

3. Availability and Use of Agricultural Inputs and Credit

A. *General Trends in the Availability and Use of Agricultural Inputs*

3.1 During the last decade, the trends in the use of the main agricultural inputs analyzed in this chapter, fertilizer and agro-chemicals, have been fairly similar. The use of both fertilizer and agro-chemicals hit lows in 1994, falling by 20 to 25 percent below their peak levels of the early 1990s. In the late 1990s, they both increased steadily to new peak usage levels in 1997-1999. In the reform period of 2000-2002, both fertilizer and agro-chemical usage apparently fell back by 25-30 percent to levels seen in the early to mid-1990s. Annually, Turkish agriculture currently consumes roughly 10 thousand tons of insecticides, 10 thousand tons of pesticides, 5 thousand tons of herbicides, 25 thousand tons of sulfur and sulfates, and 4.5 million tons of chemical fertilizers on an average area of 21.5 million hectares planted to field crops, fruits and vegetables.

3.2 In terms of fuel for agriculture, there are only rough estimates of consumption, based on areas and types of crops planted. In this respect, informal estimates of the Ministry of Agriculture and Rural Affairs (MARA) and the Turkish Chamber of Agricultural Producers (TZOB) differ significantly, the former being 1.9 million tons, and the latter 2.5 million tons. TZOB estimates for 1999-2001 show that fuel consumption fell only about 2 percent.

3.3 Fertilizers and agricultural chemicals are normally readily available in Turkey. However, there tends to be more variety in agricultural chemicals, and their consumption is more concentrated in the better-off regions of Marmara, Aegean and the Mediterranean. It is estimated that while these regions consume 42 percent of total fertilizer, they consume roughly 70 percent of the total agricultural chemicals⁹. There may be, therefore, instances where difficulties may be encountered in obtaining specific agricultural chemicals, especially in the east of Turkey.

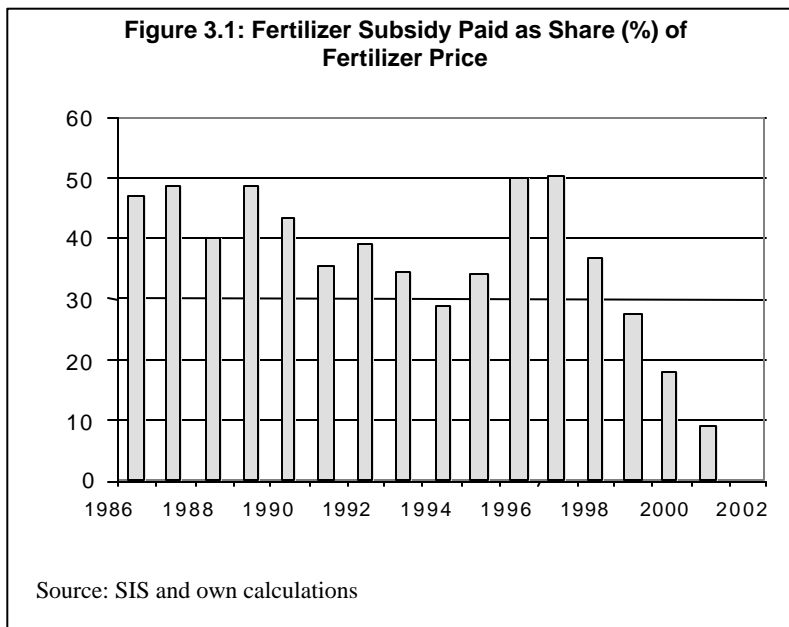
B. *Specific Case of Availability and Use of Fertilizers*

3.4 Fertilizer subsidies were paid to producers and suppliers rather than farmers, except for a brief period between 1994 and 1997. Fertilizer is the most important agricultural input, after fuel, in terms of outlays by farmers in Turkey. Prior to 1986, fertilizer production and distribution was carried out by the Turkish Agricultural Supplies Institute (TZDK) and the Sugar Corporation under state monopoly. After the 1986 reforms, this monopoly was abolished and competition began among private companies. Agricultural Credit Cooperatives were also promoted by government to fill in the resulting gap. Between 1986-1994, the state followed a policy of giving fertilizer subsidies to fertilizer producers and to cooperatives, but not directly to farmers. Between 1994-97, the system was altered to one of direct price subsidies to farmers. However,

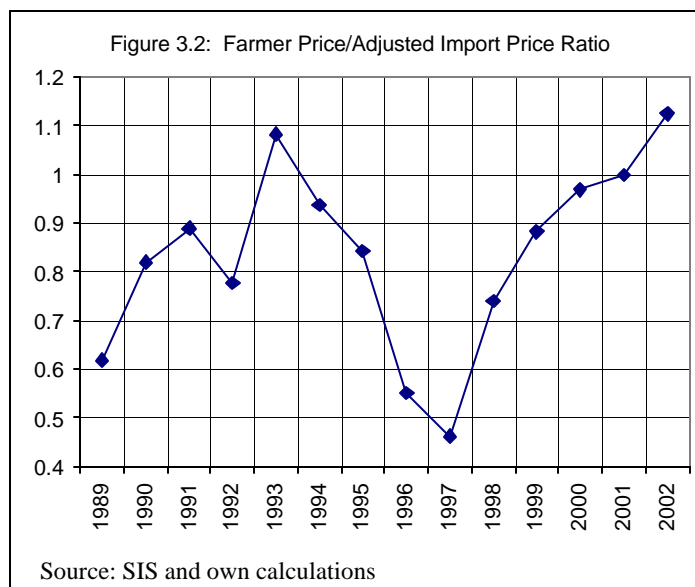
⁹ While we do not have detailed regional consumption figures for agricultural chemicals, we do have figures for ACC sales. For the ACCs, fertilizer consumption in the better-off regions of Marmara, Aegean and Mediterranean were 42 percent for the total of ACC fertilizer sales, corresponding with the same ratio of total regional fertilizer sales to Turkey as a whole. Regarding agricultural chemicals, ACC consumption in the better-off regions of Marmara, Aegean and Mediterranean were 73 percent for the total of ACC agricultural chemical sales. In 1997-2000, these three regions accounted for a stable 47-49 percent share of value added in agriculture.

owing to difficulty in handling subsidy payments that were based on fertilizer sales invoices and periodic fraud in these transactions, the direct payment system was discontinued.

3.5 Starting in 1997, GOT phased out fertilizer subsidy payments. In 1997, the system reverted to indirect support policies of 1986-94, with the use of intermediary institutions. Subsidies and support declined from 1997 onwards as the subsidy amount was fixed in nominal terms (e.g. 30,000 TL/kg of di-ammonium phosphate fertilizer). While the subsidy was about 50 percent of the fertilizer price in 1997, it fell to 10 percent of the price in 2001. The fertilizer subsidy was completely abolished on November 1, 2001.



3.6 For most of the 1990s, farmers paid below input parity prices for fertilizer. Farm gate fertilizer prices have now adjusted to import prices. Overall, the price subsidy for fertilizer was not uniform over the period 1986-2001 (Figure 3.1). Moreover, the incidence of the subsidy was not always fully with farmers. During 1986-1994, when the state followed a policy of giving fertilizer subsidies directly to fertilizer producers, this approach effectively established an oligopoly¹⁰ in the Turkish fertilizer sector -- four leading fertilizer producers were responsible for 95 percent of the total production. Thus, in spite of the continued high levels of support ranging from 30 to 50 percent of total value, the farmer fertilizer price was not proportionally lower than the import price except for the brief period 1995-1997 (Figure 3.2). This brief period, in fact, coincides with the time when payments were made directly to farmers.



3.7 It is also noteworthy that the 1997 system was skewed in favor of fertilizer producing firms rather than the other suppliers. Fertilizer producers received part of the subsidy as advance payment three

¹⁰ Large trading margins along with import duties largely offset the subsidies intended for farmers. In 1994, one expert estimated that trade barriers kept retail prices comparable to border prices despite US \$400 million in subsidies, which were "half of the [retail] value of the fertilizers;" Gencaga 1994, p. 3.

months before the actual production of fertilizer, whereas other suppliers, including ACCs, had to furnish proof of their sales before they could receive the subsidy. Therefore, in view of the constantly high levels of inflation, producers were placed in an advantageous position.

3.8 After falling steeply in 2000-2001, domestic fertilizer consumption is starting to recover. This drop was significantly amplified in the less developed regions of Turkey, particularly in the East and the Northeast. In the least developed provinces, fertilizer consumption fell by 45 percent between 1998 and 2002. However, there was little negative impact in South Eastern Turkey, due to increased land use under the Southeast Anatolia Project (GAP).

3.9 With the subsidy phase-out, fertilizer producers expanded their market share at the expense of cooperative suppliers. There is increasing concentration in the fertilizer sector. Six main private sector and SOE fertilizer companies have increased their market shares, from 53 percent in 2000 to 63 percent in 2002. Significantly, the market share of the ACCs has plummeted from 30 to 12 percent. On the other hand, market share of two relatively minor players in the cooperative sector, that of Pankobirlik (beet growers) as well as ASCUs have increased, offsetting the decline in the market share of the cooperatives. The share of other suppliers has increased from 7.7 to 10.9 percent over the past three years. Most probably, new firms will start entering the market and some of the smaller players will start to gain significance.

3.10 To investigate the characteristics of fertilizer demand, we have econometrically estimated regional fertilizer consumption in Turkey as a function of agricultural GDP, land used, and real fertilizer price. The results of this analysis (carried out on provincial level annual data from 1997 to 2000) are given in Table 3.2 below.

	2000	2001	2002
Cooperatives			
ACCs	30.47	17.91	11.62
ASCUs	3.68	6.26	5.37
Pankobirlik	0.81	9.08	9.566
<i>Total coops</i>	<i>34.97</i>	<i>33.25</i>	<i>26.54</i>
Private sector / SOEs			
TÜGSAS (SOE)	10.49	11.22	11.00
IGSAS (SOE)	5.58	7.23	6.62
GÜBRETAS	3.48	5.78	6.47
BAGFAS	7.71	8.97	9.59
EGE GÜBRE	2.83	3.40	4.90
TOROS	23.40	20.34	23.97
<i>Total 6 biggest</i>	<i>53.48</i>	<i>56.94</i>	<i>62.54</i>
Public sector			
SEKER FAB.	3.85	0.06	0.00
Other	7.70	9.76	10.92
TOTAL	100.00	100.00	100.00

Source: SIS, TZOB, and own calculations

	Real agricultural GDP	Real fertilizer price	Planted area
Eastern Anatolia	0.82**	-1.82**	0.32*
Aegean	0.54**	-0.56**	0.53**
Southeast Anatolia	0.45**	-0.24	0.70**
Black Sea	0.40**	-0.74	0.71**
Mediterranean	-0.15	-0.16	1.82**
Marmara	-0.13	-0.19	1.14**
Central Anatolia	0.35**	-0.85**	0.68**
Turkey	0.48**	-0.66**	0.63**

Source: SIS, TZOB, and own calculations. *Significant at 95 confidence interval ** Significant at 99 confidence interval

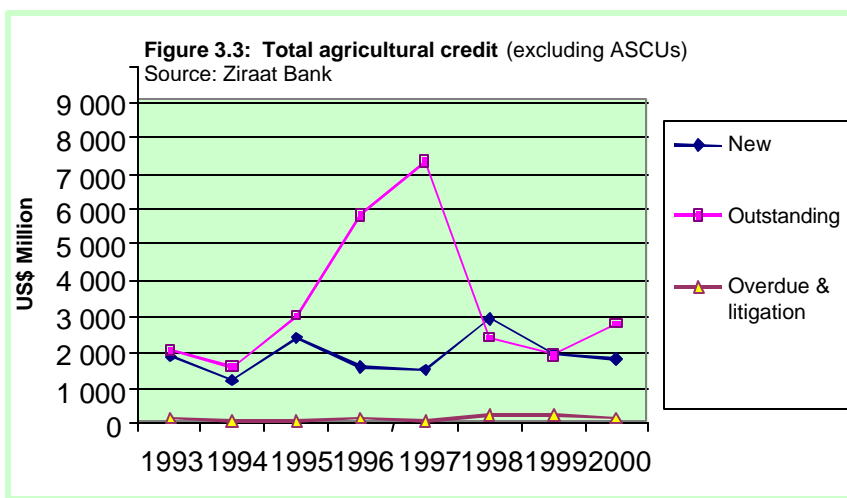
3.11 Eastern Anatolia is the only region which is price elastic, (an elasticity “e” of -1.82), followed by the Black Sea Region (e = - 0.74), and the Aegean (e = -0.56). The most price inelastic regions are the Mediterranean and Marmara. None of the regions in Turkey are income elastic in fertilizer consumption, but the income elasticity of fertilizer consumption in the Eastern Anatolia region is the highest (e=0.82), followed by the Aegean (e=0.54). Again, the most inelastic regions are the Mediterranean and Marmara. The Mediterranean and the Marmara Regions are both land elastic (with elasticities of 1.82 and 1.14 respectively), while Eastern Anatolia is the least land elastic (e=.32), followed by the Aegean (e=.53).

3.12 In sum, the Eastern Anatolia region and eastern parts of the Black Sea region, being some of the least developed areas of Turkey, are the regions in which input usage has been most significantly affected, as demand is both price and income elastic, as well as rather inelastic with respect to expansion of area. The most resilient regions, on the other hand, are the Mediterranean and the Marmara, which are land elastic regions coupled with price and income inelasticity. The Aegean region, which is one of the richer agricultural regions of Turkey, nevertheless seems to demonstrate the same type of elasticity pattern as that of the East Anatolia region. This indicates a certain degree of inherent fragility of input demand there.

3.13 Data available on numbers of registered fertilizer distributors indicates that fertilizer is widely and fairly evenly available across Turkey. There are 6000 registered distributors across Turkey, of which 2,255 are primary level ACCs. In Eastern Anatolia (the most remote region), ACCs represent 39 percent of the total distributors in that region, compared to the ACC average for the whole of Turkey, which is 37 percent.

3.14 Unbalanced fertilizer application remains pervasive, especially among less commercial farmers and regions.

In the year 2000, Turkey used 65 percent of what it needs in terms of nitrogenous fertilizers and 45 per cent of the requirements for phosphorous fertilizers.¹¹ While these figures are definitely below the soil requirements, well-informed anecdotal evidence¹² strongly points towards generalized unbalanced application – serious overuse on commercial farms and very little application on smaller, poorer holdings. In terms of sustainability, therefore, fertilizer use needs to be reviewed with care and further studies and surveys are required to get a clearer picture. In regional terms, the highest rates of application relative to soil requirements for nitrogenous and



¹¹ Turkey Fertilizer Requirements, Consumption and its Future, Fikret Eyuboglu, GDRS, MARA Publication, Ankara 2002.

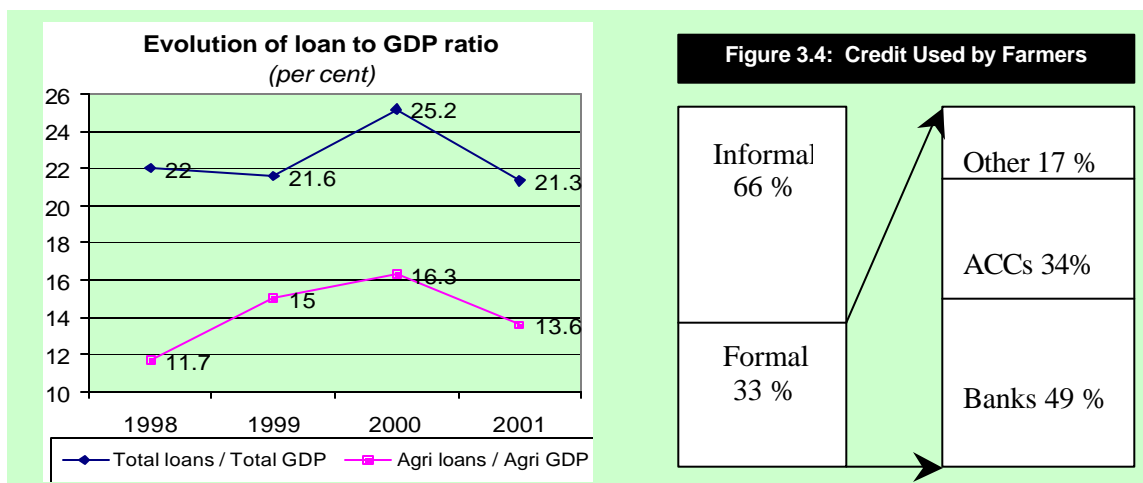
¹² Soil and Fertilizer Research Institute, GDRS – MARA.

phosphorous fertilizers¹³ are in Marmara (75.5% and 72.5% respectively) and the Mediterranean (69% and 53.5% respectively).

C. Systems of Credit for Inputs

3.15 Formal agricultural credit expanded rapidly until 1997, however it still remains low by international standards. Through the formal sector Turkey has had an annual average agricultural credit portfolio of US \$5.4 billion over the last decade. Out of this, approximately US \$2 billion is the annual average of new credits. In 1994-1997, the formal sector agricultural portfolio increased significantly, reaching US \$7.3 billion in 1997.¹⁴ In 1998-2001, this loan portfolio dropped to an annual level of only US \$2 to 3 billion.

3.16 Over this same period, the ratio of formal agricultural lending to agricultural GDP was about 14 percent, which is below both the Turkish lending average for the economy as a whole (23 percent) and international comparator levels¹⁵ for agricultural credit (30 percent). Formal agricultural credit is low since it is estimated that only a third of the total agricultural credit comes from the formal sector (Figure 3.4).



Source: "Strategic Review of Ziraat Bank in the Provision of Agricultural Finance in Turkey" Rabo International Advisory Services and Boston Consulting Group.

3.17 Directed agricultural credit through Ziraat Bank and the Agricultural Credit Cooperatives (ACC) dominate formal agricultural lending. Until 2002, Ziraat and the ACC had been the principal actors in the agricultural credit field, as they were the main conduits for channeling Treasury-supplied credit to farmers. In 2001, out of the US \$2.8 billion of total credit, US \$1.8 billion were Treasury-sourced credit, US \$0.5 billion of Ziraat's own sources, and US \$0.4 billion of ACC's own sources. Other minor players included the ASCU's, (US \$85 million of agricultural credit in 2000/1), and Pankobirlik (Sugarbeet Growers Cooperative Union –US \$35

¹³ Turkey Fertilizer Requirements, Consumption and its Future, Fikret Eyuboglu, GDRS, MARA Publication, Ankara 2002.

¹⁴ These figures, for our purposes, intentionally exclude credits to ASCUs. ASCU credits being the main vehicle for the administration of price subsidy schemes for export commodities, their deficits were covered by credits each year. While ASCUs do also give out production credit to their members (US \$66 million in 2001), the actual size of commodity price subsidy confuses the picture.

¹⁵ Agricultural credit to agricultural GDP ratios: average of Brazil, Greece, Malaysia and Thailand is 30 percent.

million of agricultural credit in 2002). Involvement by other banks was negligible.¹⁶ In 2002 the Treasury ceased supplying funds to Ziraat Bank and the ACC system.

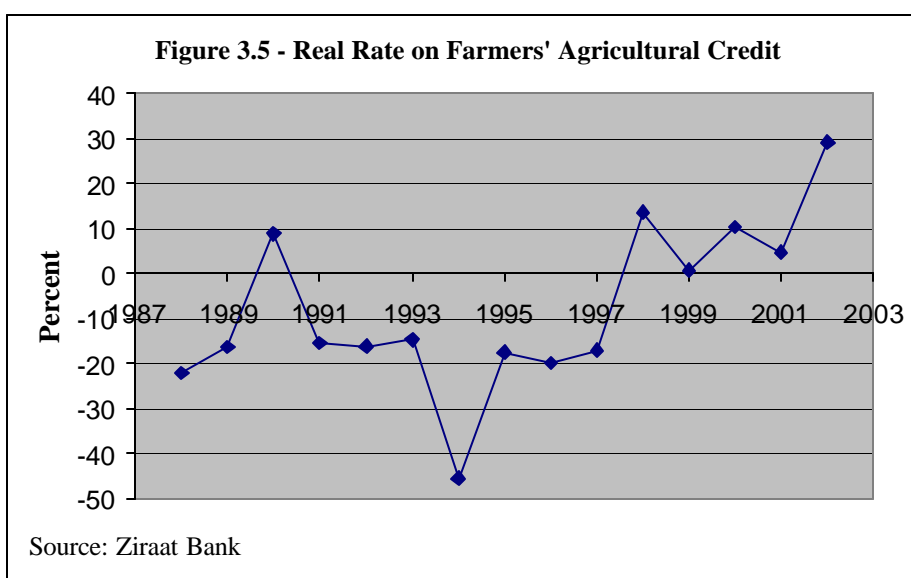
3.18 Ziraat Bank focused on larger farmers and SOEs, while the ACCs served smaller-scale farmers. The current restructuring of Ziraat has called into question Ziraat’s own specificity and direction, as well as its relationship with the ACCs. Ziraat has tried to reduce its agricultural loans, call back delinquent loans, and re-define its clientele. As well, state-owned enterprises, which were once a major recipient representing 70 percent of Ziraat-sourced loans in 1997, now represent a very minor proportion of Ziraat’s loan portfolio.

Table 3.3: Ziraat Bank and ACC Loans to Farmers in 2001

	Loans to farmers	Number of farmers	Average size of loan
Ziraat Bank	US\$539 million	374,000	US\$1441
ACCs	US\$502 million (of which US\$149 from Ziraat)	800,000	US\$627

Source: Ziraat Bank, ACC Central Union

3.19 Originally intended as the retailing arm of the Ziraat Bank for the small scale farming sector in Turkey, ACCs service a larger number of farmers, who are mostly small-scale farmers – 800,000 farmers compared with 374,000 directly serviced by Ziraat. During this period, ACC farmer members



had the right to use credit up to a pre-defined ceiling (TL 2.25 billion in 2002 being roughly US \$1,500), uniform for all members. Agricultural credit was given 80 percent in kind, and mostly as fertilizers. No such ceilings were in existence in Ziraat, allowing them to service the larger farmers.

3.20 Prior to the 1999 reforms, interest rates were heavily subsidized. The Government also heavily subsidized the agricultural input sector through the provision of cheap credit. Between 1988 and 2002, real interest rates were negative up to 1998 (Figure 3.5), averaging about -20 percent per year. The subsidy element is also evident in the comparison between interest on

¹⁶ Sekerbank, previously linked to Pankobirlik, reduced its agricultural portfolio from US \$8 to \$4 million from 2000 to 2001. Is Bankasi, one of the largest commercial banks in Turkey, is running a pilot program for commercial farmers in the Manisa (Aegean) province. Tarisbank encountered problems and was taken over by the Banking Supervisory Authority.

savings accounts and agricultural credit, the latter having been consistently below the former up to the year 2001 (Figure 3.6).

3.21 Real interest rates became positive in 1998 and have continued to be positive since then. During 2001-2002, they reached unviable levels of over 100 percent in nominal terms, and 30 percent in real terms.

3.22 Cheap and abundant credit discouraged credit discipline in the agricultural sector and contributed greatly to unprofitability of farm lending and Ziraat Bank and ACC insolvency. It is also worthwhile to note that there has been a growing tendency

towards credit delinquency since 1994-5, both in the credits given out by Ziraat and the ACC system. In fact, the increase in credit delinquency corresponds to another recent trend in the rural credit market, namely that of frequent debt rescheduling schemes involving implicit debt write-offs to farmers. The pursuit of support (“vote getting”) by active political parties has consistently increased farmer expectations during election periods, and played a major role in building up the growing scale of overdue credit in the system, and required the debt re-scheduling as a fulfillment of campaign promises by past government collation parties.

3.23 High real interest rates and lower agricultural profitability prompted by the 2000 reforms worsened the financial viability of Ziraat Bank and the ACCs. However, the possibility of other economic factors being at work must not be overlooked. First, higher real interest rates have clearly reduced the debt carrying capacity of farmers. Given the uncertainty of the timing of debt forgiveness, farmers have often taken on excessive debt and delayed repayment, then incurred penalties and capitalization of outstanding interest into their debt balances. With

increasing real interest rates the cycle of reduced creditworthiness and inability to repay was further accelerated. The decreasing terms of trade of agriculture in the 2000-2002 period have also reduced debt carrying capacity and increased the pressure by farmers on the Government for debt-rescheduling.

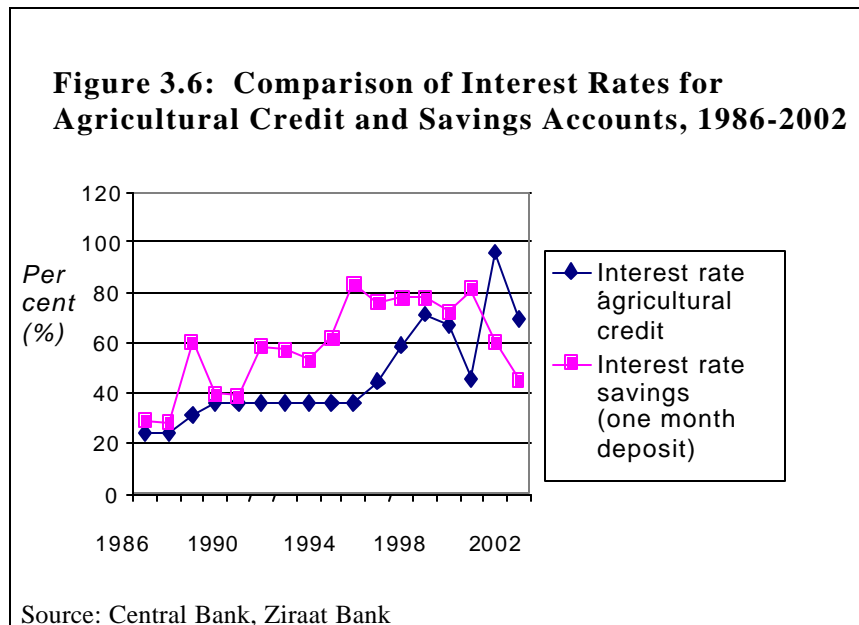
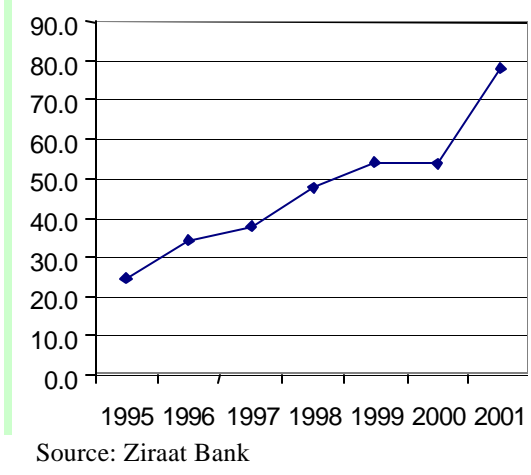


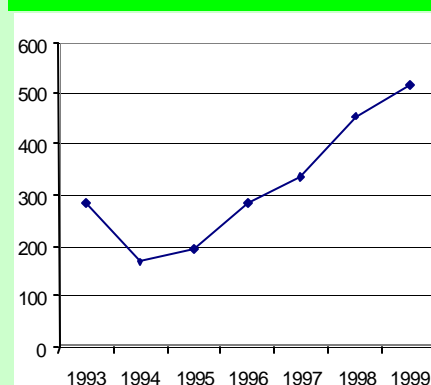
Figure 3.7: ACCs - Credits Overdue and in Litigation (percentage of total credit)



3.24 Ziraat's credits overdue and under litigation increased from TL 169 trillion to TL 516 trillion in real terms between 1994 and 1999 -- a three-fold increase over five years. Equally, on the ACC side, credits overdue and under litigation increased from 25 percent in 1995 to the dramatic 78 percent in 2001, which finally blocked the ability of the system to extend new credits in 2002.

3.25 Two points also need to be raised in this regard. First, one cannot overlook the possibility that a properly re-structured and independent ACC system would become a serious rival to Ziraat. While Ziraat would ideally like to leave farms with annual revenues of less than US \$7,500 to the ACCs, and focus on the better-off farmers, about half of Ziraat's present clientele is within this low-income segment. The next income bracket of US \$7,500 to 15,000 is also small-scale farmers, well within the reach of the ACCs. These two segments together represent 90 percent of the current Ziraat portfolio.

Figure 3.8: ZIRAAT: Credits overdue and in Litigation (real 2002 Trillion TL, exc. ACCs)



Source: Ziraat Bank

3.26 Second, it is highly probable that small- and medium-scale farmers have used the available agricultural credit more as a low-interest credit line both for agriculture and for their general purposes, indirectly and partly as a substitute for rural credit especially in the eastern parts of the country, due to the fungible nature of money. There is some evidence in this respect¹⁷, linking the ACC market share in fertilizers to the availability of the ACC credit (standard credit ceiling per farmer, as well as rates of credit overdue and under litigation) and to some extent to the real rate of interest. In other words, farmers have ideally tried to use their credit line to the fullest, unless the interest rates became truly unattractive.

3.27 In sum, the formal sector agricultural lending portfolio contracted quickly in the reform period from the time real interest rates were introduced. Both main lenders, Ziraat Bank and the ACCs, have reduced their exposure as flows of credit resources from the Treasury have been discontinued. Delinquency by agricultural borrowers has increased for three main reasons: (a) reductions in agricultural income; (b) high real interest rates; and (c) an expectation by some farmers for partial debt forgiveness.¹⁸ Given the increasing problems with delinquency in the farming sector, Ziraat Bank is attempting to diversify its lending out of agriculture. The impact of loan delinquency on the ACCs has been to reduce loanable funds. This proceeded to the point in 2002 where the ACC system was unable to extend virtually any new credits at all.

¹⁷ Regression of ACC market share in fertilizer from 1990-2001: Correlated with real credit limit (P-value 2 percent), and with Credit delinquency rate (P-value 1 percent), weakly correlated with real interest rate (P-value 7 percent). Overall regression significant at 2.6 percent level, with R2=67 percent, with a total of 12 observations and 9 degrees of freedom. More data, however, is required to verify this preliminary result.

¹⁸ In early June 2002, the Government announced a farmers' debt reduction package worth about US \$1.15 billion, reducing the value of farmer' outstanding loans and interest to Ziraat Bank and the ACCs by US \$550 million and US \$600 million, respectively.