האוניברסיטה העברית בירושלים

The Hebrew University of Jerusalem

המחלקה לכלכלה חקלאית ומנהל

The Department of Agricultural Economics and Management

המרכז למחקר בכלכלה חקלאית

The Center for Agricultural Economic Research

Discussion Paper No. 5.17

Transition to Smallholder Agriculture in Central Asia

by

Zvi Lerman and David Sedik

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/index.html

P.O. Box 12, Rehovot 76100, Israel

ת.ד. 12, רחובות 76100

Transition to Smallholder Agriculture in Central Asia

Zvi Lerman and David Sedik[1]

Abstract

The article reviews the development and the present status of smallholder farming in Central Asia's former Soviet republics -- Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. One of the striking features of the transition in CIS agriculture in general, and in Central Asia in particular, is the dramatic shift, since 1992, from the predominance of large corporate farms ("agricultural enterprises") to individual or family agriculture based on a spectrum of small farms (household plots and peasant farms). As of 2017, the individual sector accounts for most of agricultural production and controls a large share of arable land. This is a dramatic change from the pre-1990 period, when agricultural enterprises produced over 70% of GAO and controlled over 90% of arable land. In this article, we assemble evidence that, in our opinion, shows that individualization of agriculture is associated with the post-transition recovery in Central Asia (and in CIS in general) and that small family farms outperform the large enterprises. This clashes with the traditional Soviet philosophy of economies of scale and with the inherited ideology that views small family farms as an undesirable deviation from the capital-intensive, highly mechanized, and commercially oriented mainstream. We discuss the specific policies in the five countries that helped smallholder farms in Kazakhstan, Kyrgyzstan, and Tajikistan and severely restricted their growth and development in Uzbekistan and especially Turkmenistan.

Introduction

The five countries of Central Asia – Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan – became independent states in 1991-1992 with the dissolution of the Soviet Union. After assuming independence, the Central Asian countries haltingly embarked (together with the rest of the CIS) on a program of reforms intended to achieve a transition from a command economy to an economy more in line with market principles (Lerman et al. 2004). The specific content and direction of the reforms in the agricultural sector were changed and adjusted over the years, but overall they aimed to eliminate the traditionally wasteful use of resources and thus improve productivity. For countries that in 1990 derived more than 30% of GDP from agriculture, improved agricultural performance was naturally expected to boost household incomes, especially in the poor rural areas. These goals were to be accomplished through the process of land reform and farm restructuring, implemented simultaneously with price and trade policy reforms. The reforms were basically expected to change the producer incentives, strengthening profit orientation and thus increasing personal involvement and motivation.

One of the striking features of transition from plan to market in CIS agriculture is the dramatic shift from the predominance of large corporate farms (kolkhozy and sovkhozy, generally referred to as agricultural enterprises) to individual or family agriculture based on a spectrum of small farms. The individual sector, combining the traditional household plots and the new peasant farms that began to emerge after 1992, accounts for most of agricultural

[1] Zvi Lerman is Professor Emeritus of Agricultural Economics, Department of Environmental Economics and Management, Hebrew University of Jerusalem, Israel; David Sedik is currently Senior Policy Officer, FAO Regional Office for the Near East and North Africa, Cairo, Egypt.

production and controls a large share of arable land. This is a dramatic change from the pre-1990 period, when agricultural enterprises produced over 70% of GAO and controlled over 90% of arable land (see **Table 1**).

These changes of farm structure, while consistent with the dominant mode in market agricultures, clash with the traditional Soviet philosophy of economies of scale. They also clash with the inherited ideology that views small family farms as an undesirable and even damaging deviation from the capital-intensive, highly mechanized, and commercially oriented mainstream. We therefore witness an ongoing debate, both among CIS decision makers and within the CIS academic community, as to the performance advantages of the two main organizational forms in agriculture – large corporate farms and small family farms.

This continuing debate in effect ignores the well-known theoretical considerations that reveal clearly identifiable advantages of small family farms compared with large corporate farms (Allen and Lueck 2002). There is generally no evidence of economies of scale in primary agricultural production, while individual or family farms are easier to organize and operate than corporations. Family farms are free from labor monitoring costs and are not prone to agency problems, contrary to large corporate farms employing hired labor and run by outside managers. These factors highlight the importance of individual incentives for farm efficiency and account for the predominance of family farms in market economies, where a family farm is not necessarily a very small farm: the optimal farm size is determined in each particular case by the managerial capacity of the farmer, and it may be quite large for highly capable individuals. Yet, we should not ignore the evidence that excessive fragmentation, as often observed in CIS, reduces farm efficiency (Blarel et al. 1992; Lerman 2005) and policy measures are desirable to facilitate consolidation of "very small" land plots into "slightly larger" plots by market mechanisms (Lerman and Cimpoies 2006; Lerman and Sutton 2008).

In this study we assemble evidence that, in our opinion, shows that individualization of agriculture is associated with the post-transition recovery in CIS and that small family farms outperform the large enterprises, at least by measures of land productivity. The evidence is presented here for the five countries of Central Asia—Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. Previously, similar results have been obtained for the Trans-Caucasian states –Armenia, Georgia, and Azerbaijan (Lerman and Sedik 2010; Lerman 2006) and to a certain extent also for the European countries of the CIS (Lerman and Sedik 2013; Lerman and Sutton 2008; Lerman et al. 2007). Among market economies, in the United States, large (corporate) farms have been shown to be less productive than small (family) farms (Ahearn et al. 2002), i.e., contrary to expectations, a type of diseconomies of size is operating on average. Before marshaling our evidence, which comes primarily from official country statistics, we start with a short section that sets the regional context by discussing the importance of agriculture in Central Asia.

The three phases of agricultural development and the turnaround point

Central Asia, as a region, has gone through three phases of agricultural development during the last 50 years (**Figure 1, thick black curve**). The first phase can be characterized as the Soviet growth period, which was sustained by the stable supportive environment that characterized the post-Stalin attitude toward agriculture in the USSR. The Soviet growth phase extended until 1990, when the GAO index had risen to 225% of its level in 1965. The second phase is the transition collapse triggered by the dismantling of the traditional Soviet system and the disruption of all support services in agriculture. The GAO index dropped by

almost 40% between 1990 and 1998, bottoming out in 1998 at about the level of 1975. The third phase is the recovery phase characterized by renewed agricultural growth after 1998, when the cumulative effect of sustained market reforms began to be felt.

Figure 1 superimposes the agricultural growth curves for Central Asia and two other regions: Trans-Caucasus and the European CIS. The three phases of long-term agricultural development – growth, collapse, and recovery – are clearly visible in each regional curve. The notable difference is the shift of the point where recovery starts: as early as 1993 in Trans-Caucasus, 1998 in Central Asia, and 1999 in the European CIS.

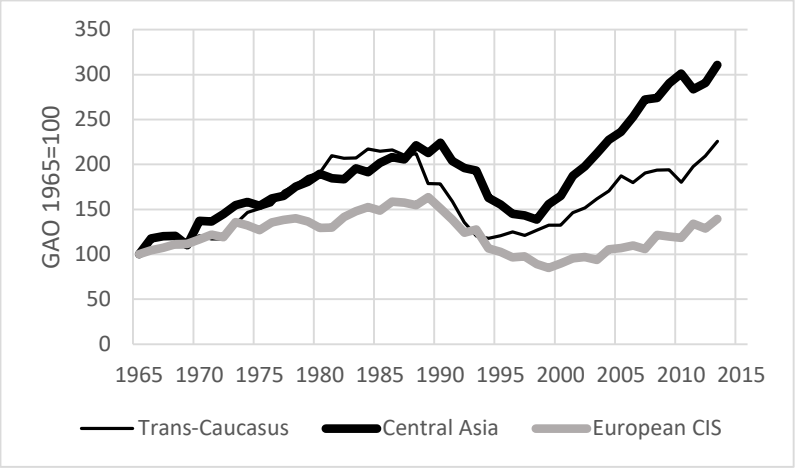
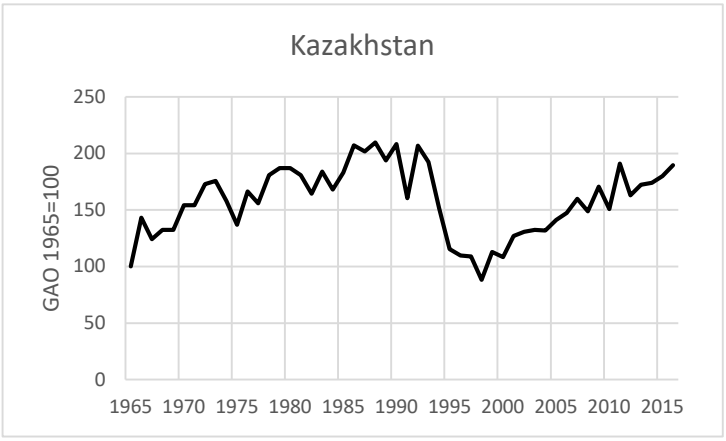


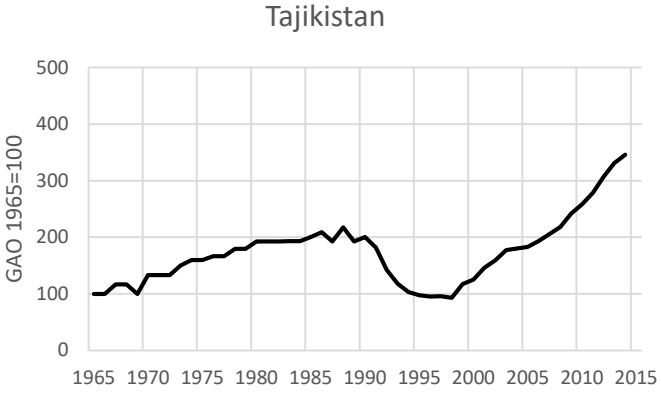
Figure 1. Regional GAO growth 1965-2013: averages for three regional groupings of CIS countries. Source: official country statistics and CISSTAT (2014).

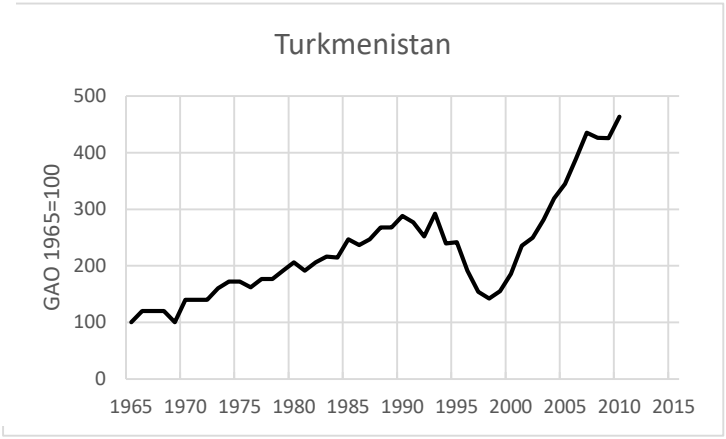
There is a traceable link between the beginning of recovery and the implementation of significant farm structure reforms. In the Trans-Caucasus recovery started in 1993, precisely when two of the three Trans-Caucasian countries – Armenia and Georgia –made resolute efforts to dismantle collective agriculture and distribute land to individual farms at the very beginning of transition (Lerman 2006). The rate of recovery in Trans-Caucasus subsequently accelerated after 1996, when Azerbaijan adopted a farm individualization policy as part of President Aliyev's reforms (Lerman and Sedik 2010): this acceleration is clearly visible in the steeper slope of the Trans-Caucasus curve in **Figure 1** from 1997 onward. It is sometimes argued that Azerbaijan's agricultural success since 1996 is simply a reflection of the booming oil revenues that fuel the overall economic growth. Armenia and Georgia do not have any oil revenues, and yet the starting point for agricultural recovery in these countries is clearly linked with the implementation of land individualization reforms. In the European CIS, recovery began around 1999, as two of the four countries – Ukraine and Moldova – began moving in earnest toward distribution of land plots to holders of paper land shares (Lerman et al. 2007; Lerman and Sutton 2008). The extent of the recovery in this group is moderate, because two other countries – Russia and Belarus – have not done much by way of actual land reform (Lerman and Sedik 2013; Csaki et al. 2000).

The recovery in Central Asia as a region began in 1998 (see **Figure 1**), by which time all five countries had moved toward implementing various reform measures in various ways. Looking at the detailed country patterns (**Figure 2**), we note that in three of the five cases – Kazakhstan, Tajikistan, and Kyrgyzstan – the actual turnaround from decline to recovery indeed came in 1998. In Kyrgyzstan and Uzbekistan, on the other hand, the turnaround came earlier (1995 and 1996, respectively), but the advanced contribution of these two countries to overall recovery is masked in the average regional curve by the majority with 1998 turnaround. The different timing of the turnaround point is explicitly linked to adoption of significant land reform legislation in different countries, as demonstrated in **Table 3** below.

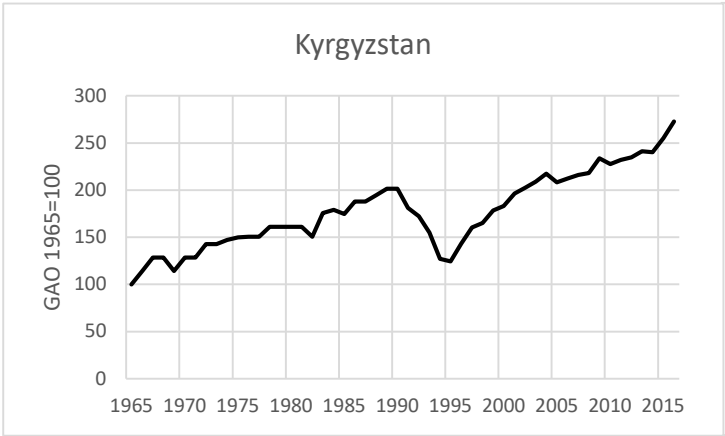
1998 turnaround







1995-1996 turnaround



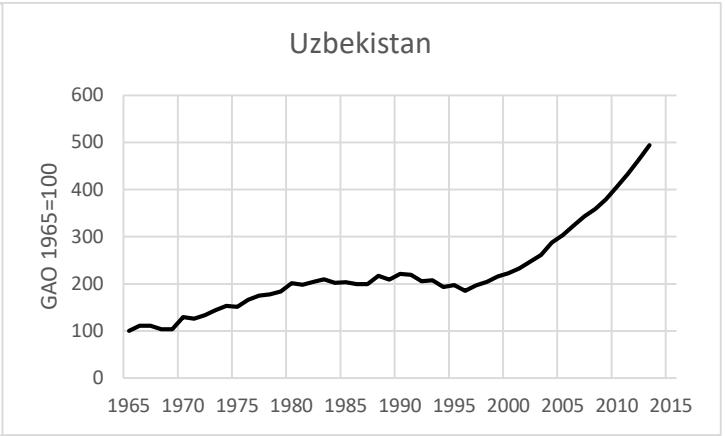


Figure 2. Turnaround points for Central Asian countries: Kazakhstan, Tajikistan, Turkmenistan (1998 turnaround), Kyrgyzstan (1995) and Uzbekistan (1996). Source: official country statistics.

Individualization of Central Asian agriculture

During the Soviet era, the farming structure in all the former republics of the USSR was dominated by large agricultural enterprises—collective and state farms, which coexisted with small household plots cultivated by the rural population—the traditional "private" sector of Soviet agriculture (Waedkin 1973). The large enterprises produced most of the commercially traded output, while the household plots were largely subsistence oriented and sold only their surplus output that remained after satisfying the family's needs for food.

Two changes began to be implemented in this dual farming structure already in the early 1990s: the household plots were substantially enlarged by additional land allocations from the state and a totally new organizational form—the "peasant farm"—emerged after 1992. While household plots were typically managed on a part time basis by workers of agricultural enterprises, rural administrative employees, or pensioners and had many symbiotic links with the local agricultural enterprise, peasant farms were created as independent entities outside the existing collectivist framework. They were substantially larger than the household plots (although much smaller than the agricultural enterprises) and, unlike household plots, they had a clear commercial orientation. As a result, the dual farming structure that prevailed during the Soviet period evolved into a three-component structure: a "private" or individual sector that now consisted of both household plots and peasant farms and the corporate enterprise sector inherited from the Soviet era. We refer to this process involving enlargement of household plots and creation of new peasant farms as "conventional" land individualization.

It is important to note that individualization of land tenure is different from privatization of legal ownership of land. First, land can be privatized only in countries that legally recognize private ownership of agricultural land, i.e., Kazakhstan and Kyrgyzstan. In Tajikistan and Uzbekistan all land remains state owned and it is transferred to farmers in use rights. Turkmenistan formally recognizes private land ownership (with severe transferability restrictions), but virtually all land in the country is owned by the state and is given to farmers in use rights, as in Tajikistan and Uzbekistan where no private land ownership is recognized. Second, new landowners may decide not to farm their privatized land individually and instead transfer it to others for farming through various lease or rental arrangements. This is the experience in many Central and Eastern European countries, where land privatization often created absentee landowners with more lucrative jobs in the city, or alternatively, in countries such as Moldova or Romania, where the new landowners, while residing in rural areas and relying mainly on income from agriculture, felt unprepared to assume the risks of individual farming and therefore entrusted their land under contract to others, both individuals and corporations. Private land owners and individual farmers are therefore two different groups of people with only partial overlap.

Since land resources in each country are inherently limited, the enlargement of household plots and the creation of new peasant farms have necessarily come at the expense of the agricultural enterprises, which lost much of their land to the individual sector. **Figure 3** illustrates the shift of arable land from corporate farms (enterprises) to the individual sector (household plots and peasant farms) in four of the five Central Asian states, which adhered to the process of reform as described above. In all four countries we witness substantial expansion of the individual sector and the corporate farms have clearly lost their dominant position. Kazakhstan is somewhat of an outlier in three respects: first, this is the only country that suffered from significant shrinkage of arable land inventories through abandonment; second, the household sector in Kazakhstan controls a much smaller proportion of land than in the other countries; and third, the corporate sector continues to retain a much greater share of arable land than in the other countries. Still, the share of corporate farms in arable land in Kazakhstan went down from virtually 100% in 1990-91 to about 60% in 2007.

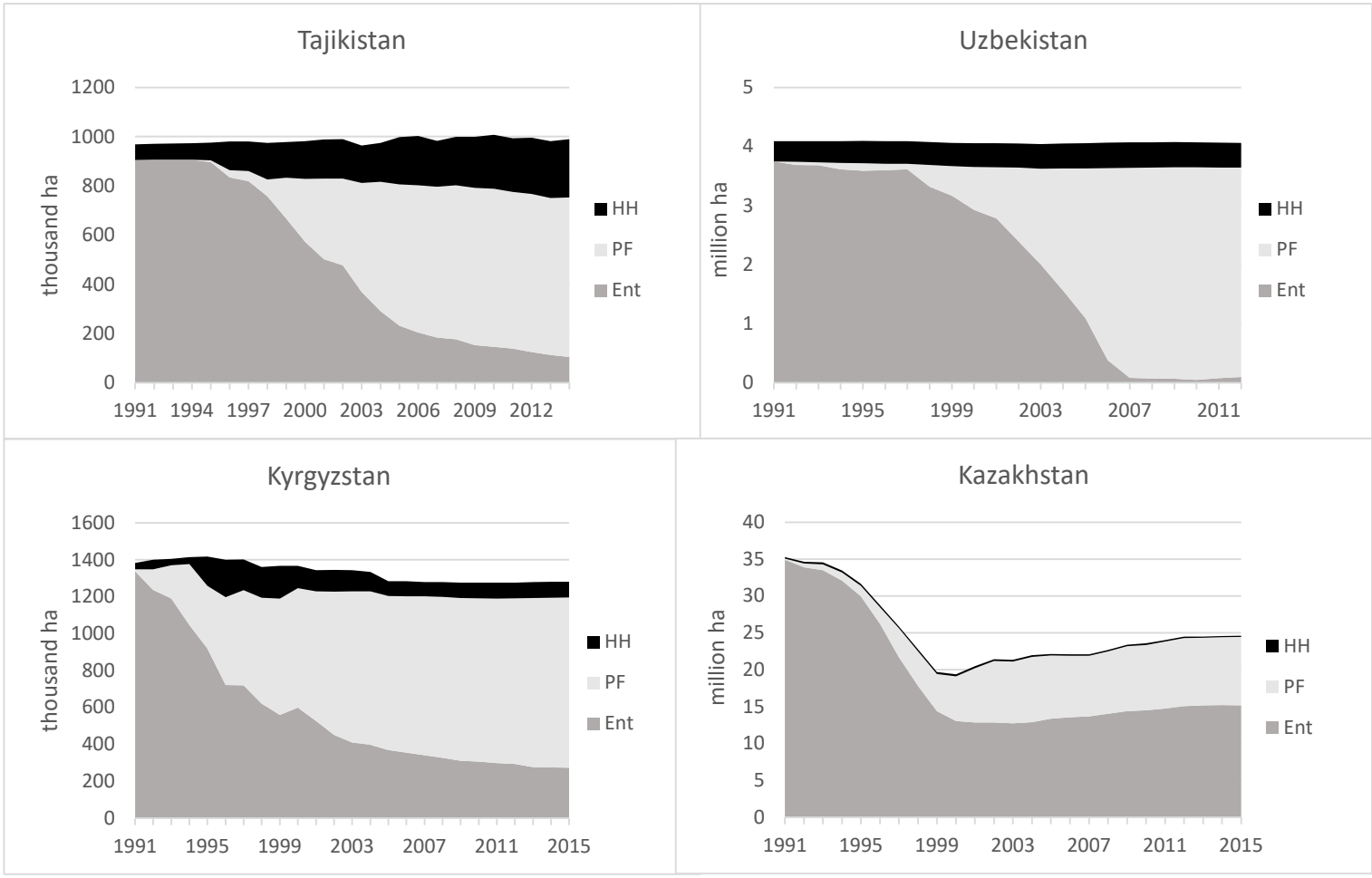


Figure 3. Shift of arable land from agricultural enterprises to individual farms since 1991 (countries with "conventional" individualization: Tajikistan, Uzbekistan, Kyrgyzstan, Kazakhstan). Legend: HH – household plots, PF – peasant farms, Ent – agricultural enterprises. Source: official country statistics.

Alongside with conventional individualization of land tenure in the four countries, Turkmenistan also achieved remarkable changes of farm structure despite its image as a "slow" reformer. In fact, Turkmenistan allowed farm structure to shift in 1998 from collective form of organization to family leaseholding. Leaseholding is basically a form of individual farming (with many restrictions on leaseholders' freedom to farm), although land in family leasehold is still recorded as part of the inventory of the former collective farm, which actually awards the leaseholds to its members: this land is not counted as individual tenure in official statistics and is not reflected as an advance in land reform in the formal land reform indexes published by international organizations. Turkmenistan is the only country in the region where individual agriculture is mainly leasehold-based and the bulk of land in individual land tenure is not reported in official statistics. In **Figure 4** the left-hand panel reflects the official land statistics, which show very little individualization since 1990. The right-hand panel uses indirect land-use data to separate out the component of arable land cultivated in family leaseholds: with this adjustment most of the arable land is seen to be in individual use since 1998.

Tur – official **Tur – de facto**

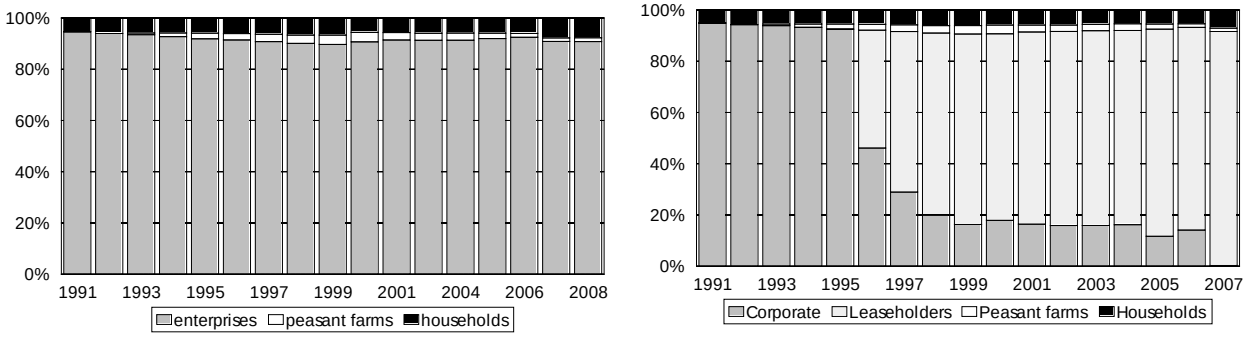


Figure 4. Individualization through leaseholding in Turkmenistan. Left panel: farm structure based on official statistics; right panel: de facto land use structure. Source: Turkmsnitan general and agricultural statistical yearbooks (various years).

The shift of the main productive resource—arable land—from enterprises to the individual sector has resulted in a significant increase in the share of individual farms in agricultural production. At the end of the Soviet era individual farms (the traditional household plots at that time) contributed one-third of Gross Agricultural Output (GAO) in Central Asia and agricultural enterprises produced the remaining two-thirds; in 2010, individual farms (household plots and peasant farms combined) contributed 89% of GAO and the share of the enterprises had shrunk to 11%. **Table 1** summarizes the data on the dramatic shift of land and production to the individual sector between 1990 and 2010 in the Central Asian states. For comparison it shows Azerbaijan as a representative of the Trans-Caucasus region, where individualization has been comparable to that in Central Asia, and also Russia and Ukraine, where individualization lags far behind both Central Asia and Trans-Caucasus.

Table 1. Changing role of individual farms 1991-2010

	Share of arable land in individual use, %		Share of GAO from individual farms, %	
	1991	2010	1991	2010
Kaz	1	39	32	71
Kyr	3	76	44	98
Taj	7	86	36	91
Tur*	5	93		
Uzb*	8	75	33	94
Average Central Asia	*5*	*73*	*33*	*89*
Azerbaijan	4	84	35	95
Russia	2	31	24	56
Ukraine	7	49	27	60

*Latest available data for 2006; includes leaseholding. Source: official country statistics.

There are certain differences in the composition of individual sector GAO across countries (**Figure 5**). Kyrgyzstan stands out as the country where peasant farms contribute the largest share of GAO. In Tajikistan, Uzbekistan, and Kazakhstan the role of the household plots in production is much more prominent. The share of agricultural enterprises in GAO has collapsed across the entire region, but in Kazakhstan they retain a relatively large share of production (although also much smaller than the share of the individual sector). The relatively large share of production contributed by corporate farms in Kazakhstan is consistent with their relatively large share in arable land (see **Figure 3**).

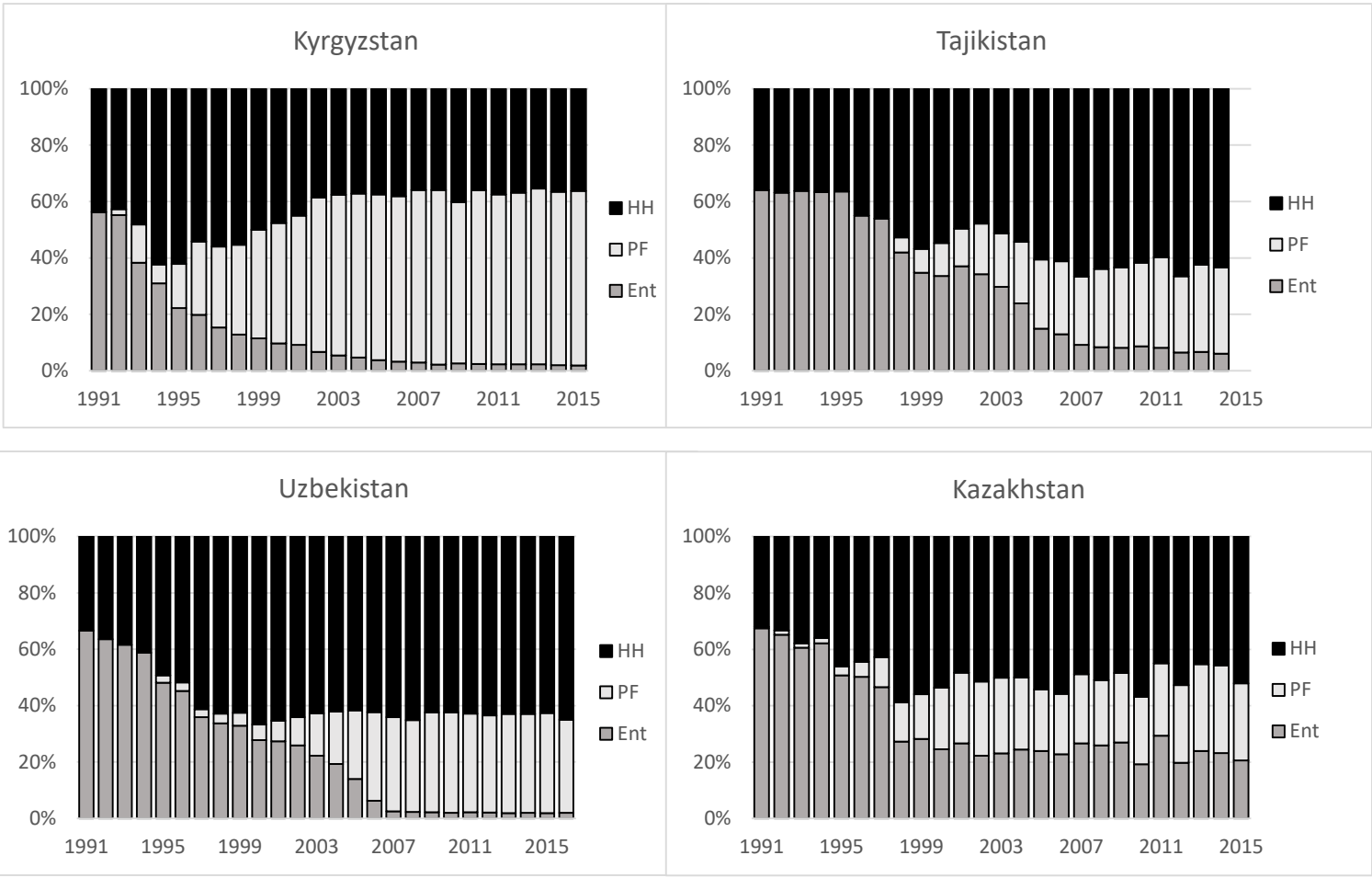


Figure 5. Changes in structure of GAO by farm type since 1991.
Legend: HH – households, PF – peasant farms, Ent – agricultural enterprises. Source: official country statistics.

The turnaround point and individualization

The turnaround in GAO in all Central Asian countries coincided with a significant jump of the share of arable land in individual cultivation (**Table 2**). This share increased abruptly by a factor of between 1.6 and 2.0 in just two years: the year before the turnaround point (t-1) and the year after the turnaround point (t+1).[2] These abrupt increases in the share of individual land tenure were triggered by identifiable pieces of legislation adopted near the turnaround point (**Table 3**).

Table 2. Change in the share of arable land in individual use before and after the GAO turnaround point

	Turnaround year, t	Arable land in individual use, %		
		Year t-1	Year t+1	Jump (t+1)/(t-1)
Kaz	1998	16	27	**1.69**
Kyr	1995	26	49	**1.88**
Taj	1998	16	32	**2.00**
Uzb	1996	12	19	**1.58**
Tur (incl. leaseholds)	1998	54	84	**1.56**

Source: official country statistics.

[2] In Azerbaijan the shift of arable land resources on two sides of the turnaround point (1997) was even more dramatic: the share of arable land in individual use went up from 6% in 1996 to 82% in 1998, a 14-fold increase.

Table 3. Significant land-reform legislation passed near the GAO turnaround point

	Turnaround year	Date of significant land reform legislation	Name of legislation
Kaz	1998	8.1997 3.1998	Land shares Peasant farms law
Taj	1998	6.1996 6.1998	Enterprise reorganization Right to land use
Tur	1998	12.1996 1.1997	Land allocation to individuals Improving farm incentives
Kyr	1995	2.1994 8.1994	Measures for deepening land and agrarian reform Procedures for implementation of land reform; reorganization of ag enterprises; land share determination
Uzb	1996	8.1994	Measures for economic encouragement of the development of agriculture

Source: Authors' compilation from official publications.

The significant change of individual land tenure at the turnaround point and the existence of identifiable legal acts associated with the turnaround year provide strong evidence of a link between individualization of agriculture and agricultural recovery. Further evidence is provided by the comparison of individualization in Central Asia, on the one hand, and Russia and Ukraine, on the other (**Table 1**). Two facts are apparent for Russia and Ukraine. First, agriculture in Russia and Ukraine is much less individualized than in Central Asia (**Table 1**). Second, agricultural recovery in Russia and Ukraine after the turnaround point in 1999 was much more sluggish than in Central Asia or Trans-Caucasus (**Figure 1**). In our view, the sluggish recovery in Russia and Ukraine is the result of indecisive and half-hearted individualization attempts: these two large countries continue to maintain policies that give preference to large corporate farms rather than small family farms. By contrast, the robust recovery in both Trans-Caucasus and Central Asia is associated with decisive land individualization policies in these regions.

Finally, a simple analysis for Central Asia and other CIS countries shows that the annual growth rate achieved after the turnaround year is positively associated with the share of arable land in individual farms (**Figure 6**; R^2=0.45, the regression coefficient is significant at 5%). In other words, post-turnaround growth is faster in countries that have more land in individual use. It is interesting to note that a similar result is obtained in a cross-sectional regression of some 80 administrative regions in Russia: here also agricultural growth is faster in regions with a higher share of land in individual tenure (household plots and peasant farms combined).

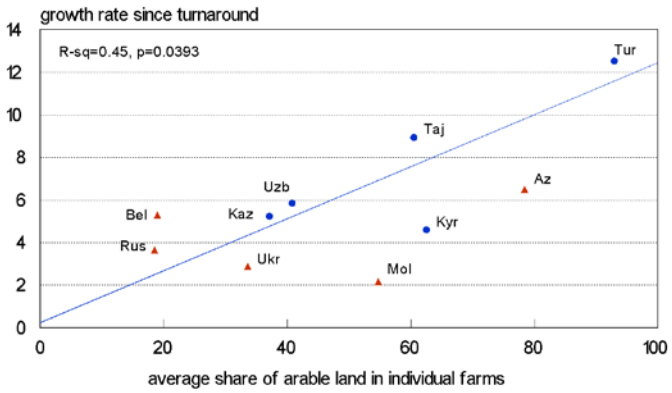


Figure 6. GAO growth rate since turnaround increases with the increase of the average share of arable land in individual farms: Central Asia and other CIS countries. Source: Authors' calculations based on country statistics.

Sources of growth

Another view of the contribution of individual farms to growth is provided by **Figures 7-8**, which show the growth of GAO in absolute values for Tajikistan, Kyrgyzstan, and Kazakhstan (no data for Uzbekistan and Turkmenistan). The data are presented in constant prices, decomposed by farm type. The total GAO produced by all farm types corresponds to the line that delimits the graph area from above. The bottom (black) layer represents the GAO produced by farm enterprises, and the layers above it represent the absolute contribution of the individual sector. In Tajikistan and Kyrgyzstan the contribution of farm enterprises to GAO shrinks markedly over time, while the total GAO continues growing. This clearly proves that agricultural growth is driven by the individual sector.

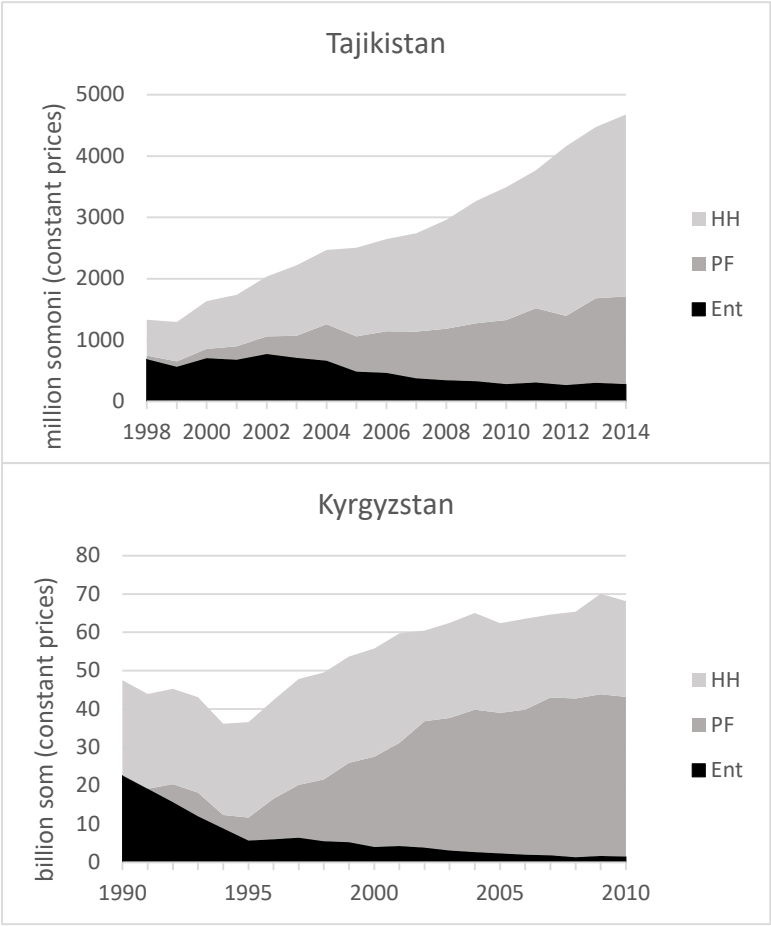


Figure 7. Individual sector as an engine of growth in Tajikistan and Kyrgyzstan: total GAO in constant prices (upper envelope curve) increases despite continued decrease in the enterprise sector (bottom black layer). Legend: HH – household plots; PF – peasant farms; Ent – agricultural enterprises. Source: official country statistics.

In Kazakhstan the overall growth since turnaround (in 1998) was more moderate than in the two other countries (**Figure 8**; see also **Figure 2**), but the contribution of farm enterprises was increasing (contrary to Tajikistan and Kyrgyzstan). Still, the total GAO (in 2000 agricultural prices) increased by about 400 billion tenge, rising from 400 billion tenge in 1998 to 800 billion tenge in 2011, while the farm enterprises contributed just 100 billion tenge to this growth, with their production rising from about 100 billion tenge to slightly over 200 billion tenge. Thus, also in Kazakhstan, the overall growth in GAO was driven primarily by the individual sector, whose absolute contribution doubled from 300 billion tenge in 1998 to 600 billion tenge in 2011, contributing 75% of the total growth over this period.

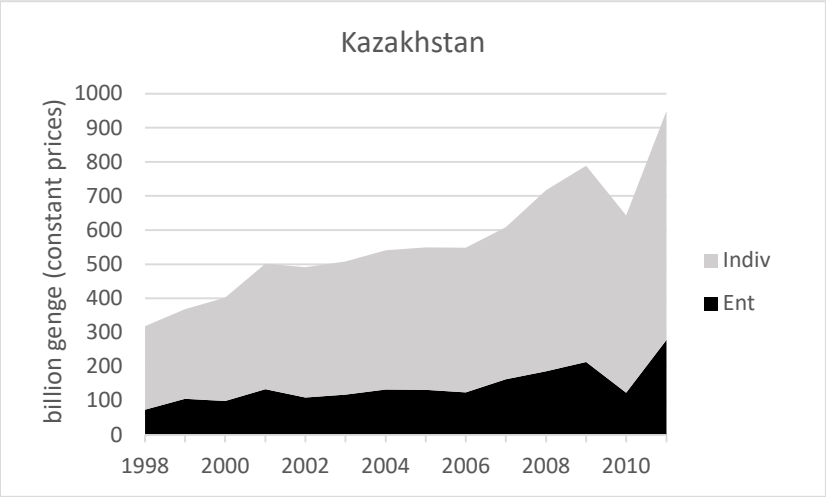


Figure 8. Individual sector as engine of growth in Kazakhstan: total GAO in constant prices (upper envelope curve) increases more than the increase in the enterprise sector (bottom black layer). GAO in constant prices estimated by using the index of agricultural prices to deflate reported GAO in current prices. Legend: Indiv – individual sector; Ent – agricultural enterprises. Source: official country statistics.

Productivity of individual farms

Central Asia enjoys robust agricultural growth despite the steady decline of corporate farms (enterprises) and their shrinking share of both land and production. This implies that recovery in agriculture is driven entirely by growth in the individual sector of household plots and peasant farms, while the formerly dominant sector of agricultural enterprises continues its decline. In fact, individual farms are the engine of recovery because they achieve higher productivity than enterprises. The renewal of growth in Central Asia is attributable to a combination of two factors: the increasing share of the individual sector (household plots and peasant farms) in agriculture and its higher productivity

A rough and easy way to assess the productivity of farms of different types is by comparing their share in production to their share in arable land. In Central Asia, the individual sector—household plots and peasant farms combined—contributes 88% of GAO (the value of gross agricultural output) on just 71% of arable land (see **Table 1**). This disparity between the share of individual farms in output and land is a persistent phenomenon that was observed also in the Soviet period, when household plots—the only type of family farm in existence at that time—produced 45% of GAO on just 2% of land. The disparity between shares of production and land provides a measure of relative productivity: the entire agricultural sector produces 100% of GAO on 100% of land with relative productivity of 1; relative productivities higher than 1 (when the share of output is greater than the share of land) are indicative of land being used more efficiently than the average for the entire sector, while relative productivities less than 1 (when the share of output is less than the share of land) suggest that land is being used less efficiently than the sectoral average.

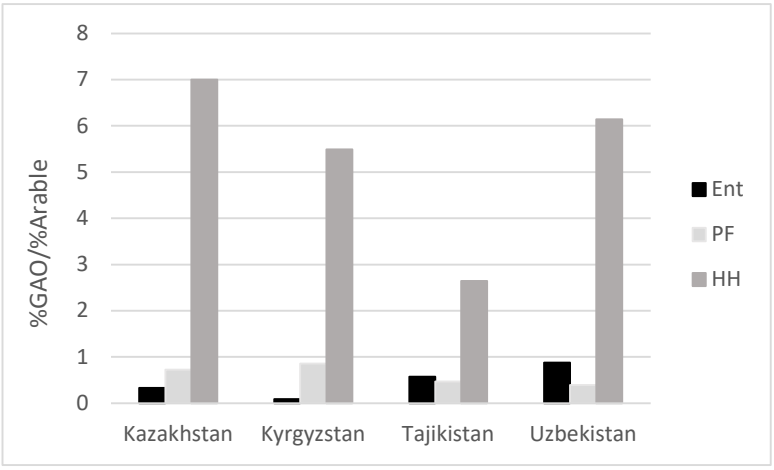


Figure 9. Relative productivity of land by farm type in Central Asia, 2015 data for Kaz, Kyr, Taj; 2012 for Uzb; compressed vertical scale for Kazakhstan (actual value HH=85).

Estimates of relative efficiency of land utilization for farms of the three main types—agricultural enterprises, peasant farms, and household plots—present a clear ranking for the Central Asian countries (**Figure 9**): the efficiency of land utilization rises sharply from enterprises (the lowest) to household plots (the highest). Peasant farms generally fall in the middle between enterprises and household plots (except in Tajikistan, where many so-called "peasant farms" are simply renamed enterprises). The low relative productivity of agricultural enterprises suggests that they are very inefficient in the utilization of the large land resources that they continue to control: more efficient farming could generate substantially greater output from the available arable land and thus contribute more to rural incomes and poverty alleviation.

Alongside relative productivities of land utilization, we can also calculate the absolute land productivity for different farm types as the value of crop production per hectare of sown land. Such calculations have been carried out for four countries: Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan. Calculations for Turkmenistan run into difficulties due to data problems stemming from the unclear definition of what constitutes the individual farm sector in this country.

The pattern for Kyrgyzstan and Kazakhstan is the closest to our theoretical expectations: in both countries individual farms—household plots and peasant farms—achieve consistently higher levels of land productivity than agricultural enterprises (**Figure 10**). Among the two components of the individual sector, the traditional small household plots outperform the newly emergent peasant farms. The time series of productivity calculations in absolute values reveal the same ranking for Kyrgyzstan and Kazakhstan as relative productivity (see **Figure 9**): efficiency of land use rises from enterprises to peasant farms and finally to household plots. This efficiency ranking provides strong evidence in support of land reform, which has been responsible for the strengthening of the relatively more productive individual farms.

The diagrams for Tajikistan and Uzbekistan (**Figure 11**) also demonstrate the case for land reform and its potential yield improving effects. **Figure 11** shows the huge differences in productivity of land between household plots on one side and enterprises and peasant farms on the other. Household plots—the undisputed individual farms in all CIS countries— consistently achieve much higher levels of land productivity: agricultural land in household plots is utilized 20 to 50 times more productively than in farms of other types. Further redistribution of land to

household plots could substantially increase average productivity in agriculture, thus leading to a large increase in agricultural production. The productivity results for peasant farms are puzzling in our theoretical framework: there are no statistically significant performance advantages to family-run peasant farms compared with manager-run enterprises in Tajikistan and Uzbekistan.

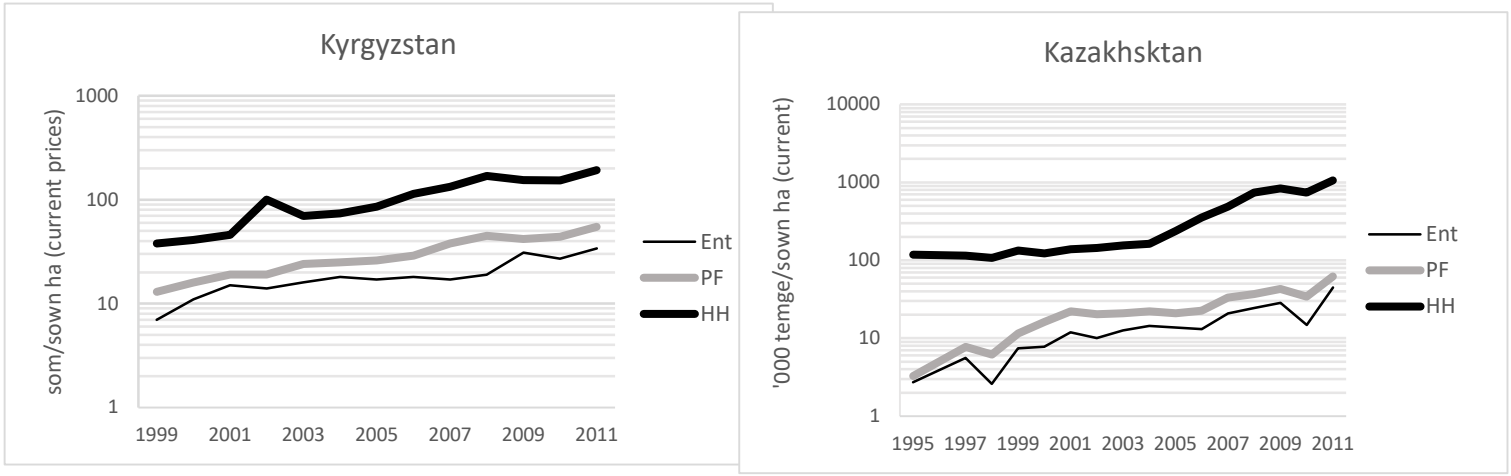


Figure 10. Land productivity by farm type in Kyrgyzstan (1999-2011) and Kazakhstan (1990-2009). Based on value of crop production in current prices.

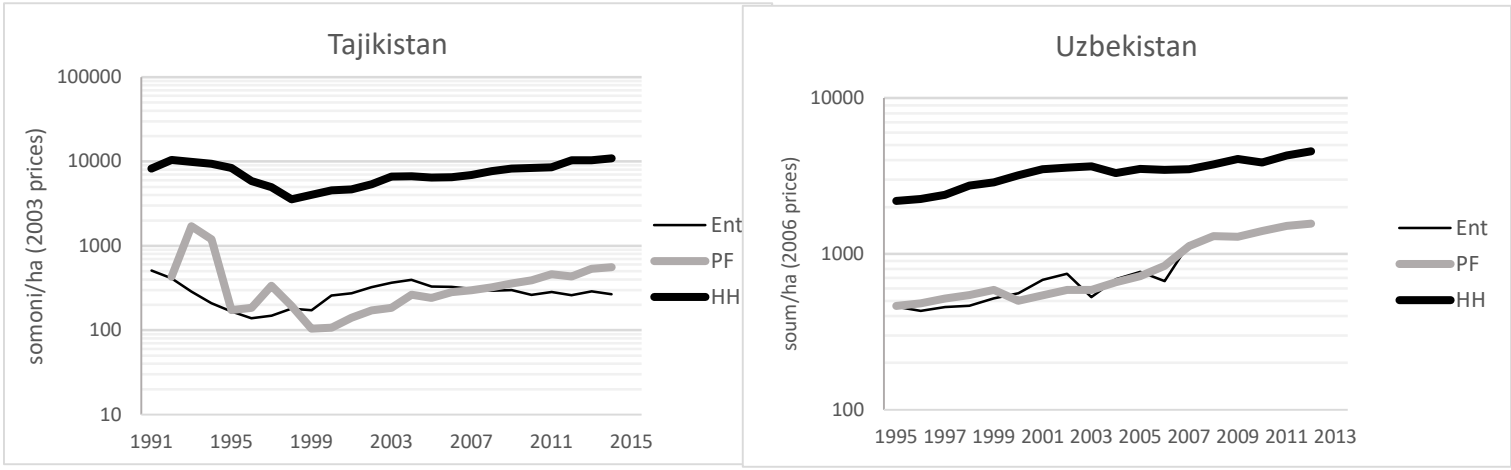


Figure 11. Land productivity by farm type in Tajikistan (1991-2014) and Uzbekistan (1995-2012). Based on value of crop production in constant prices.

In Tajikistan, this puzzling result may stem from the fact that until recently at least one-third of the peasant farms in this country were not really individual farms at all: they were collective dehkan farms (partnerships) created in the process of reorganization of traditional farm enterprises and their incentives were closer to those of corporate farms than individual farms. Many of these collective dehkan farms had been only cosmetically reorganized and the management structures remained unchanged. Under these circumstances we should not be surprised that the productivity of peasant farms in Tajikistan, taken as a heterogeneous group, was not different from that of the farm enterprises they had succeeded. More recently, the World Bank's Land Registration and Cadastral System Project (LRCSP), jointly with the government of Tajikistan, initiated a program reallocating land from collective dehkan farms to family and individual farms. As a result, the number of collective dehkan farms shrank rapidly and most dehkan farms today are individual and family farms. This may have actually

been one of the reasons for the increase in land productivity of peasant farms, which since 2007 has surpassed the productivity of collective enterprises (**Figure 11**, left panel).

Another reason may be related to government policies, which often impose constraints on farmers' freedom of operating choices. This is particularly so in Tajikistan and Uzbekistan (as well as Turkmenistan), where governments continued to maintain the traditional system of state orders for many years after the dissolution of the Soviet Union. Under this system, peasant farmers were obligated to sow fixed proportions of their land in cotton and wheat and sell their output at prices fixed by the state. Household plots, on the other hand, were never subject to state orders. The lack of "freedom to farm" may have depressed the productivity of peasant farms, and recent relaxation of these constraints in Tajikistan may have contributed to the increase in their productivity since 2007.[3]

From a slightly different perspective we can conjecture that the newly emergent peasant farms are still in the learning stage, trying to adapt to the market environment and to optimize their operations. The infrastructure and support services in all CIS countries are grossly inadequate in general and are ill-adapted to serving mid-sized family farms in particular. Inadequate marketing and supply channels, as well as almost total lack of extension and advice services, constitute a serious obstacle to efficient operation of new peasant farms and prevent them from realizing the inherent advantages of their individual form of organization. It is conjectured that the performance of peasant farms will rise in line with theoretical expectations when the market and policy environment improves.

Conclusion

The five countries of former Soviet Central Asian – Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan – have made huge strides in their efforts to reform tenure rights in agricultural land and change the traditional Soviet-style farming structure to a model closer to market principles. Two of the five countries – Kazakhstan and Kyrgyzstan – now recognize private ownership of agricultural land and allow land market transactions; Tajikistan retains state ownership of land but nevertheless allows land market transactions in the guise of transferable land use rights; only Uzbekistan and Turkmenistan retain the Soviet model of state-controlled rigidly non-transferable land, but even in these two countries land use and agricultural production have massively shifted from large collective farms to small leaseholders. The individualization of Central Asian agriculture has largely driven the impressive recovery in agricultural production that we are witnessing since about 1998 across the region.

The empirical evidence presented in this study supports the theoretical view that the differences in the incentive structure between corporate and family farms should lead to higher productivity in family farms (i.e., peasant farms and household plots in the present context) than in corporate farms (large-scale enterprises). The productivity difference is due, in particular, to the positive effects of personal accountability and absence of agency costs in

[3] The importance of "freedom to farm" policies is also highlighted by farm survey data from Turkmenistan, where the productivity of family leaseholds is substantially lower than the productivity achieved by the same families on their household plots (Lerman and Stanchin, 2004). Leaseholds, like peasant farms, are strictly bound by state orders and there is not much room for true private initiative in their production and marketing decisions, whereas household plots are not subject to these restrictions and they flourish thanks to private initiative.

family farms. These theoretical considerations provide the rationale for land reform and farm restructuring in transition countries, which generally leads to individualization of agriculture, i.e., a shift from predominance of Soviet-style corporate farms to family farms.

Recovery of agricultural growth is associated with individualization of farming. Because of the higher productivity of family farms, and especially household plots, the individualization of agriculture has led to significant recovery of agricultural production in Central Asia. The steep decline in GAO that characterized the early years of transition (1990-1994) changed to robust growth in the second half of the 1990s. Following the shift to more productive individual agriculture GAO had recovered to the 1990 Soviet-era peak by 2004-2005 and has continued growing.

Small family farms have become the backbone of the post-transition farming structure, replacing the agricultural enterprises that dominated during the Soviet era. Yet policy makers in all CIS countries, including Central Asia, continue to show very strong bias in favor of large farms, ignoring the empirical fact that there are generally no economies of scale in primary agricultural production and disregarding the evidence in their own countries that GAO growth is driven by individual farms. Investments and support measures are primarily designed for large corporate farms, although this sector makes a small and steadily decreasing contribution to agricultural output. The small family farms, on the other hand, are treated with disdain as "non-commercial" and "subsistence oriented", completely disregarding their dominant contribution to agricultural production. This attitude is clearly evident in the latest "farm size optimization" campaign in Uzbekistan, which involves forced enlargement of some peasant farms at the expense of other farms, whose owners are forced out of agriculture. The campaign characterized as it is by blatant government intervention clearly contradicts the basic principles of freedom of choice in agriculture and can only be described as re-collectivization.

Direct evidence highlighting the benefits of "freedom to farm" policies emerges from a body of farm surveys conducted in Turkmenistan and Uzbekistan. Survey data, as opposed to official country statistics, are designed to explore the micro achievements of farmers, leaseholders, and rural families in general. The surveys show that that the productivity of leaseholds is substantially lower than the productivity achieved by the same families on their household plots (Lerman and Stanchin 2004). The only possible explanation, in our view, lies in the different incentives attributable to the sharp differences in the institutional production and marketing arrangements between the household plots and the leasehold sector. Leaseholders (like peasant farmers) are strictly bound by state orders, and there is not much room for true private initiative in their production and marketing decisions. The household plots, as noted above, are not subject to these restrictions and they are flourishing thanks to private initiative. To enable the rural population to reap the full benefits of individualization, agricultural policies should ensure freedom of production and marketing decisions at the farm level and thus create incentives for maximizing private initiative.

The policy implications of these findings are clear. Instead of meddling in farmers' choices, governments should concentrate on implementing policies that enable small farms to operate profitably and efficiently. The new farming structure that has emerged during the transition requires a new market infrastructure for farm services, including channels for sale of products and delivery of farm inputs, as well as provision of extension, training, and advice services for the small private farmers. Government policies should be designed to take these new factors into consideration.

While much remains to be done in the area of land reform and farm restructuring until Central Asia closes the gap between the administrative-command tradition and market agriculture, the focus of attention has begun to shift to post-restructuring measures intended to ensure viability and profitability of the smallholder farms by counteracting the negative effects of smallness. This is reflected, in particular, in the emerging recognition of the need for agricultural service cooperatives as an institution to support market access for smallholders. The development of agricultural service cooperatives is now an official priority in the latest agricultural strategies of both Kyrgyzstan and Tajikistan.

The empirical results of this study have important implications for the ongoing policy debate between the supporters of large corporate farms, who continue to advocate economies of scale, and the supporters of smaller family farms, who emphasize the advantages of individual incentives. This debate is not limited to Central Asia, and it is relevant also for the rest of the CIS. The present article will hopefully inform this ongoing debate and incrementally add to the growing body of evidence that highlights the performance advantages of family farms in transition countries.

Acknowledgment

This article summarizes the body of work begun by the first author back in 1998 with World Bank agricultural sector missions to Uzbekistan and Turkmenistan (1994-1995). The findings of these early missions were published in two chapters in a volume edited by Stephen Wegren (1998) and Zvi Lerman has since continued the work on land reform Central Asia. Collaboration with David Sedik on Central Asia began in 2005, when he was Policy Officer at the FAO Regional Office for Europe and Central Asia in Budapest.

References

Ahearn, M., Yee, J., Huffman, W. (2002). “The effect of contracting and consolidation on farm productivity,” paper presented at the Economics of Contracting in Agriculture Workshop, Annapolis, MD (July).

Allen, D.W. and Lueck, D. (2002). *The Nature of the Farm: Contracts, Risk, and Organization in Agriculture*, Cambridge, MA, MIT Press.

Blarel, B., Hazell, P., Place, F., and Quiggin, J. (1992), “The economics of farm fragmentation: Evidence from Ghana and Rwanda,” *The World Bank Economic Review*, 6(1): 233-254.

CISSTAT (2014). *Official Statistics of the Countries of the Commonwealth of Independent States*, CD-ROM 2014-19, Moscow: Interstate Statistical Committee of the CIS, 2014.

Csaki, Csaba, Zvi Lerman, and Sergey Sotnikov (2000). *Farm Sector Restructuring in Belarus: Progress and Constraints,* World Bank Technical Paper No. 475, Washington, DC: The World Bank.

Lerman, Zvi. 2005. “Farm Fragmentation and Productivity: Evidence from Georgia,” Discussion Paper 8.05, Rehovot: Center for Agricultural Economic Research,

Lerman, Zvi. 2006. “The Impact of Land Reform on Rural Household Incomes in Transcaucasia,” *Eurasian Geography and Economics* 47(1): 112-123.

Lerman, Zvi, Csaba Csaki, and Gershon Feder. 2004. *Agriculture in Transition: Land Policies and Evolving Farm Structures in Post-Soviet Countries*. Lanham, MD: Lexington Books.

Lerman, Zvi and Dragos Cimpoies .2006. “Land Consolidation as a Factor for Rural Development in Moldova,” *Europe-Asia Studies*, 58(3): 439-455.
Lerman, Zvi, and David Sedik. 2010. *Rural Transition in Azerbaijan*. Lanham, MD: Lexington Books.
Lerman, Zvi, David Sedik, Nikolay Pugachov, and Aleksandr Goncharuk. 2007. *Rethinking Agricultural Reform in Ukraine*, Studies on the Agricultural and Food Sector in Central and Eastern Europe, v. 38. Halle: IAMO.
Lerman Z, Sedik D (2013) Russian agriculture in transition. In: Alexeev M, Weber S (eds) *Handbook of Russian economy*, New York: Oxford University Press.
Lerman, Z. and I. Stanchin (2004), “Institutional Changes in Turkmenistan’s Agriculture: Impacts on Productivity and Rural Incomes,” *Eurasian Geography and Economics*, Vol. 45, No. 1, pp. 60-72.
Lerman, Zvi, and William Sutton. 2008. “Productivity and Efficiency of Small and Large Farms in Moldova,” *Post-Soviet Affairs* 24(2): 1-24.
Waedekin, Karl-Eugen (1973). *The Private Farm in Soviet Agriculture*, Berkeley: University of California Press.
Wegren, Stephen, ed. (1998). *Land Reform in the Former Soviet Union and Eastern Europe*, New York: Routledge, Chs. 6 (Uzbekistan) and 7 (Turkmenistan).