessary for a relatively small number of farms, and *the main focus should be on enabling farms to regain profitability by market mechanisms.*

## B.6. What can be done to resolve the farm debt problem?

I think that we would need a discussion at the end to tie the Tajik and Moldova. Don't you think so?

Regarding "success" I know that we can not go back to the 5 countries and follow whether their debt was reduced to manageable levels as a marker of "success". But at least there is no more widespread political problem from the debt, which is what there was before. However, has our thinking about farm reorganization changed since 2000? Do we continue to think that the best way to go is the Moldovan way? Moldova still has the agricultural enterprise problem that does not plague Azerbaijan, Georgia or Armenia.

Accumulation of farm debt is caused by two sets of factors: external factors related to government policies that produce a non-conducive economic environment for farm operation, and internal factors related to farm organization and structure that lead to low productivity and growing losses. Effective resolution of farm debt requires addressing both sets of factors.

### *Why not bankruptcy?*

Superficially the easiest and most obvious option for resolving farm debt would be to follow the practice of market economies and the experiences of some countries in Central Eastern Europe. Insolvent farms would be declared bankrupt and go into liquidation, clearing the stage through debt restructuring for the creation of new financially viable units. This is how insolvent farms are treated in mature market economies, and how the more successful transition countries, such as Hungary, have dealt with the resolution of farm debt problems since the beginning of transition. Indeed, many experts recommend following this path in the CIS countries as well. The present study, combined with other experiences (specifically the experience of Israel discussed in **Part C**), indicate that the standard bankruptcy-based procedures may not offer a desired solution given the specific circumstances in the CIS.

- A very large number of farms (in some countries more than 50%) are technically bankrupt in the sense that they report losses and cannot repay any debt;
- The special structure of farm assets in relation to debt and the economic state of the farms makes asset-driven debt restructuring difficult: farm fixed assets are grossly overvalued and not saleable;
- There is little effective demand for the farm assets which may be offered to creditors in a liquidation process;
- The status of land ownership is not clearly settled in most countries, and land generally has no value for debt settlement.
- There are no effective bankruptcy courts, and very few bankruptcy cases have actually been brought to completion;

Given the actual conditions in the CIS, the optimal approach to resolving farm debt should probably include the following set of actions.

- Creation of an incentive system and a macro-policy framework for agriculture that allows efficient agricultural producers to make profits and to invest;
- A one-time process of expedited debt settlement conditioned on genuine internal restructuring and privatization of the farms participating in the debt-settlement program;
- Creation of necessary economic conditions for the recovery of the restructured farms emerging from the debt-settlement procedure;
- Implementation of a working bankruptcy system that will prevent accumulation of new debt in farms created through the process of restructuring and debt settlement.

### *Creation of a conducive economic environment*

Comparative analysis of all transition countries suggests that creation of a transparent macroeconomic framework and incentive system is an essential condition for the recovery of the agricultural sector, including farm-debt resolution. First, all remaining government intervention in agricultural markets has to be removed, farmers must be allowed to make their own production decisions, and prices for farm products must be set by free negotiation between producers and buyers. Internal and external trade restrictions and foreign exchange controls need to be abolished. The freer the trade flows, the greater the benefit to everybody, including the farms. Governments do not have to withdraw from the markets as buyers, but governments must act on equally competitive terms with all others. If the government's offer is sufficiently attractive, producers will sell to the government. Otherwise, it is in the national interest to let producers sell elsewhere.

Currently governments in the region justify their interventions in agricultural markets by social objectives. There is an overall tendency to keep food prices low to support the urban population. This policy is a key cause of farm indebtedness, and a significant obstacle to the success of any land reform and farm restructuring program. Government intervention in agricultural markets is the wrong answer to real social problems in urban areas. In the longer term, this policy is counterproductive as it harms both the urban and the rural poor.

The history of farm debt in the CIS countries provides many examples of attempts to resolve the problem of farm debt. These include debt write-offs, moratoria, debt rescheduling and restructuring. It is clear that these attempts have not been successful.<sup>5</sup> They have not stopped the accumulation of debt because they have been treating symptoms, and not the true causes of the problem. The conventional measures have not changed the macroeconomic and incentive framework around the farms, and they have left the inherited farming and ownership structures intact. The key to the solution of the farm debt problem is improvement of the incentive framework combined with genuine restructuring and privatization of farms. It is only in the context of these external and internal institutional measures that a targeted resolution of farm debt is likely to succeed.

---

<sup>5</sup> They have not been successful in Israel either, as debt quickly returned to the original level (or higher) after each sporadic write-off or rescheduling attempt for a particular region or farm. See section C.2.

### *Integration of debt settlement with farm restructuring*

The linkage of debt settlement with farm restructuring and privatization offers many advantages under the current conditions in the CIS. Yet the implementation of an integrated program linking farm restructuring with debt settlement raises a number of fundamental issues that require close attention.

- *The relation of farm members to accumulated debt.* In an established market environment, owners are obviously responsible for any debt. In the CIS, however, the farm members (the potential beneficiaries of land reform and the shareholders of new corporate structures) had no influence in the past on the decisions that led to the accumulation of old debt, and by right they should not be held liable for the full debt overhang. Strict application of the principle of owners' responsibility for the full debt would have harmful social and economic consequences for the process of land reform and farm restructuring. Socially, the implication is that a large number of collective farm members would leave the socialist system empty-handed, without a minimal inheritance from the past, even though they had not been actively involved in the past decisions. Economically, this would drastically decrease the incentives for individual farming and make the creation of viable individual farms more difficult. Yet it is hard to absolve the potential beneficiaries from all liability. The best solution is probably somewhere in the middle, for instance, to exclude the essential factors of production, such as land, animals, and basic machinery, from the pool of assets available for debt settlement, but to allow other assets to be used for debt settlement.
- *The degree of necessary farm restructuring for debt settlement.* Experience shows that if debt is written off while the farm organization remains unchanged, the result has never prevented re-accumulation of new debt. In parallel with treating the outstanding debt, it is essential to implement a genuine restructuring of the farms in line with market principles with the goal of improving productivity and profitability. Without addressing basic ownership and management problems, including the development of realistic business plans, debt restructuring programs have very little value. We recommend starting the process of restructuring with the allocation of physically identified land parcels with ownership titles to individuals. The new owners then should be allowed to choose freely the actual farm organization in which they prefer to continue using their land and other resources.
- *Relation of newly created farming entities to land.* In the case of individual private farms, this question does not arise. Individual farmers cultivate their own land, and they may lease additional parcels from others. In the case of corporate farms, the method of acquiring use rights in land remains an essential question. In the initial phases of land privatization, when land markets are not yet functioning and owners are not fully aware of their rights, individuals should choose a mechanism to transfer the use rights to their land in a form that allows for relatively easy changes and adjustments in the future. The investment of land in the equity capital of a joint-stock company is thus the least desirable option because of its permanency. From the point

of view of the owners' interests, a medium term lease (not longer than three to five years) is the solution that retains enough freedom for future decisions.

- *Role of government in the debt settlement process.* The governments have an obvious role in the debt settlement process at least for two reasons. First, on the technical level, governments must be involved in the process because a significant portion of the debt is owed to the government. On a deeper, more fundamental level, post-Soviet governments are directly responsible, through their policies, for the accumulation of farm debt: they placed their trust in the continued existence of large-scale farms that succeeded the kolkhozes and the sovkhozes, thus obstructing sweeping individualization of agriculture (contrary to what was done in Armenia, Georgia, and Azerbaijan). The governments, including the Government of Tajikistan, must face to this responsibility and assume a significant portion of the costs of debt resolution.

The government portion of farm debt (net of the amounts that government procurement owes to the farms) is best settled against the value of social assets of the farms. This should be finally used as an opportunity to take the social assets off the farms' balance sheet. The debt to the government is probably the component where a write-off may be appropriate if certain conditions are met.

In addition to making arrangements to resolve the government component of farm debt, the governments also need to be involved in the settlement of the remaining debt. In theory, one might argue against giving any role to the government in settling debt to the private sector. In practice, however, the potential benefits of a quick resolution of farm debt, e.g., in the form of increased tax revenues, can easily offset any expenditures and costs that the government will incur in facilitating the debt-resolution process. Therefore, the government definitely should be involved, even to the extent of using some budget resources, in reaching a full settlement of all farm debt, including debt to the private sector.

### **B.7. Farm debt resolution program in Moldova (1998-2000)**

Moldova resolved its farm debt problem not through blanket bankruptcy procedures, as some experts recommended at the time, but through a one-time comprehensive out-of-court debt settlement linked with farm restructuring and privatization. The program was designed along the lines suggested in the previous section, and the framework for this integrated approach, as developed and implemented in Moldova in 1998-2000, had the following main features:

- The major objective of the one-time intervention was to create new farm entities that would be free of past debt burden and have the potential to become economically viable. The goal was not reorganization of existing enterprises, but actual creation of new entities compatible with market principles of operation.
- The decision to launch the debt settlement process in each farm enterprise and the choice of the form of the new entity was left to farm members. The decision-making

process was supported by sufficient information outlining in detail all implications and alternatives, informing the members of the basic market principles of farm organization and management.

- The debt settlement process was managed by a debt-settlement committee appointed by a national body and consisting of local and outside experts. The committee announced the start of the process and also collected the claims from the creditors.
- The outstanding debt was settled primarily from the assets of the farm enterprise. Land remained outside the debt settlement procedure. The non-land assets were divided into three groups: (a) machinery and livestock, which was earmarked for distribution to farm members and was excluded from the process; (b) inventories, cash, receivables, other current assets, and all production fixed assets (i.e., storage, farm buildings, processing facilities, etc., excluding housing and social infrastructure), which were used for settling the debt of commercial creditors; (c) social assets and non-privatized housing, which were used for settling the debt to the government and to payroll.
- The debt settlement process was implemented with the full support of the government, and the budget was called upon as a last resort to reach a full settlement of all residual amounts remaining after the farm assets were exhausted.
- The land shares, as well as farm machinery and livestock represented by individual property shares were not subject to the debt settlement procedure. These assets remained in the hands of the individual farm members. To strengthen this guarantee, the first step of the debt settlement procedure included issue of legally binding land titles.
- The wage arrears were settled by transfer of the non-privatized housing stock to individual farm members. In cases when the book value of the housing stock was insufficient to cover wage arrears, the previously calculated value of individual property shares was adjusted to reflect unpaid wages.
- The debt to all state and government agencies (including state-owned enterprises) was settled basically through transfer of social assets to local municipalities. If the social assets of a particular farm were not sufficient to cover the debt to the state, the residual was written off by the government. If the social assets exceeded the obligations, the balance of their book value was purchased by the municipalities with the aid of the state budget and the proceeds were used to repay other debt.
- The full settlement of debt to commercial suppliers was an integral part of the process. All assets under lien were automatically transferred to the entitled creditors. The residual farm assets, excluding the portion distributed to farm members and used for settlement of wage arrears and government debt, was offered to the creditors up to the limit of the debt. The unsettled debt was taken over by the state budget and used as a future tax credit for the suppliers or converted into long-term bonds.



In Moldova, the total debt assumed by the government was estimated at 325 million lei (US\$26 million). Out of this amount, farms contributed 32% (103 million lei) by surrendering to the government their excess social assets and other redundant facilities. Private creditors absorbed 8% (25 million lei) through tax offset arrangements. The government had to issue bonds for the remaining 60% (197 million lei, or US\$16 million), to be repaid over 5 years in amounts gradually raising from 10 million lei (less than US\$1 million) in year 1 to 60 million lei (US\$5 million) in year 5.<sup>6</sup>

- The process ended with the full liquidation of the old entity, without any legal successor, and registration of new entities by the former farm members.

The process had a clearly specified completion date for each farm (four-five months duration). The overall time frame for the entire project nationally was also set in advance. A core group of experts were trained for the preparation of detailed procedures and manuals. These experts traveled across the country to train local forces and supervise implementation.

Certain conditions seem to be essential for the success of the framework implemented in Moldova in 1998-2000:

- legal framework for land ownership and titling in place;
- procedures for farm privatization have been adopted;
- there is political consensus behind a complete and comprehensive approach to farm privatization and farm debt settlement;
- the task is of manageable size;
- the technical implementation is feasible (e.g., adequate donor support);

The principles of the Moldova approach are valid for all CIS countries, including Tajikistan. The regional approach provides a solution even for the larger countries, such as Russia and Ukraine: comprehensive programs are to be implemented first in the most progressive regions. The experiences of the regional approach can be enlarged to a national program at a later stage.

Finally, it is important to emphasize that the most obvious indicator of success in farm restructuring and debt settlement is the future financial performance of the new restructured farms. The efforts to resolve the debt problem are not finished with the formal elimination of past debt. First, the macro-economic incentive framework and the internal farm organization must ensure that farms can potentially be profitable and viable. Second, a working bankruptcy system needs to be put into place immediately after restructuring and debt settlement. Bankruptcy procedures need to be consistently and impartially enforced in the future to avoid accumulation of new debt and to facilitate further restructuring toward greater productivity and efficiency in the farming sector.

---

<sup>6</sup> D. Dumbraveanu, R. Flick, A. Muravschi, S. Shapa, and C. Tanase, "Moldova," background paper for *Farm Debt in CIS: A Multi-Country Study of Major Causes and Proposed Solutions*, ECSSD Environmentally and Socially Sustainable Development Working Paper No. 27, September 2000, p. 26.

The Central European experience indicates that restructured agriculture, once relieved of the past debt burden, needs to be supported by a non-distortional transparent and efficiency-focused incentive system, as well as a well-designed government strategy to facilitate investments, achieve quality improvements, and enhance competitiveness. A discussion of these measures, however, goes far beyond the scope of the present note.

## **PART C. FARM DEBT CRISIS IN ISRAEL**

Unlike the CIS countries, Israel has always been a free market economy, although with a layer of government intervention superimposed. Government intervention was very strong in the 1950s and the 1960s, especially in agriculture and capital markets, but it has significantly declined over time. The government's goals in agriculture were and to a certain extent still are to support farm incomes, to improve food supply, and to maintain the rural population.

The main feature that made the Israeli market agriculture similar to the CIS farm sector was the prevalence of soft budget constraints and moral hazard behavior. Over the years, the government, by its paternalistic behavior toward agriculture, created the impression that farm debt was secure and that farms would not be allowed to fail. This encouraged banks to lend to agriculture without applying the standard screening measures of creditworthiness and repayment capacity. Furthermore, farms themselves felt that they could take advantage of credit facilities to finance investment and even consumption without regard to financial prudence as long as the government was there to bail them out in an emergency. This combination of soft-budget constraints and moral hazard led to extreme over-borrowing and was at the root of the Israeli farm crisis that erupted in the late 1980s.

Government policies in Israel prior to the mid-1980s encouraged over-borrowing and over-investment and indirectly fueled the inflationary pressures. The government's inevitable decision to implement essential anti-inflationary policies after 1985 immediately brought the lending spree to an end and caused the credit bubble to burst. The magnitude of the debt overhang put the entire agricultural sector at risk of default and required active involvement of the government in debt settlement negotiations.

### **C.1. Cooperative structures in Israeli agriculture**

Agriculture in Israel is agriculture of cooperatives. Eighty percent of Israel's agricultural product comes from the cooperative sector, both family farms in moshavim and the collective kibbutzim. Cooperation in agriculture was encouraged by the government as a matter of policy: new immigrants – penniless and without any farming experience – were settled in cooperative villages (moshavim); land and water were allotted to the moshav and distributed equally among the members; production quotas in milk, eggs, broilers, fruits, and other products were allocated on a village basis and the moshav decided on internal distribution; government agencies usually consulted with the cooperative association in the moshav on the allocation of long-term loans to individual farm operators. Over time many of the newly settled operators acquired farming skills and cooperation became well established. Yet the patterns of government's paternalistic behavior created the general feeling – and not only among farmers – that it was the government's responsibility to maintain the welfare of the farming sector.

The cooperative structure in Israel is basically organized on two levels: the local village level constituted by individual members and the regional level constituted by the first-

level cooperative villages. The third national level consists of organizations whose functions include oversight, coordination, and lobbying.

*Primary cooperatives: the moshav and the kibbutz.* A moshav (plural moshavim) is a farming community in which all farms are family-operated and all farmers are members of a democratically run multipurpose village cooperative. In principle, the cooperative service association in the moshav purchased all farm supplies for its members and marketed their farm products. In contrast to the moshav, the kibbutz (plural kibbutzim) is a commune. Members worked together as in a production cooperative and receive from the kibbutz all their daily needs (food, housing, health care, education, and clothing). A kibbutz member owned his or her personal belongings, but no other property.

Differences in the degree of cooperation induced many other operational differences between kibbutzim and moshavim. As technological change drove labor force out of agriculture, members of moshavim shifted mostly to part-time farming and found additional employment off the farm. The kibbutzim, on the other hand, invested at their own risk in the creation of non-agricultural employment opportunities for their members in manufacturing and services. As a result, today, only a third of moshav members draw all their income from agriculture, and in kibbutzim farming contributes only a third of the total income.

*Secondary cooperatives: regional enterprises.* Moshavim and kibbutzim in turn were members of two types of second-order cooperatives: regional supply cooperatives set up to purchase farm inputs for the moshavim and the kibbutzim, and regional service enterprises (feed mills, meat packers, fruit and vegetable processors, transportation services, and others). Zealous support of rural development by public agencies, easy access to credit through the supply cooperatives, and strong political regional lobbies all resulted in overexpansion of most of the service enterprises. This occurred particularly in the 1970s when credit was ample and economic optimism ran high. Consequently, in the early 1980s, many service enterprises operated at less than full capacity and did not cover their operating costs.

## **C.2. Financial intermediation<sup>7</sup>**

Israeli cooperatives – both the moshavim and the regionals – provided a wide range of input supply and product marketing services to their members, including sorting, packaging, storage, and transportation facilities. Yet the most important service they provided was financial intermediation. Farmland in Israel is nationally owned and moshavim and kibbutzim could not use it as collateral. Lack of collateral spurred the development of financial cooperation, which started as a simple mechanism for exploiting economies of scale to raise supplier credit and bank loans at beneficial terms for farmers. The supply cooperatives gradually expanded into full-scale financial

---

<sup>7</sup> This section describes financial intermediation as it was practiced before 1985 crisis. One of the consequences of the crisis has been a substantial reduction in the financial interconnections between cooperatives, especially among the moshavim.

intermediation, raising credit from both suppliers and commercial banks for the benefit of their members – the moshavim and the kibbutzim. The moshav in turn acted as a source of credit for its member-farmers by borrowing “wholesale” from banks and lending to its members. The associations also accepted deposits from members with financial surpluses for on-lending to others. The supply cooperative and its members – both moshavim and kibbutzim – were strongly linked through credit and also through joint ventures in regional service enterprises. Interlinkages between cooperative credit and marketing of farm products through the cooperative created the institutional guarantees for repayment that replaced collateral for loans in cooperative agriculture.

In addition to credit–marketing interlinkages, the lack of collateral was overcome by a system of mutual guarantee arrangements that operated on several levels. All members of a moshav mutually guaranteed the loans that the moshav cooperative raised—for joint ventures or to be distributed to individual farms. Similarly, moshavim and kibbutzim were guarantors to loans their regional cooperative associations took. Thus, virtually all members – individual farmers, moshavim, and kibbutzim – were parties to mutual guarantee arrangements and all were mutually responsible for loans raised by their cooperatives.

The purpose of mutual guarantees was to reduce the risk banks incurred in lending to cooperative farms and their secondary cooperatives. Practical experience reduced the subjective risk as perceived by the creditors even further: again and again, particularly in the 1950s and the 1960s, the government bailed out kibbutzim and moshavim that had run into financial difficulties. The assistance was usually provided in the form of government-backed long-term loans that replaced short- and medium-term credit – a kind of a debt rescheduling mechanism. The remedy by government intervention was not long-lasting, however. In many cases farmers and cooperatives returned to the same problems just several years after rescheduling.

Nevertheless, the recurrence of these debt rescheduling episodes, sometimes general and sometimes specific to certain farms or regions, was one of the major reasons for the widespread belief that agriculture would not be allowed to collapse. Banks were not only willing to lend to agriculture, but they were actually eager to have cooperatives among their clients. These factors created a dangerous combination of soft budget constraints, whereby farms were allowed to borrow without regard to repayment capacity, and moral hazard behavior, whereby farms were willing to take on more and more debt without regard to returns on investment.

### **C.3. The consequences of inflation and negative interest rates**

Israel has had two periods of severe inflation. The first was in the early 1950s when a fledgling government of the new independent state strove to finance war and reconstruction with a small tax base and a poor administration. Prices increased by 56% in 1952, but were quickly brought under control thereafter. The second wave of inflation started in the mid-1970s, accelerating steadily from a yearly rate of 12% in 1970 to nearly 500% on an annual basis in the first half of 1985. Contrary to the inflation in the 1950s,

the rising prices in the 1970s-1980s were fueled by an expanding supply of credit, much of it imported from recycled petro dollars.

Market interest rates were naturally rising during this inflationary period, but they lagged behind inflation and the real rates remained consistently negative for more than a decade between 1974 and 1985. The negative real rates and easy access to credit encouraged overinvestment and discouraged saving. The secondary regional cooperatives borrowed easily on the strength of mutual guarantees and channelled large volumes of credit to their members. Part of the debt financed investment in productive assets (often contributing to overcapacity), part financed housing and consumer durables, and part was spent to increase current consumption and standards of living. Consideration of short-run inflationary gains dominated long-run economic health.

By mid-1985, when the accelerating inflation was reaching more than 500% on an annual basis, the government had to halt it. The change of policy came on 1 July 1985 with the introduction of strict monetary and fiscal measures: price increases were stopped, a severe credit squeeze was enforced, and interest on short-term credit was raised to unprecedented levels (up to 100% per annum). A great part of the credit channelled through the secondary cooperatives to kibbutzim and moshavim was short-term and it had to be rolled over at the new high rates. No business could survive such sky rocketing rates and most of the kibbutzim, moshavim, and regional cooperatives became insolvent almost overnight. By mid-1986 it was clear that cooperative agriculture was in a deep financial crisis.

The set of government policies in 1985 quickly brought the inflation down to approximately 20% per year. Interest rates, however, lagged also when inflation slowed down, and this drove real rates to extremely high levels. Agriculture enjoyed growth and rising incomes when credit was in ample supply and real interest rates were negative. It accumulated a large outstanding debt during this period, and as a consequence found itself in a deep repayment crisis when inflation halted and real rates switched to positive.

Agriculture was the victim of both the inflation and the policy measures implemented to halt it. Inflation encouraged over-borrowing, and the high real interest rates after 1985 made repayment impossible. The crisis reveals weaknesses inherent in the cooperative form of organization, as well as weaknesses in government lending policy to agriculture. Many businesses suffered severely when economic conditions changed with the introduction of the anti-inflationary policy in 1985. But it is only in agriculture that a whole sector – the cooperative sector – collapsed financially. Cooperative financial intermediation was founded on mutual liability arrangements and the crisis highlighted the failure of these arrangements. Mutual liabilities encouraged over-borrowing when that was possible and could not be enforced when the need arose.

#### **C.4. The crisis**

The crisis erupted at the end of 1985 once creditors realized that agriculture could not service its debt because of the very high real interest rates and the unwillingness of the

government to continue bailing out the sector. Private lenders and commercial banks refused to extend additional credit and insisted that loans be repaid. This was impossible and most regional cooperatives and many of the moshav associations collapsed. Farm production has continued, often with private credit arrangements (for instance, wholesalers paying in advance for farm products) and the farmers' personal resources. But this did not provide a full solution to the crisis: (a) in most cases, the available sources were insufficient for investment in equipment and machinery and farmers found it hard to renew their production assets; and (b) banks and other creditors insisted on repayment of the outstanding loans. For most farmers, the heavy burden was not their own debt but their share of the mutual liabilities – their share in covering the debt of several heavy borrowers in the moshav and the debt of the regional service enterprises.

While the crisis was triggered by the anti-inflationary policies of July 1985 and took the form of financial insolvency, it had deeper roots. Four interrelated problems surfaced at that time.

a. *Lack of control.* Secondary cooperatives and associations in moshavim transferred credit to their members disregarding the ability to repay loans on the terms received. Members in cooperatives, who mutually guaranteed loans taken by their associations, did not exercise the appropriate control over the actions of the officers running their financial affairs. Banks continued to extend credit even to cooperatives that could not demonstrate stable economic and financial standing. Banks and other agents continued to rely on the government's implicit safety net and neglected sound financial practices. This lack of control is a facet of what is usually referred to as "soft budget constraints" in the context of financial behavior in transition countries.

b. *Diminished ideological commitment.* Originally, members in moshavim, and particularly in kibbutzim, were highly motivated ideologically; they viewed themselves as pioneers in a national movement striving to return Jews to the land and strictly adhered to the cooperative norms of the kibbutz or the moshav. Once the state was established and its economy stabilized, the national argument for cooperation lost its force, particularly with the second and third generations who took the moshav and the kibbutz for granted and did not have their parents' devotion to the original ideology. Reduced ideological commitment led to a reduction in the adherence to old norms. Thus, members found it relatively easy to renege on the interlinkage arrangements promising to market all their products through the moshav association in repayment of the loans they had received. Marketable products leaked to outside marketing channels, and the moshav debt remained unpaid.

c. *Moral hazard behaviour and free riding.* Ample credit supply, mutual guarantees, and reliance on the government to bail out failing cooperatives encouraged moral hazard behavior:<sup>8</sup> farmers, cooperatives, and kibbutzim readily borrowed to finance both

---

<sup>8</sup> Moral hazard arises in situations where economic agents do not bear the full consequences or benefits of their actions because of uncertainty or restricted contracts; broadly, the hazard is the action of economic agents in maximizing their own utility to the detriment of others.

production and consumption investments (e.g., building new homes) even when repayment was uncertain. Moral hazard behaviour was not demonstrated only in the financial area. The loss of strict ideological commitment resulted in the deterioration of the work ethic in the kibbutzim: members sought easy tasks and shorter work days; kibbutzim faced increasing difficulties in recruiting talented and experienced people to undertake responsible tasks; able young members either left or went to work outside the kibbutz.

d. *Poor economic performance.* Easy credit and inadequate control led to overinvestment and hence to poor economic performance. Political and social considerations took precedence over efficiency and income. Survival was deemed secured with the government safety net. Consequently, when inflation was halted and rates of interest rose, many of the cooperatives discovered that they were operating at a loss. Many of their economic activities were unprofitable and the debts they accumulated were enormous and rising as interest charges continued to accrue.

Agriculture could not repay or service its debt in full; the question was how to apportion the losses. Once this was realized, the government intervened in an effort to reach a negotiated debt settlement between the banks, on the one hand, and the moshavim and kibbutzim on the other. An agreement was formulated in 1988 but its implementation was slow as farmers hoped that they could gather political support for a more favorable settlement.

### **C.5. The debt settlement**

When the crisis erupted, most farmers in the moshavim and many of the kibbutzim found that either they were heavily in debt themselves or they were guarantors of debt incurred by others—their peers and especially the secondary regional cooperatives to which they belonged. Mutual guarantees were useless in circumstances of a system-wide collapse: nobody had the resources to repay anybody's debt. Moreover, the supreme court, where the problem eventually landed, freed the guarantors of their obligations, mostly on grounds that cooperatives were limited liability associations and as such members were responsible for the cooperatives' debt only up to the value of their shares, which was very small.

The government found itself in a dilemma. On the one hand, it could not simply bail out the cooperatives as it had done previously—the magnitude of the crisis was beyond the ability of the state budget and the public would not tolerate spending large sums of public money on the small farming sector. On the other hand, if unattended, the crisis could destroy cooperative agriculture and with it bring down three of Israel's largest banks. The government had to step in. The question was how to allocate the losses and at the same time secure continued functioning of agriculture.

The core of the debt settlement agreement was a combination of partial writeoff with rescheduling based on ability to pay. The settlement consisted of two parts:



- assessment of the income potential of the farms (“ability to pay”) and rescheduling of the portion of debt judged to be repayable;
- forgiveness of the debt that could not be repaid.

Once the ability to pay had been assessed, it was decided in 1989-1990 to write off close to a third of the outstanding debt and reschedule the remainder for a period of 15-20 years. In the kibbutz sector, where the debt was larger than in the family farms in moshavim, the government absorbed approximately one-third of the writeoff; two-thirds of the writeoff was assumed by the banks and other creditors. The same principle of sharing between the government and the banks was applied to the written-off portion of the debt of moshavim, although the exact shares were different.

Some numbers will help to visualize the magnitude of the task. By the estimates available in 1988, agriculture’s debt was NIS 6.5 billion, and the value of net capital was then NIS 6 billion NIS (\$4.1 billion and \$3.8 billion respectively at NIS 1.6 to the dollar). By these figures agriculture had negative equity: all its capital was financed by debt. Erasing a third of the debt and rescheduling the remainder of NIS 4.3 billion for a period of 20 years at 4.5% in real terms, the annuity would be NIS 331 million. This would be just possible to pay if agriculture continued to operate at the same level of profitability as in the 1970s, when operating profits were upward of NIS 300 million (in 1987 prices). If agriculture’s debt were actually repaid in this way, the sector would rebuild its equity over the next twenty years. However, repayment was by no means guaranteed, because the profitability of agriculture was falling in the 1980s and shortfalls might have to be offset by efforts to increase efficiency (through restructuring) or by income generated from off-farm activities.

The settlement agreements were reached nearly twenty years ago. Their implementation for the secondary cooperatives was relatively simple. In the moshav sector, these cooperatives ceased to operate and their assets were sold to private investors. In the kibbutz sector, the secondary cooperatives have continued to function, but generally on a modest scale and no longer as financial intermediaries.

The farm by farm implementation of the settlement agreements is not completed after twenty years, but the acute crisis atmosphere disappeared once the agreements were signed. The immediate consequence of the crisis was a significant change in the financial environment facing cooperative agriculture. Kibbutzim and individual farmers in moshavim now have to deal directly with commercial banks; they cannot rely anymore on “in-house” financial intermediaries, nor can they look to the government for rescue. Operating on national land, they cannot use land as collateral and credit is now extended only to operators who demonstrate sound economic performance. Farmers have to show financial accountability and follow strict financial discipline, observing hard budget constraints. The new system does not tolerate moral hazard behavior.

## **C.6. Lessons and recommendations**

The debt crisis experience of Israeli agriculture suggests that poor policy and bad institutions cause considerable damage. This is particularly true for the cooperative sector, because the dangers of moral hazard and free riding inherent to cooperatives are compounded when the government intervenes to relieve farmers of their accountability and commercial banks do not monitor the creditworthiness of the borrowers. A major responsibility therefore rests with the government and the lenders. The government must have the wisdom and the power to limit its involvement in agriculture, and let farmers be accountable for their actions. The lenders must know when to refuse new loans.

Farmers will act rationally and responsibly as individuals, but collectively they may easily follow myopic, even irrational, behavior. This difference between the individual and the collective grows stronger if moral hazard and free riding cannot be curtailed, leading to deterioration of cooperative ethics.

The government should not assume explicit or implicit responsibility for agriculture. Then both farmers and lenders will know that they are the sole residual claimants of profits or losses. It will be in their direct interest to tighten control and to follow prudent economic discipline.

Borrowers must be held responsible for their actions, individually or collectively. When private ownership of land is introduced, farmers will have more to lose if they fail. They will gain if they succeed and manage to accumulate comparatively large pieces of land.

## CONCLUSION

Tajikistan, like many other CIS countries, is struggling with the problem of debt overhang in farms. Many of the CIS countries have made attempts to solve the problem and similar discussions have been going on in Tajikistan for a number of years now. However, the general lack of political will and the prevailing unwillingness to make radical changes in the core of the inherited collective structure have resulted in temporary ad hoc solutions in other CIS countries. Instead of treating the underlying causes, these ad hoc measures typically address the symptoms and actually lead to further deterioration of the rural financial situation, including demonetization of the farm sector. A similar indecisive ad hoc attitude prevailing in Tajikistan has blocked all possible progress toward farm debt resolution in this country.

The table below outlines the main factors that emerge from our study as the causes of farm debt accumulation. To resolve the farm debt problems effectively, governments need to apply measures that address the combination of all these factors, including the non-conducive economic environment of the farms and the inherited unproductive internal organization. Effective resolution of the farm debt problem will remove one of the major bottlenecks in the process of agricultural reform.

### Major reasons for accumulation of farm debt

	Tajikstan (1999-2007)	CIS countries (1990-1998)	Israel (1986-2000)
Lack of farm profitability	Farms unprofitable	Farms unprofitable	Low and declining profitability
Organization	Collective dehkan farms, enterprises	Corporate farms in various organizational form	Cooperative farms
Government intervention	Investor/futurist financing mechanisms imposed; hukumat enforcement eliminates "freedom to farm"	Pervasive soft-budget constraints sustained	Soft budget constraints, moral hazard (readiness of the government to bail out failing farms)
Lack of transparency in accounting	Disputed information on origin and levels of debt	Disagreements between farm financial statements, bank records, and statistics	Banks unable to explain interest and inflationary linkage accruals

## PREVIOUS DISCUSSION PAPERS

- 1.01 Yoav Kislev - Water Markets (Hebrew).
- 2.01 Or Goldfarb and Yoav Kislev - Incorporating Uncertainty in Water Management (Hebrew).
- 3.01 Zvi Lerman, Yoav Kislev, Alon Kriss and David Biton - Agricultural Output and Productivity in the Former Soviet Republics.
- 4.01 Jonathan Lipow & Yakir Plessner - The Identification of Enemy Intentions through Observation of Long Lead-Time Military Preparations.
- 5.01 Csaba Csaki & Zvi Lerman - Land Reform and Farm Restructuring in Moldova: A Real Breakthrough?
- 6.01 Zvi Lerman - Perspectives on Future Research in Central and Eastern European Transition Agriculture.
- 7.01 Zvi Lerman - A Decade of Land Reform and Farm Restructuring: What Russia Can Learn from the World Experience.
- 8.01 Zvi Lerman - Institutions and Technologies for Subsistence Agriculture: How to Increase Commercialization.
- 9.01 Yoav Kislev & Evgeniya Vaksin - The Water Economy of Israel--An Illustrated Review. (Hebrew).
- 10.01 Csaba Csaki & Zvi Lerman - Land and Farm Structure in Poland.
- 11.01 Yoav Kislev - The Water Economy of Israel.
- 12.01 Or Goldfarb and Yoav Kislev - Water Management in Israel: Rules vs. Discretion.
- 1.02 Or Goldfarb and Yoav Kislev - A Sustainable Salt Regime in the Coastal Aquifer (Hebrew).
- 2.02 Aliza Fleischer and Yacov Tsur - Measuring the Recreational Value of Open Spaces.
- 3.02 Yair Mundlak, Donald F. Larson and Rita Butzer - Determinants of Agricultural Growth in Thailand, Indonesia and The Philippines.
- 4.02 Yacov Tsur and Amos Zemel - Growth, Scarcity and R&D.
- 5.02 Ayal Kimhi - Socio-Economic Determinants of Health and Physical Fitness in Southern Ethiopia.
- 6.02 Yoav Kislev - Urban Water in Israel.
- 7.02 Yoav Kislev - A Lecture: Prices of Water in the Time of Desalination. (Hebrew).

- 8.02 Yacov Tsur and Amos Zemel - On Knowledge-Based Economic Growth.
- 9.02 Yacov Tsur and Amos Zemel - Endangered aquifers: Groundwater management under threats of catastrophic events.
- 10.02 Uri Shani, Yacov Tsur and Amos Zemel - Optimal Dynamic Irrigation Schemes.
- 1.03 Yoav Kislev - The Reform in the Prices of Water for Agriculture (Hebrew).
- 2.03 Yair Mundlak - Economic growth: Lessons from two centuries of American Agriculture.
- 3.03 Yoav Kislev - Sub-Optimal Allocation of Fresh Water. (Hebrew).
- 4.03 Dirk J. Bezemer & Zvi Lerman - Rural Livelihoods in Armenia.
- 5.03 Catherine Benjamin and Ayal Kimhi - Farm Work, Off-Farm Work, and Hired Farm Labor: Estimating a Discrete-Choice Model of French Farm Couples' Labor Decisions.
- 6.03 Eli Feinerman, Israel Finkelshtain and Iddo Kan - On a Political Solution to the Nimby Conflict.
- 7.03 Arthur Fishman and Avi Simhon - Can Income Equality Increase Competitiveness?
- 8.03 Zvika Neeman, Daniele Paserman and Avi Simhon - Corruption and Openness.
- 9.03 Eric D. Gould, Omer Moav and Avi Simhon - The Mystery of Monogamy.
- 10.03 Ayal Kimhi - Plot Size and Maize Productivity in Zambia: The Inverse Relationship Re-examined.
- 11.03 Zvi Lerman and Ivan Stanchin - New Contract Arrangements in Turkmen Agriculture: Impacts on Productivity and Rural Incomes.
- 12.03 Yoav Kislev and Evgeniya Vaksin - Statistical Atlas of Agriculture in Israel - 2003-Update (Hebrew).
- 1.04 Sanjaya DeSilva, Robert E. Evenson, Ayal Kimhi - Labor Supervision and Transaction Costs: Evidence from Bicol Rice Farms.
- 2.04 Ayal Kimhi - Economic Well-Being in Rural Communities in Israel.
- 3.04 Ayal Kimhi - The Role of Agriculture in Rural Well-Being in Israel.
- 4.04 Ayal Kimhi - Gender Differences in Health and Nutrition in Southern Ethiopia.
- 5.04 Aliza Fleischer and Yacov Tsur - The Amenity Value of Agricultural Landscape and Rural-Urban Land Allocation.

- 6.04 Yacov Tsur and Amos Zemel – Resource Exploitation, Biodiversity and Ecological Events.
- 7.04 Yacov Tsur and Amos Zemel – Knowledge Spillover, Learning Incentives And Economic Growth.
- 8.04 Ayal Kimhi – Growth, Inequality and Labor Markets in LDCs: A Survey.
- 9.04 Ayal Kimhi – Gender and Intrahousehold Food Allocation in Southern Ethiopia
- 10.04 Yael Kachel, Yoav Kislev & Israel Finkelshtain – Equilibrium Contracts in The Israeli Citrus Industry.
- 11.04 Zvi Lerman, Csaba Csaki & Gershon Feder – Evolving Farm Structures and Land Use Patterns in Former Socialist Countries.
- 12.04 Margarita Grazhdaninova and Zvi Lerman – Allocative and Technical Efficiency of Corporate Farms.
- 13.04 Ruerd Ruben and Zvi Lerman – Why Nicaraguan Peasants Stay in Agricultural Production Cooperatives.
- 14.04 William M. Liefert, Zvi Lerman, Bruce Gardner and Eugenia Serova - Agricultural Labor in Russia: Efficiency and Profitability.
- 1.05 Yacov Tsur and Amos Zemel – Resource Exploitation, Biodiversity Loss and Ecological Events.
- 2.05 Zvi Lerman and Natalya Shagaida – Land Reform and Development of Agricultural Land Markets in Russia.
- 3.05 Ziv Bar-Shira, Israel Finkelshtain and Avi Simhon – Regulating Irrigation via Block-Rate Pricing: An Econometric Analysis.
- 4.05 Yacov Tsur and Amos Zemel – Welfare Measurement under Threats of Environmental Catastrophes.
- 5.05 Avner Ahituv and Ayal Kimhi – The Joint Dynamics of Off-Farm Employment and the Level of Farm Activity.
- 6.05 Aliza Fleischer and Marcelo Sternberg – The Economic Impact of Global Climate Change on Mediterranean Rangeland Ecosystems: A Space-for-Time Approach.
- 7.05 Yael Kachel and Israel Finkelshtain – Antitrust in the Agricultural Sector: A Comparative Review of Legislation in Israel, the United States and the European Union.
- 8.05 Zvi Lerman – Farm Fragmentation and Productivity Evidence from Georgia.
- 9.05 Zvi Lerman – The Impact of Land Reform on Rural Household Incomes in Transcaucasia and Central Asia.

- 10.05 Zvi Lerman and Dragos Cimpoiu – Land Consolidation as a Factor for Successful Development of Agriculture in Moldova.
- 11.05 Rimma Glukhikh, Zvi Lerman and Moshe Schwartz – Vulnerability and Risk Management among Turkmen Leaseholders.
- 12.05 R.Glukhikh, M. Schwartz, and Z. Lerman – Turkmenistan’s New Private Farmers: The Effect of Human Capital on Performance.
- 13.05 Ayal Kimhi and Hila Rekah – The Simultaneous Evolution of Farm Size and Specialization: Dynamic Panel Data Evidence from Israeli Farm Communities.
- 14.05 Jonathan Lipow and Yakir Plessner - Death (Machines) and Taxes.
- 1.06 Yacov Tsur and Amos Zemel – Regulating Environmental Threats.
- 2.06 Yacov Tsur and Amos Zemel - Endogenous Recombinant Growth.
- 3.06 Yuval Dolev and Ayal Kimhi – Survival and Growth of Family Farms in Israel: 1971-1995.
- 4.06 Saul Lach, Yaacov Ritov and Avi Simhon – Longevity across Generations.
- 5.06 Anat Tchetchik, Aliza Fleischer and Israel Finkelshtain – Differentiation & Synergies in Rural Tourism: Evidence from Israel.
- 6.06 Israel Finkelshtain and Yael Kachel – The Organization of Agricultural Exports: Lessons from Reforms in Israel.
- 7.06 Zvi Lerman, David Sedik, Nikolai Pugachev and Aleksandr Goncharuk – Ukraine after 2000: A Fundamental Change in Land and Farm Policy?
- 8.06 Zvi Lerman and William R. Sutton – Productivity and Efficiency of Small and Large Farms in Moldova.
- 9.06 Bruce Gardner and Zvi Lerman – Agricultural Cooperative Enterprise in the Transition from Socialist Collective Farming.
- 10.06 Zvi Lerman and Dragos Cimpoiu - Duality of Farm Structure in Transition Agriculture: The Case of Moldova.
- 11.06 Yael Kachel and Israel Finkelshtain – Economic Analysis of Cooperation In Fish Marketing. (Hebrew)
- 12.06 Anat Tchetchik, Aliza Fleischer and Israel Finkelshtain – Rural Tourism: Development, Public Intervention and Lessons from the Israeli Experience.
- 13.06 Gregory Brock, Margarita Grazhdaninova, Zvi Lerman, and Vasili Uzun - Technical Efficiency in Russian Agriculture.

- 14.06 Amir Heiman and Oded Lowengart - Ostrich or a Leopard – Communication Response Strategies to Post-Exposure of Negative Information about Health Hazards in Foods
- 15.06 Ayal Kimhi and Ofir D. Rubin – Assessing the Response of Farm Households to Dairy Policy Reform in Israel.
- 16.06 Iddo Kan, Ayal Kimhi and Zvi Lerman – Farm Output, Non-Farm Income, and Commercialization in Rural Georgia.
- 17.06 Aliza Fleishcer and Judith Rivlin – Quality, Quantity and Time Issues in Demand for Vacations.
- 1.07 Joseph Gogodze, Iddo Kan and Ayal Kimhi – Land Reform and Rural Well Being in the Republic of Georgia: 1996-2003.
- 2.07 Uri Shani, Yacov Tsur, Amos Zemel & David Zilberman – Irrigation Production Functions with Water-Capital Substitution.
- 3.07 Masahiko Gemma and Yacov Tsur – The Stabilization Value of Groundwater and Conjunctive Water Management under Uncertainty.
- 4.07 Ayal Kimhi – Does Land Reform in Transition Countries Increase Child Labor? Evidence from the Republic of Georgia.
- 5.07 Larry Karp and Yacov Tsur – Climate Policy When the Distant Future Matters: Catastrophic Events with Hyperbolic Discounting.
- 6.07 Gilad Axelrad and Eli Feinerman – Regional Planning of Wastewater Reuse for Irrigation and River Rehabilitation.
- 7.07 Zvi Lerman – Land Reform, Farm Structure, and Agricultural Performance in CIS Countries.
- 8.07 Ivan Stanchin and Zvi Lerman – Water in Turkmenistan.
- 9.07 Larry Karp and Yacov Tsur – Discounting and Climate Change Policy.
- 10.07 Xinshen Diao, Ariel Dinar, Terry Roe and Yacov Tsur – A General Equilibrium Analysis of Conjunctive Ground and Surface Water Use with an Application To Morocco.
- 11.07 Barry K. Goodwin, Ashok K. Mishra and Ayal Kimhi – Household Time Allocation and Endogenous Farm Structure: Implications for the Design of Agricultural Policies.
- 12.07 Iddo Kan, Arie Leizarowitz and Yacov Tsur - Dynamic-spatial management of coastal aquifers.
- 13.07 Yacov Tsur and Amos Zemel – Climate change policy in a growing economy under catastrophic risks.



- 14.07 Zvi Lerman and David J. Sedik – Productivity and Efficiency of Corporate and Individual Farms in Ukraine.
- 15.07 Zvi Lerman and David J. Sedik – The Role of Land Markets in Improving Rural Incomes.
- 16.07 Ayal Kimhi – Regression-Based Inequality Decomposition: A Critical Review And Application to Farm-Household Income Data.
- 17.07 Ayal Kimhi and Hila Rekah – Are Changes in Farm Size and Labor Allocation Structurally Related? Dynamic Panel Evidence from Israel.
- 18.07 Larry Karp and Yacov Tsur – Time Perspective, Discounting and Climate Change Policy.
- 1.08 Yair Mundlak, Rita Butzer and Donald F. Larson – Heterogeneous Technology and Panel Data: The Case of the Agricultural Production Function.
- 2.08 Zvi Lerman – Tajikistan: An Overview of Land and Farm Structure Reforms.
- 3.08 Dmitry Zvyagintsev, Olga Shick, Eugenia Serova and Zvi Lerman – Diversification of Rural Incomes and Non-Farm Rural Employment: Evidence from Russia.
- 4.08 Dragos Cimpoeies and Zvi Lerman – Land Policy and Farm Efficiency: The Lessons of Moldova.
- 5.08 Ayal Kimhi – Has Debt Restructuring Facilitated Structural Transformation on Israeli Family Farms?.
- 6.08 Yacov Tsur and Amos Zemel – Endogenous Discounting and Climate Policy.
- 7.08 Zvi Lerman – Agricultural Development in Uzbekistan: The Effect of Ongoing Reforms.
- 8.08 Iddo Kan, Ofira Ayalon and Roy Federman – Economic Efficiency of Compost Production: The Case of Israel.
- 9.08 Iddo Kan, David Haim, Mickey Rapoport-Rom and Mordechai Shechter – Environmental Amenities and Optimal Agricultural Land Use: The Case of Israel.
- 10.08 Goetz, Linde, von Cramon-Taubadel, Stephan and Kachel, Yael - Measuring Price Transmission in the International Fresh Fruit and Vegetable Supply Chain: The Case of Israeli Grapefruit Exports to the EU.
- 11.08 Yuval Dolev and Ayal Kimhi – Does Farm Size Really Converge? The Role Of Unobserved Farm Efficiency.
- 12.08 Jonathan Kaminski – Changing Incentives to Sow Cotton for African Farmers: Evidence from the Burkina Faso Reform.
- 13.08 Jonathan Kaminski – Wealth, Living Standards and Perceptions in a Cotton Economy: Evidence from the Cotton Reform in Burkina Faso.

14.08 Arthur Fishman, Israel Finkelshtain, Avi Simhon & Nira Yacouel – The Economics of Collective Brands.

15.08 Zvi Lerman - Farm Debt in Transition: The Problem and Possible Solutions.