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# Success and Failure of Reform: Insights from the Transition of Agriculture

SCOTT ROZELLE *and* JOHAN F. M. SWINNEN<sup>1</sup>

## 1. Introduction

More than twenty years ago, China embarked on its economic reform path by introducing the household responsibility system (HRS) in agriculture. A few years later, Vietnam followed. Both countries reduced price distortions and reallocated key land rights from collective farms to rural households. The impact was dramatic. Productivity and incomes in both countries soared (Justin Lin 1992; John McMillan, John Whalley, and Lijing Zhu 1989; Prabhu Pingali and Vo-Tong Xuan 1992). The reforms lifted hundreds of millions of rural households out of dire poverty (World Bank 2001). Economists praise the Chinese reforms as

the “biggest antipoverty program the world has ever seen” (McMillan 2002, p. 94) and have claimed that the reform policies have led to “the greatest increase in economic well-being within a fifteen-year period in all of history” (Stanley Fischer 1994, p. 131).

As a consequence, expectations were high ten years later as leaders in many nations of Central and Eastern Europe (CEE) and the former Soviet Union (FSU) began to dismantle socialism and liberalize their agricultural economies. Reformers implemented a bold series of policies, increasing incentives and modifying the institutions within which rural residents lived and worked. The reforms, however, disappointed many nations. Farm output fell and rural poverty increased (Karen Brooks and John Nash 2002).

The sharp differences among nations in the early impacts of agricultural reform and transition in the rest of the economy triggered an intense debate on the sources of growth (Mathias Dewatripont and Gérard Roland 1992, 1995; Kevin Murphy, Andrei Shleifer, and Robert Vishney 1992; John McMillan and Barry Naughton 1992; Jeffrey Sachs and Wing Thyee Woo 1994; Roland 2000). Some researchers, especially those studying East Asia, credit the gradual sequencing of reforms that initially focused mainly on reforming property rights and delayed any major

<sup>1</sup> Rozelle: University of California, Davis. Swinnen: Katholieke Universiteit Leuven and the World Bank. The insights in this paper are based on more than a decade of research and collaborations with many coauthors throughout the world. The authors thank coauthors and colleagues whose comments and discussions have contributed to the insights presented in this paper. In particular we would like to thank Jikun Huang and Karen Macours for discussions and collaborations on related projects. Liesbeth Dries provided invaluable assistance in the data analysis. The paper benefited from extensive and very useful comments from the editor and two reviewers; and from comments by seminar participants at Stanford University and University of Michigan. The views expressed in this paper do not necessarily reflect those of the institutions the authors are affiliated with. The authors are solely responsible for the opinions expressed in this paper.

changes to the marketing system (Dwight Perkins 1988). For example, Lin (1992), McMillan et al. (1989), and Pingali and Xuan (1992) attribute most of the success of the agricultural reforms in China and Vietnam to the rise in incentives provided by decollectivization. The case of China demonstrated that transition in agriculture could succeed, at least in the early years, without the disruption caused by the dismantling of government-run marketing channels and in the absence of well-functioning markets (McMillan and Naughton 1992; Alan deBrauw, Jikun Huang, and Scott Rozelle 2000, forthcoming).

In reaction to the claims about East Asia, skeptics responded that rural development in China and Vietnam occurred primarily as a result of low initial levels of development (Sachs and Woo 1994). Post-reform growth was nothing more than the rise in economic activity that was experienced elsewhere in East Asia during the post World War II era. Others have been even more antithetical. Leszek Balcerowicz (1994, p. 34) writes that the use of the “Chinese Way” as an argument in favor of gradual reforms in CEE and the Commonwealth of Independent States (CIS) is “a patent misuse of the facts.” Gordon Hughes (1994, pp. 135–36) states that “China’s path is in no way relevant to the structural problems faced in Eastern Europe and the FSU” and should be “no guide to what can or should happen.”

As the reforms in CEE and the CIS have unfolded, differences in economic performance among transition nations outside East Asia complicate the puzzle. As we show in this paper, although agricultural output fell uniformly across Europe in the wake of the reforms, based on other measures, within a short period of time the farming sectors in Hungary, the Czech Republic, Slovakia, and other nations responded positively. Output per unit of labor rose sharply. Total factor productivity (TFP) in agriculture grew as strongly in CEE within a few years after the fall of the Berlin Wall as it did at a similar point in the reform process of China and

Vietnam (Songqing Jin et al. 2002; Dwayne Benjamin and Loren Brandt 2001; Karen Macours and Johan Swinnen 2000a).

Agriculture, however, did not fare as well in most CIS countries. Although many policies—especially price adjustments and subsidy removals—were common across CEE and CIS nations, others, such as farm restructuring and the liberalization of marketing institutions, proceeded more gradually in most CIS nations. A careful examination of the subsequent outcomes suggests that the nature of reform matters. While the magnitude of the collapse *in terms of output* was no worse in the CIS nations than in CEE, when measured *in terms of productivity*, the go-slow strategy in the CIS faltered. Productivity in Russia, Ukraine, and Kazakhstan not only fell sharply during the immediate post-reform period, it continued falling or remained stagnant during most of the first decade of transition. Examined through the lens of productivity, the patterns of performance are more similar between East Asia and CEE than they are between CEE and the CIS.

Given these intriguing combinations of policies and performance, we believe a renewed inquiry into the debate about the impact of reform on economic performance is due. The commonalities and differences of the nature of reform among East Asian, CEE, and CIS nations and the subsequent productivity contours call for a careful comparative analysis. To do so, we turn to the literature and build an empirical picture of the policies and institutional shifts that triggered agricultural growth in some of the world’s 28 transition nations and led to stagnation in others. The lessons learned from the process of transition in the agrarian development of most of the formerly socialist countries can inform policy makers and scholars about the choice of reform strategy and the relationship between reform and economic growth.

Focusing on agriculture to analyze which policies contribute to success and failure of economic reform has several benefits. The sharpness of the policy changes in agriculture

and the fundamental differences among countries provide as clean a test as we can get. The relative simplicity of agricultural relationships—a farm is an easier production entity to analyze than an industrial firm—also adds clarity to the analysis. Hence, far from being a limitation of the study, our analysis of the reforms of price policy, property rights, and market liberalization in agriculture will yield important general lessons for those interested in the more fundamental relationships between reform, institutional change, and growth.

A study centering on agriculture also is inherently interesting, especially to those studying economic development. For example, in most East and Central Asian nations, agriculture dominated the economy during transition, and the changes in the sector have had an important impact on overall economic performance (Perkins 1994; Anita Chan, Ben Kerkvliet, and Jonathon Unger 1999; David Green and Richard Vokes 1998). When more than 50 percent of a nation's labor force is employed in agriculture, and when the major share of consumer income is spent on food, successful agricultural reform can have a major impact on poverty reduction and the welfare of the population. In fact, in studying the link between policy and performance, we believe that there are lessons for those studying economic performance outside the transition world.

To meet this goal, we pursue three specific objectives. First, we systematically document the post-reform trends in the agricultural performance in all transition countries of Asia and Europe.<sup>2</sup> Second, we discuss three key reforms—price and subsidy changes, property rights reform, and market liberalization—and review the evidence linking them to the observed rises and falls in output and productivity. Finally, in the last section, we review our general findings and draw a series of lessons.

While the transition literature is rich, and we document, analyze, and discuss many issues, we believe studying agriculture reform and performance leads to three new sets of insights. First, unlike the view of skeptics who find little in common among reform experiences across the transition world, the literature and data from East Asia, Central Europe, and the CIS nations provide a consistent picture linking reforms in agriculture to the performance of the sector. For example, the miraculous growth of output in East Asia and the crash in output in CEE and the CIS can almost fully be explained by the shifts in the relative terms of trade. Second, while the performances during the initial reform years differ dramatically in terms of output contours between East Asia and CEE, when measured in terms of productivity, the paths are remarkably similar. Property rights reform—decollectivization in East Asia, and land restitution and farm restructuring in some CEE nations—gave strong income and control rights to producers, which in turn resulted in strong productivity growth. The emergence of institutions of exchange also played an important role in explaining East Asia and CEE productivity growth. Finally, our analysis demonstrates that the real outliers in the reform process are the CIS nations. The absence of markets and poor property rights exacerbated the deteriorating performance caused by falling output-to-input price ratios, and mired many CIS countries in a decade of productivity stagnation.

Based on these insights, several general lessons emerge. When measuring success, it is important to carefully compare the performance of transition nations on the basis of productivity, not output. Conclusions of success change fundamentally when comparisons are based on productivity. In addition, while we find that initial conditions and the sequencing of policies do make a difference in making reform policies successful, our analysis suggests that, above all, success requires two key elements: good rights and an institutional environment within which agents can exchange goods and services and

<sup>2</sup> A list of the 28 transition countries that we examine (some in more depth than others) by their geographical categorizations is in the appendix.

access inputs. Despite the need for rights and markets or market substitutes, however, we also find that there clearly is much room for experimentation and heterogeneity. In the final analysis, on the basis of our study of the first decade of agricultural transition, we find that growth and rising efficiency occurred in almost all nations in which reformers created property rights and improved the marketing environment.

## 2. Success and Failure in Raising Production and Productivity During Transition

Before trying to reconstruct the record of the agricultural sectors in transition economies, we must agree on what constitutes success. As noted by early development economists, agriculture performs several important tasks for a developing nation—especially in the early stages of development (Bruce Johnston 1970). Agriculture is a source of plentiful and inexpensive food. It also provides labor for the industrial and service sectors of developing nations. In addition, agriculture supplies non-food commodities (e.g., fiber products, coffee and cacao, and tobacco) for domestic consumers and traders. Finally, the sector also creates linkages with other domestic industries and generates consumer demand.

Within the context of such a conceptual framework, it is easy to see why so many nations—especially those that are fairly poor—attach great importance to the production of agricultural output. Higher food production increases the supply in domestic food markets. Increased output also often provides higher incomes. For these and other reasons, many nations assess the success of their agricultural economy largely on the basis of output growth.

In some cases, however, output may not be an ideal measure. Specifically, using rising output as a metric of success could be deceiving for transition nations, since prior to reform most economies were characterized

by high levels of distortion.<sup>3</sup> In fact, it is possible that if the prices at the beginning of transition were distorted enough, output would fall or rise sharply merely in response to policies that allow prices to shift back to those that better reflect the long-run scarcity value of the resources. Following this logic, if a country had heavily subsidized input and output prices prior to reform, successful price reform should reduce domestic production.

In contrast, in all countries (both those in which rising output is a sign of success and those in which it is not), rising productivity is necessary for a successful agricultural sector. In assessing ways that agriculture can play a positive role in an economy, rising productivity can help policy makers meet many of their economic goals. Rising productivity through policies that provide better incentives and reduce resource waste (as a result of both better incentives and more complete control rights) will a.) lead to rising food and non-food agricultural production; b.) contribute to higher income; and c.) make the sector more modern. Getting more output out of fewer inputs can leave scarce resources free to either expand output or allow resources to shift to higher productive activities.

Because of the above arguments, in the rest of the paper we track both output and productivity. Productivity, however, will be our primary metric of success. We recognize that it is not complete and does not capture all dimensions of the short- and long-run effects of reforms on those inside the sector or on the sector's ultimate impact on the economy as a whole. Rise in productivity of the sector, however, does have many benefits and is an important indicator of the sector's health.

### 2.1 The Record of Agriculture in Transition Economies

Remarkable differences can be observed when examining the performance of

<sup>3</sup> Many transition economies also have a relatively small share of the population in the agricultural sector, so rising output will not lead directly to higher incomes for much of the population.

TABLE 1  
GROWTH OF GROSS AGRICULTURAL OUTPUT (GAO) IN TRANSITION COUNTRIES  
(INDEX EQUALS 100 IN FIRST YEAR OF REFORM)

	Years after start of reform with lowest GAO	GAO index in year of lowest GAO	GAO index after 5 years of reform	GAO index after 10 years of reform
East Asia				
China	0	100	132	166
Vietnam	0	100	128	152
Laos	2	90	109	127
Myanmar	0	100	127	155
Central Asia				
Mongolia	4	81	84	86
Kazakhstan	8	4	53	52
Kyrgyzstan	5	79	79	110
Tajikistan	9	48	61	53
Turkmenistan	6	69	106	99
Uzbekistan	6	90	98	97
Transcaucasus				
Armenia	3	69	82	8
Azerbaijan	5	55	55	72
Georgia	10	51	62	51
European CIS				
Belarus	9	57	61	58
Moldova	9	42	66	46
Russia	8	58	64	62
Ukraine	9	51	69	55
Baltics				
Estonia	8	41	55	42
Latvia	9	37	50	38
Lithuania	9	64	69	65
Central Europe				
Czech Repub.	5	75	75	77
Hungary	6	69	70	73
Poland	5	77	77	85
Slovakia	10	68	77	68
Balkans				
Albania	2	77	100	113
Bulgaria	7	57	63	62
Romania	3	75	93	93
Slovenia	3	65	81	79

Source: FAO

agriculture in transition countries during the first decade of reform. From the start of the reforms, output increases rapidly in East Asian transition countries (table 1, rows 1–5). In China output increases by 60 percent; in Vietnam output also rises sharply, increasing by nearly 40 percent (figure 1).

Outside of East Asia agricultural output trends follow a different set of contours (figure 1). Production falls steeply in the first years of transition in almost all CEE and CIS countries. Importantly, however, the length of time between the beginning of reform and the bottom of the trend line varies among nations

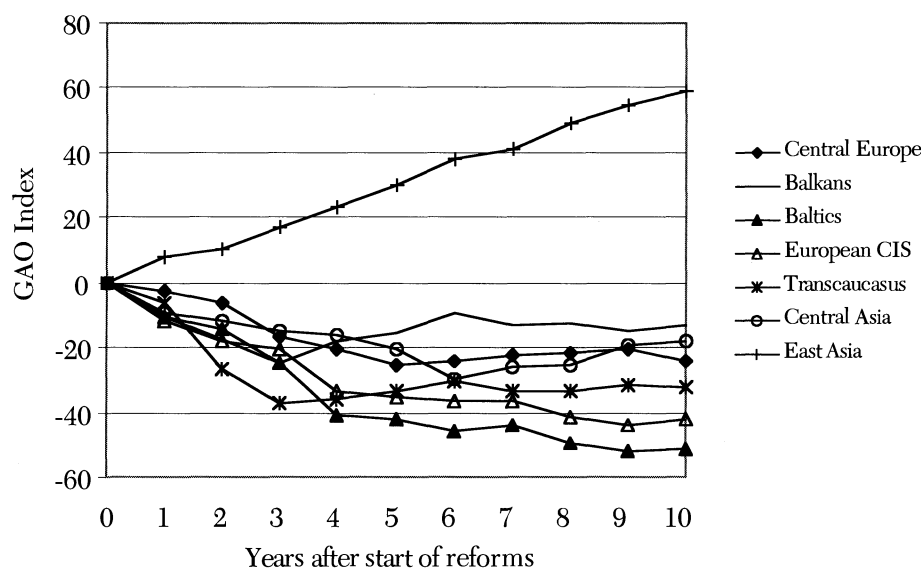


Figure 1. Changes in Gross Agricultural Output (GAO) Index during First 10 Years of Reform in Transition Countries. European CIS excludes Moldova; East Asia includes China and Vietnam only. Data source: see Table 1.

(table 1, column 1). For example, the decline in agricultural output stops soonest in Balkan countries such as Albania, Romania, and Slovenia (after two to three years). In most Central European countries, such as Poland, Hungary, and the Czech Republic, and in some Central Asian countries, such as Kyrgyzstan, Turkmenistan, and Uzbekistan, the decline lasts somewhat longer (five to six years). Finally, in a group of other countries, including the Baltic nations and several of the CIS nations, such as Russia, Belarus, Ukraine, and Kazakhstan, output declines for most of the decade after reform, falling to around 50 percent of pre-reform output.

Productivity trends tell a somewhat different story of how transition affects agricultural performance. While productivity trends evolve similarly to output in certain countries, strongly diverging patterns emerge in others. To get a comprehensive picture of productivity developments and to accommodate important data constraints, we analyze three sets of productivity indicators: labor productivity (output per unit of labor use), yields (output per unit of land), and total factor

productivity (TFP). While the most comprehensive indicator of productivity is TFP, comparative and reliable estimates of TFP are scarce because of data and methodological problems. For some transition countries, TFP measures and the data needed to calculate TFP measures are simply not available. For those countries in which TFP series are available, in some cases, comparisons have to be done carefully because of differences in methodologies, time frames, sampling, and commodity coverage. In contrast, information for partial productivity measures is more readily available, and so we start by examining indicators of partial productivity and complement the analysis with a review of estimates of TFPs from the literature.

For the entire reform period, trends in agricultural labor productivity (ALP), measured as output per farm worker, parallel those of output for some countries, but differ for others (figure 2). Like output, ALP of farm households in China and Vietnam rises steadily, albeit much stronger in China than Vietnam (table 2). In both countries, labor productivity increases especially several years

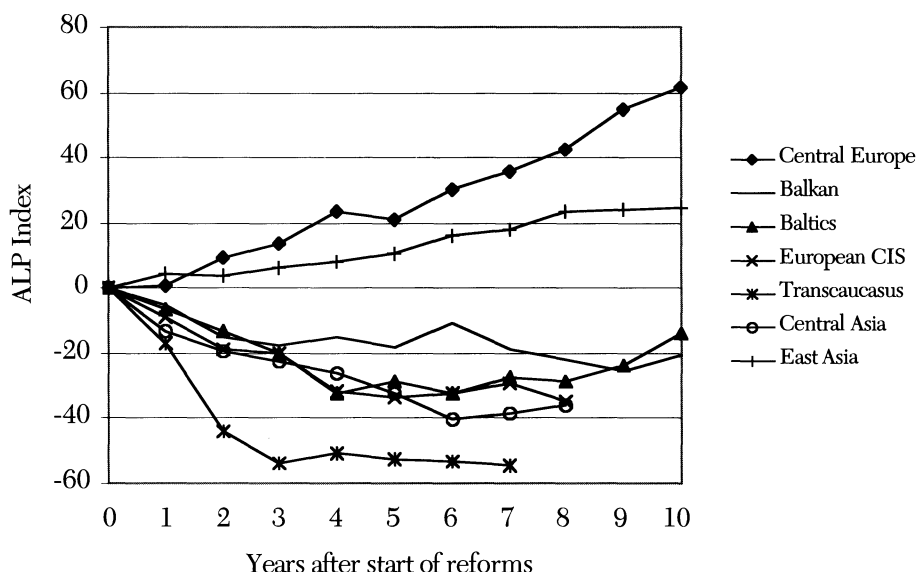


Figure 2. Changes in Agricultural Labor Productivity (output per farm worker—ALP) index during first 10 years of reform in transition countries. European CIS excludes Moldova; Transcaucasus excludes Georgia; East Asia includes China and Vietnam only. Data source: see Table 2.

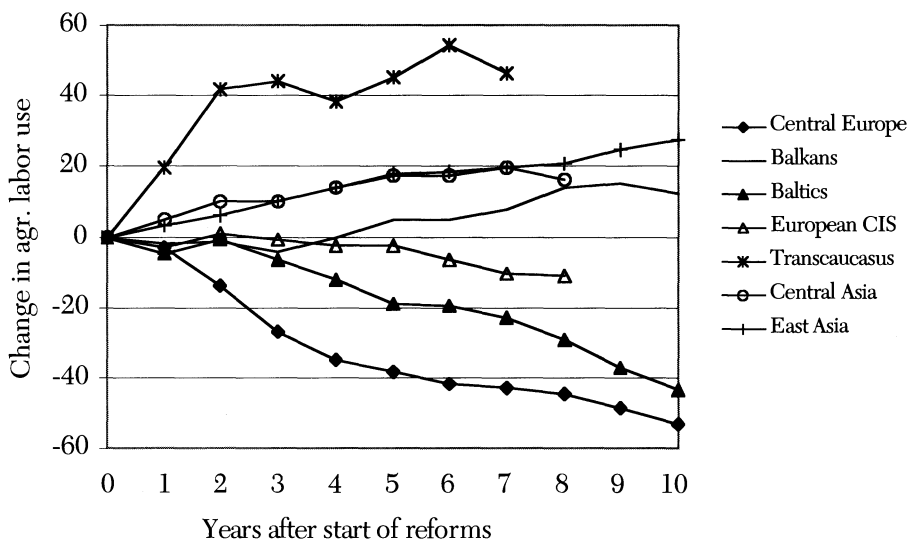


Figure 3. Changes in Agricultural Labor Use Index during First 8 Years in Transition Countries. European CIS excludes Moldova; Transcaucasus excludes Georgia; East Asia includes China and Vietnam only. Data source: see Table 4, columns 7 and 8.

after the initiation of the reforms. The paths of ALP for Russia, Ukraine, and Central Asia also mirror those of the national output, falling between 35 and 50 percent between 1990 and 1999. Agricultural labor productivity trends

for several CEE countries, however, differ from those of output, actually outperforming East Asia (figure 2; table 2). For example, despite falls in aggregate output, output per worker more than doubles over the first



TABLE 2  
GROWTH OF AGRICULTURAL LABOR PRODUCTIVITY (OUTPUT PER FARM WORKER—ALP)  
IN TRANSITION COUNTRIES (INDEX EQUALS 100 IN FIRST YEAR OF REFORM)

	Year with lowest ALP	ALP index in year of lowest ALP	ALP index after 5 years	ALP index after 8/10 years*	Average annual change Year 0–5	Average annual change Year 5– 8/10
East Asia						
China	0	100	120	146 *	4.0	5.2 *
Vietnam	0	100	102	107 *	0.4	1.1 *
Myanmar	2	96	115	120	3.0	1.7
Central Asia						
Mongolia	10	57	61	60	-7.8	-0.3
Kazakhstan	6	58	60	71	-8.0	na
Kyrgyzstan	5	59	59	67	-8.2	2.9
Tajikistan	9	36	46	38	-10.8	-2.9
Turkmenistan	6	55	87	64	-2.6	-7.9
Uzbekistan	6	80	88	86	-2.4	-0.5
Transcaucasus						
Armenia	7	38	42	38	-11.6	-2.2
Azerbaijan	9	48	57	62	-8.6	1.7
Georgia	2	67	85	na	-3.0	na
European CIS						
Belarus	4	69	71	87	-5.8	4.9
Moldova	8	41	58	41	-8.4	-5.7
Russia	5	63	63	65	-7.2	-0.5
Ukraine	8	52	65	52	-7.0	-4.1
Baltics						
Estonia	1	76	139	163 *	7.8	4.7 *
Latvia	8	49	54	65 *	-9.1	2.2 *
Lithuania	5	62	62	77 *	-7.7	3.1 *
Central Europe						
Czech Rep.	1	99	126	177 *	5.2	10.2 *
Hungary	1	99	175	220 *	15.0	9.1 *
Poland	3	96	99	144 *	-0.2	9.1 *
Slovakia	0	100	110	132 *	1.9	4.4 *
Balkans						
Albania	2	77	108	104 *	1.6	-0.8 *
Bulgaria	9	60	69	63 *	-6.2	-1.1 *
Romania	9	59	67	63 *	-6.6	-0.8 *
Slovenia	3	61	85	na	-3.0	na

Sources: National statistics, ILO, World Bank, Asian Development Bank.

\* Countries with \* (China, Vietnam, Central Europe, Baltics, and Balkans) have data for ten years after start of reforms; other countries have data for eight years after start of reform.

decade after transition in Hungary. ALP also rises strongly in the Czech Republic, Slovakia, and Estonia. In Poland, Latvia, and Lithuania, although ALP falls immediately after reform, the indicator recovers and rises

after the first four years. In Albania, ALP increased rapidly between 1992 and 1995 but leveled off afterwards.

Despite the difficulties of working with official data on labor use in agriculture in

transition economies, labor-use patterns help explain part of the divergence of output and ALP patterns for some countries (figure 3).<sup>4</sup> The dramatic reduction in the use of agricultural labor drives the rise of ALP in the Central European countries. Official employment data from Central Europe show an average reduction of labor use of 35 percent during the first five years of transition. The strongest reductions occur in Hungary (57 percent) and the Czech Republic (46 percent). The same process occurs in Estonia, a country in which labor use declines by 58 percent within the first five years of reform.

<sup>4</sup> Official data on labor use in transition agriculture are prone to measurement errors and statistical problems and should be interpreted with care. Different data sources often provide different numbers and do not always distinguish between full- and part-time employment. Hence, in countries in which more part-time work is being done, but which continue to report all producers involved in agricultural production as full-time labor units, labor productivity trends will be understated. Also, the aggregate data hide important other reallocations of labor. For example, while overall labor use in agriculture in China rose slightly during the first five years after reform (10 percent), major efficiency gains in cropping occurred from the reallocation of labor from crops to livestock production and other sideline activities (e.g., various self-employed enterprises—Nicholas Lardy 1983; Shenggen Fan 1991; Jin et al. 2002). Also, in other transition countries official labor data hide important changes in effective labor input. For example, in some of the CIS countries where former collective and state farms have survived, labor is often underemployed and members of rural households are officially still employed on these farms, even though they often spend a considerable part of their time working on their own household plots and are engaged in a myriad of other sideline activities (Zvi Lerman, Csaba Csaki, and Gershon Feder 2002). In such countries, the effect of these misreportings are ambiguous and depend on whether or not the output produced on their own plots are included in output figures. If private plot output is included, we, in fact, will be measuring rising productivity when it is actually rising. If the output of these plots is not included in reported output, labor productivity measures will be underreported like those in countries in which agricultural laborers are shifting from full- to part-time farmers. We use data from the Asian Development Bank for Azerbaijan, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, and Uzbekistan, because for most of these countries there are no consistent data in the ILO's database for the full period.

In contrast, agricultural labor use rises in East Asia and part of the CIS nations, affecting ALP in either a neutral or negative way (figure 3). For example, although ALP rises in East Asia, as it does in Central Europe, labor use does not fall. Labor use in agriculture (as a whole—that is, cropping, livestock, and other subsectors) actually increases in both China (10 percent) and Vietnam (25 percent). In both countries, the increase in ALP evidently comes from the strong increase in output. Agricultural labor use also increases in some CIS countries, in particular in Central Asia.<sup>5</sup> For example, in Kyrgyzstan, agricultural employment surged between 1990 and 2000, rising by 64 percent (ILO 2001). There, as in other countries in the region, a rising number of people in agriculture coupled with stagnant output led to a fall in ALP.

The performance of yields parallels those of ALP (table 3; figure 4). In China, yields increase rapidly from the beginning of transition, rising by 12 percent annually during the first five years after reform (row 1). Between five and ten years after reform, yields continue to rise, although the rate of rise slows. Pingali and Xuan (1992) also document the rise in yields during the early years of Vietnam's transition. In contrast, average yields fall during the first few years after reform for all CEE and CIS countries.<sup>6</sup>

<sup>5</sup> A number of factors increased the size in terms of laborers of the agricultural sector in countries such as Romania, Armenia, and several Central Asian nations. Policy, demographic and macroeconomic pressures, and other factors contributed to the rise of agricultural labor use in many countries, for example, in countries where the agricultural sector worked as a buffer after collapse of the industrial economy (e.g. Romania, Kyrgyzstan), and in fact absorbed labor from other sectors. As in Vietnam, rapid population growth also contributed partly to the labor inflow in several Muslim countries, such as Uzbekistan and Turkmenistan. Finally, other events also contributed to rising agricultural labor. For example, in Armenia a regional conflict disrupted critical imports and industrial production, and many people migrated to rural areas.

<sup>6</sup> In table 5, the only exception is Romania, where strong increases in dairy yields more than offset declines in crop yields.

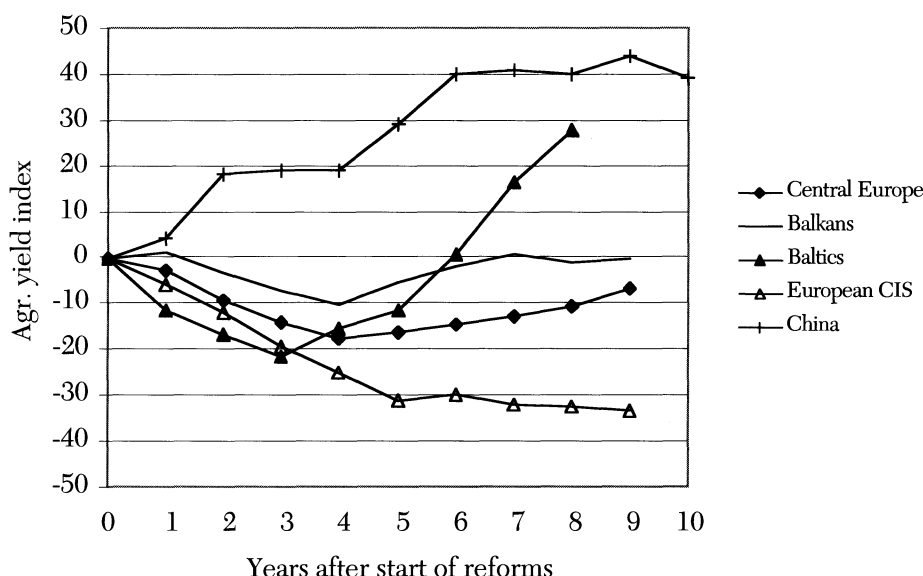


Figure 4. Change in Average Agricultural Yield Index during First 10 Years of Reform in Transition Countries. Agricultural yield index is calculated as the average yield index of grains, sugar beet/cotton, and milk. Data source: see Table 3, columns 7 and 8.

But, as in the case of labor productivity, after the initial post-transition years, the paths of yields differ strongly between the two regions after the first several years of reform. Figure 4 summarizes yield evolutions for selected crops (grains, sugarbeet, and cotton) and milk. In the European CIS states, including Russia and Ukraine, yields fall rapidly during the first five years to levels about 25 percent lower than pre-reform yields. In the second part of the 1990s yields stay at this low level and in some cases continue to decline. In Central Asia, yields also fall by more than 25 percent during the first years of transition. In the final years of the first decade of reform, the yields of some crops, such as grains, begin to recover; those of cotton, however, the most important commodity in several Central Asian countries, continue to fall.

In contrast, in Central Europe, yields not only decline less than those in the CIS states, by 10 to 15 percent on average during the first few years of transition, they also begin recovering faster (generally from the

third year of transition onward). Between 1992 and 1999 agricultural yields increase, on average, by 2.5 percent annually. A similar but more pronounced yield pattern can be observed in the Baltics. Average yields in the Baltics dropped initially to almost 25 percent below their pre-reform levels. In the second half of the mid-1990s, however, they recover, rising by an average of 3 percent annually. As in Central Europe, yields decline less in the Balkan countries, only 10 to 15 percent (in total) on average, although their yield recovery is slower, an average of 0.9 percent annually during the second half of the 1990s.

In the same way that changes in labor use affect ALP, changes in the use of inputs (including labor and other inputs, such as land and fertilizer) affect yields, although different inputs exhibit different rates of change (table 4). Tractor use, for example, declines sharply in most countries to around 70 percent of the pre-reform rate (columns 3 and 4). The input that best reflects the differences in how input use has responded is fertilizer (columns 1 and

TABLE 3  
GROWTH OF INDEX OF AGRICULTURAL YIELDS IN TRANSITION COUNTRIES  
(INDEX EQUALS 100 IN FIRST YEAR OF REFORM)

		Grains <sup>a</sup>		Sugarbeet / Cotton		Milk		Average Agr. <sup>c</sup>		Av. Agr. per year	
		5	10	5	10	5	10	5	10	0-5	5-10
East Asia	China	133	142	207	211	96	113	145.3	155.3	9.1	2.0
Central Asia	Kazakhstan <sup>b</sup>	41	59	79	55	na	na	60.1	57.4	-8.0	-0.6
	Kyrgyzstan <sup>b</sup>	57	93	79	96	na	na	68.0	94.9	-6.4	5.4
	Tajikistan <sup>b</sup>	66	85	52	51	na	na	59.4	68.3	-8.1	1.8
	Turkmenistan <sup>b</sup>	82	108	79	62	na	na	80.7	85.0	-3.9	0.9
	Uzbekistan <sup>b</sup>	100	148	95	80	na	na	97.8	114.0	-0.4	3.2
European CIS	Belarus	74	64	66	92	77	70	72.3	75.3	-5.5	0.6
	Moldova	82	90	na	na	51	54	na	na	na	na
	Russia	63	61	80	79	74	84	72.3	74.7	-5.5	0.5
	Ukraine	70	56	88	76	77	81	78.3	71.0	-4.3	-1.5
Baltics	Estonia	69	80	103	109	86	112	86.0	100.3	-2.8	2.9
	Latvia	71	98	88	97	89	116	82.7	103.7	-3.5	4.2
	Lithuania	61	81	100	100	81	93	80.7	91.3	-3.9	2.1
Central Europe	Czech Republic	87	89	102	131	100	126	96.3	115.3	-0.7	3.8
	Hungary	72	83	72	101	95	110	79.7	98.0	-4.1	3.7
	Poland	80	93	86	99	96	108	87.3	100.0	-2.5	2.5
	Slovakia	89	89	99	117	89	116	92.3	107.3	-1.5	3.0
Balkans	Albania	85	86	72	76	125	138	94.0	100.0	-1.2	1.2
	Bulgaria	63	65	57	72	86	90	68.7	75.7	-6.3	1.4
	Romania	85	93	80	81	137	134	100.7	102.7	0.1	0.4
	Slovenia	na	na	97	95	99	112	na	na	na	na

<sup>a</sup> Grains include wheat, rice (milled weight) and coarse grains.

<sup>b</sup> Central Asia: Cotton instead of sugarbeet; Average agriculture (col. 7 and 8) is average of grains and cotton only.

<sup>c</sup> Average agricultural yields is calculated as a simple average of the yields of grains, sugar beet/cotton and milk.

Sources: USDA for grains; sugarbeet yields are from FAO for Central Europe, Balkans and China, and from Zentrale Markt- und Preisberichtsstelle für Erzeugnisse der Land-, Forst-, und Ernährungswirtschaft (ZMP) and FAO for Central Asia, Transcaucasus, and European CIS. Milk yields are from ZMP for Central Europe, Balkans, Central Asia, Transcaucasus, and European CIS, and from State Statistical Bureau (SSB) for China.

2). In cases, such as China, fertilizer application rates soar during the reform period, rising by more than 300 percent (Bruce Stone 1988). While part of the reason that fertilizer use rises so much in China and Vietnam is the release of supply-side constraints, reform policies also are important (Qiaolun Ye and Scott Rozelle 1994; Pingali and Xuan 1992). In contrast, fertilizer use plummets in most CEE and CIS countries to around one-quarter of the pre-reform level of fertilizer use. On average, in the late 1990s fertilizer use outside East Asia is only 25 to 30 percent of its level in the late 1980s.

Although it is possible that partial and more complete measures of productivity could move in opposite directions, most of the evidence from the transition literature shows that, in fact, total factor productivity (TFP) trends move largely in the same direction as the partial measures (table 5). Several series of TFP estimates have been produced for China's agriculture (McMillan, Whalley, and Zhu 1989; Shenggen Fan 1991, 1997; Lin 1992; Guangzhong Wen 1993; Jikun Huang and Rozelle 1996; Jin et al. 2002—see rows 1 to 5 for Jin et al.'s estimates). The studies uniformly demonstrate

TABLE 4  
GROWTH OF INPUT USE INDEXES FOR AGRICULTURE IN TRANSITION COUNTRIES  
(INDEX EQUALS 100 IN FIRST YEAR OF REFORM)

		Fertilizers		Tractors		Land		Labor		Animal stock**	
		5	10	5	10	5	10	5	8*	5	10
East Asia	China	168	233	152	157	111	125	110	110	108	140
	Vietnam	239	343	92	139	98	98	125	131	157	177
	Laos	510	760	114	131	101	104	Na	na	139	183
	Myanmar	174	189	92	79	100	101	Na	na	95	104
Central Asia	Mongolia	14	19	67	64	94	94	137	152	112	124
	Kazakhstan	16	5	78	29	96	96	89	58	77	38
	Kyrgyzstan	na	na	99	104	99	102	135	146	61	61
	Tajikistan	30	17	84	84	97	96	131	130	86	75
	Turkmenistan	40	21	80	80	73	73	121	137	124	89
	Uzbekistan	34	60	94	94	89	89	112	111	116	112
Transcaucasus	Armenia	11	9	119	120	102	108	194	200	57	54
	Azerbaijan	na	na	90	99	96	100	97	100	82	101
	Georgia	22	29	71	43	86	86	76	na	49	57
European CIS	Belarus	25	40	92	62	98	97	86	73	79	64
	Moldova	42	2	93	78	102	102	114	111	64	32
	Russia	11	9	82	61	98	98	100	92	74	47
	Ukraine	24	11	92	68	100	99	106	102	75	41
Baltics	Estonia	17	20	106	109	107	106	40	35	50	32
	Latvia	21	53	82	89	99	97	79	77	38	26
	Lithuania	10	16	118	137	100	100	113	103	52	41
Central Europe	Czech Rep.	29	24	58	82	103	103	54	44	69	53
	Hungary	15	18	72	61	94	95	43	37	59	51
	Poland	35	38	114	113	99	98	89	97	81	69
	Slovakia	17	15	89	77	100	100	71	60	65	46
Balkans	Albania	19	14	74	68	101	102	92	107	121	107
	Bulgaria	25	14	69	51	98	98	92	99	47	42
	Romania	27	17	106	110	100	100	118	110	63	50
	Slovenia	56	52	56	118	91	83	95	87	86	82

\* For Slovenia and Armenia, data are for seven years after the start of reforms.

\*\* Since 1995 animal stock refers only to the change in cattle stock, the index for previous years measures an aggregate of "animal units."

Average Asia excludes Mongolia.

Sources: Data on fertilizer, tractor, land use, and animal stock are from FAO; labor data from Asian Development Bank, ILO, national statistics, and World Bank.

that in the first years after reform (1978 to 1984), comprehensive measures of productivity (either constructed TFP indices or their regression-based equivalents) rose by 5 to 10 percent per year. Although Wen (1993) worries that TFP quit growing in the post-reform period (1985 to 1989), Fan (1997) and Jin et al. (2002) demonstrate that during the 1990s, TFP continues to rise at a

rate of around 2 percent per year. Pingali and Xuan (1992) demonstrate that during the early reform period in Vietnam between 1980 and 1985, the productivity of agriculture (in this case rice, which makes up a large part of the nation's agricultural output) rises by 2 to 3 percent annually. Although no one has analyzed the rise in productivity between years five and ten after the

TABLE 5  
ANNUAL GROWTH RATES OF TOTAL FACTOR PRODUCTIVITY FOR AGRICULTURE  
IN VARIOUS TRANSITION COUNTRIES FOR SELECTED YEARS (PERCENT)

			1979-94	1979-84	1984-89	1989-94
East Asia	China	rice	3.8	9.1	0.4	2.0
		wheat	5.6	12.8	1.2	2.6
		maize	6.1	13.5	-1.0	5.6
		soybean	4.8	7.7	-1.6	8.1
		crops (av.)	5.1	10.8	-0.2	4.6
			1976-80	1980-85	1993-98	
	Vietnam	rice			3.0	
	North	rice	-3.3	5.0	2.1	
	South	rice	0.0	3.3	4.3	
	Vietnam	crops			1.0	
	North	crops			-0.7	
	South	crops			3.0	
			1992-97			
Centr. Asia	Kazakhstan	GAO	-1.0			
	Kyrgyzstan	GAO	-0.4			
	Tajikistan	GAO	-2.4			
	Turkmenistan	GAO	-5.8			
	Uzbekistan	GAO	-2.2			
Transcaucasus	Armenia	GAO	4.6			
	Azerbaijan	GAO	-0.8			
	Georgia	GAO	6.6			
Eur. CIS	Belarus	GAO	0.6			
	Moldova	GAO	0.4			
	Russia	GAO	1.4			
	Ukraine	GAO	0.4			
Baltics	Estonia	GAO	2.8			
	Latvia	GAO	-1.2			
	Lithuania	GAO	3.6			
			1989-95	1989-92	1992-95	
Centr. Eur	Czech Rep.	crops	2.7	1.1	4.3	
	Hungary	crops	1.1	-4.5	6.7	
	Poland	crops	-0.4	-5.1	4.3	
	Slovakia	crops	1.2	-0.6	3.1	
Balkans	Albania	crops	0.0	-9.3	9.2	
	Bulgaria	crops	-1.8	-7.5	3.8	
	Romania	crops	0.5	-7.8	8.7	
	Slovenia	crops	--	-3.4	--	

Sources: China from Jin et al. (2002); Vietnam from Pingali and Xuan (1992), and Benjamin and Brandt (2001); FSU from Lerman et al. (2003); Central Europe and Balkans from Macours and Swinnen (2000a).

\*GAO: gross agricultural output.

reforms, Benjamin and Brandt (2001) estimate that between 1992 and 1997, TFP for rice and total crop output generally continues to rise in Vietnam (though in the case of total crop output, TFP growth differs

between the south—positive, and the north—negative).

Estimates of TFP changes in CEE and the CIS countries also show that measures of TFP generally move in a manner consistent

with the partial ones (table 5). Macours and Swinnen (2000a) estimate that TFP indices in Central European agriculture decline during the first three years of transition (between 1989 and 1991) by 2.3 percent annually. The indices, however, rebound strongly after three years of reforms, rising by 4.5 percent annually between 1992 and 1995. The Balkan countries demonstrate a similar but more pronounced pattern, falling by around 7 percent annually over the first three years before increasing by more than 7 percent annually during the subsequent three years. TFP estimates by Zvi Lerman et al. (2003) show that productivity increases between 1992 and 1997 in two Baltic countries (Estonia and Lithuania) and, quite strongly, in two Transcaucasian countries, Armenia and Georgia. Similar to the movements of labor productivity and yields, TFP declines significantly in the Central Asian countries.

Perhaps because of the size and strategic importance of Russia and Ukraine, relatively more work on TFP has been done on these countries, although the results are less consistent than those for other parts of the reforming world. For example, Lyubov Kurkalova and Helen Jensen (2003) find that technical efficiency on Ukrainian collective and state farms declined during early transition (1989–92). Likewise, several studies find that the efficiency of Russian farms also declines significantly during transition, results that are consistent with the trends in ALP and yields (Sergey Sotnikov 1998; David Sedik, Michael Trueblood, and Carlos Arnade 1999; and Trueblood and Stefan Osborne 2001). Trueblood and Osborne (2001), for example, conclude that their results “*support the conventional wisdom that overall productivity [in Russian agriculture] has declined in the reform period*” (p. 10) and that productivity declines by 2.1 percent annually between 1993 and 1998 and they find “*no evidence of a productivity rebound.*”

The cases of Russia and Ukraine, however, are perhaps the only ones in which the

partial measures differ from the TFP measures from *some* of the studies. Lerman et al. (2003) estimate that TFP increases in Russia and Ukraine between 1992 and 1997, a time when its partial measures are falling. Likewise, Olga Murova, Michael Trueblood, and Keith Coble (2001) find a slight increase in technical efficiency of Ukrainian crop farming over the 1991 to 1996 period.<sup>7</sup>

In summary, the records of transition countries differ across regions and over time within regions. Different criteria also paint different pictures of success. In the early reform years, East Asian transition countries clearly performed the best during the first years of reform in terms of both output and productivity. After an initial few years, however, several CEE countries began to experience rising productivity, measured either as labor productivity (ALP), yields, or TFP. Productivity measures rose throughout the later transition period (years four to ten) in both Central Europe and East Asia, even though the direction of output in the two sets of countries moved in opposite directions. Productivity in Central Europe rose even as output fell, primarily because inputs fell even faster. Hence, when critics of the transition in CEE nations point to the collapse of output as an indicator of poor economic performance, it is not clear that they always have a valid point. According to the TFP measures, the efficiency of producers of a number of CEE transition nations improved significantly a few years after transition. Such a pattern not only characterizes Central European countries but also several Baltic and some Balkan countries.

The record is less positive in the CIS. Output and labor productivity fell sharply in

<sup>7</sup> As we will explain in section 3, the inconsistent results for Russia are likely due to differences in sampling and reflect variations in the performance of different farm structures with the countries. An update of the Lerman et al. (2001) calculations indicates that TFP increases in Russia and Ukraine are due mostly to increases after 1995, as TFP declined before then.

almost all CIS countries during most of the first decade of reform. Hence, according to both partial and most full measures, productivity during the first ten years of reform fell in most CIS nations. Despite this, there is evidence that TFP increased in some Transcaucasian countries, such as Armenia and Georgia. Moreover, some studies indicate that TFP may have increased in Russia and Ukraine, especially in the second half of the 1990s. The findings of these studies contradict those from the rest of the literature. Interestingly, and perhaps a sign that productivity trends are beginning to turn even in the slower-moving CIS, indicators in some nations show that although productivity fell with output during a significant part of the first decade, there is evidence of improvements in productivity since the late 1990s (EBRD 2002).

### 3. *Prices, Rights, and Markets: Determinants of Success and Failure*

While previous research on the determinants of the success of transition economies has identified a number of important factors, we examine three in this section. We examine shifts in price and subsidy policy, property rights reform and farm restructuring, and market liberalization, mainly because they have played a role—sometimes positive and sometimes not—in most transition economies. Because of complicated ways that the policies and interactions of policies affect performance, we first review the policies and defer examination of their effects until they can be looked at together. In addition to these three sets of factors, others surely also affect the performance of different transition countries (e.g., initial level of development at the time of reform—Sachs and Woo 1994; Macours and Swinnen 2000b; the speed of reform—McMillan and Naughton 1992; political economy and regional tensions—Roland 2000; Martha de Melo and Alan Gelb 1996; and the management of public investments—Huang and Rozelle 1996; Csaba

Csaki 1998; Shenggen Fan, Linxiu Zhang, and Xiaobo Zhang 2002).

#### 3.1 *Prices and Subsidies*

The administration of prices by the socialist planning apparatus is one of the most distinguishing characteristics of pre-transition countries. While in some countries leaders allowed subsets of goods to be traded out of the plan, for most high-priority commodities—which almost always included food and fiber—planning ministries in most nations allocated goods and services mostly on the basis of quantity-based plans. Prices mostly served accounting functions.

Despite the similarities, there were several critical differences among nations. In setting the prices of agricultural goods, inputs, and services, the ratio of input to output prices faced by producers differed greatly among the countries. For example, in China and Vietnam before reform, authorities used administrative prices to impose a heavy tax on agriculture by requiring farmers to deliver their output at artificially low prices (Lardy 1983; Sicular 1988a; Green and Vokes 1998). In contrast, leaders in most of the CEE and the CIS nations supported agriculture with heavy subsidies, typically setting artificially low prices for inputs and relatively high prices for output (Edward Cook, William Liefert, and Robert Koopman 1991; Andrzej Kwiecinski and Natacha Pescatore 2000; Liefert et al. 1996; USDA 1994; Thomas Tomich, Peter Kilby, and Bruce Johnston 1995). The extent to which prices were above or below the market price prior to an economy's transition almost certainly would have different consequences for the sector's performance as reformers tried to bring the nation's price structure closer to that of the rest of the world.

In East Asia, perhaps one of the least appreciated moves of the early reformers was their bold decision to *administratively* increase the price of farm goods that were to be received by farmers (Nicholas Lardy 1983; Terry Sicular 1988b). Between 1978



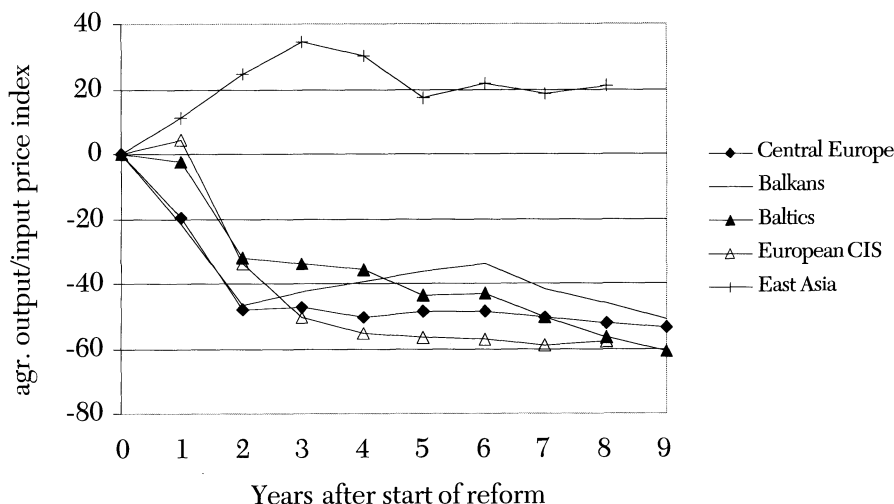


Figure 5. Change in Gross Agricultural Terms of Trade Index (grain to fertilizer price ratio) during first 10 years of reform in transition countries. \* Balkans exclude Albania and Bulgaria; Baltics exclude Latvia; European CIS excludes Moldova; East Asia includes China and Vietnam only. Data source: OECD and national statistics for China.

and 1983, in a number of separate actions, planners in China increased the above-quota price, the payment farmers received for voluntary sales beyond the mandatory deliveries, by 41 percent for grain and by around 50 percent for cash crops (Sicular 1988b). According to the State Statistical Bureau's data, the relative price of grain to fertilizer rose by more than 60 percent during the first three years after reform (figure 5). During the early reform years, the rise in above-quota price represented a higher output price at the margin to farmers, since until 1984, state-run procurement stations regularly purchased all grain sold by farmers at the above-quota price as long as they had already fulfilled their mandatory marketing delivery quota which was purchased at a state-set quota price, which for the case of rice, for example, was 50 percent below the above-quota price (Sicular 1995).<sup>8</sup>

<sup>8</sup> Although the statistical bureau did report a "market" price at that time (which actually was about the same level as the above-quota price), such a small amount of grain (and less of fiber and oil seeds) was sold on markets, since rules still tightly controlled the distance of shipment and the goods that could be bought and sold, that most farmers did not consider the market price as their opportunity cost.

The important contribution of China's pricing policy is the timing and breadth of the policy change. The first major price rise occurred in 1979, almost at the same time reformers were deciding to decollectivize. However, given the leadership's decision to gradually implement the Household Responsibility System (HRS), beginning first in the poorest areas of China, the price increases immediately affected all farmers, both those in areas that had been decollectivized and those that had not. By 1981, the time of the second major price increase, according to Lin (1992), less than half of China's farmers had been allowed to dismantle their communes. Hence, as long as there was some, albeit weak, link between the output price and production, the *plan-based* price rise would have led to increases in China's farm output.

During its first years of reform, Vietnam followed an almost identical path (Csaki 1998). As in China, almost a decade before Vietnam's leaders abolished the state's procurement system and formally allowed private traders to directly purchase agricultural goods from farmers, leaders raised prices administratively and increased the profits

earned by the farmers (Pradumna Rana and Naved Hamid 1996). According to official data from Vietnam, during the first five years of the reforms, the output-to-input price ratio rose more than 35 percent above its pre-reform level. Like China, the price rise occurred at a time when Vietnam was just beginning to push its Doi Moi decollectivization policies and more than ten to fifteen years before land titles were issued.

During the entire pre- and post-reform period, input prices—especially of fertilizer—were still mostly controlled by the state's monopoly agricultural inputs supply corporations in China and Vietnam (Bruce Stone 1988; Prabhu Pingali and Nguyen Tri Khiem 1995). Although short in supply, the governments in both countries controlled the price of fertilizer and other inputs (such as pesticides, diesel fuel, and electricity) as well as their distribution (Dorothy Solinger 1984). Communes received low-priced fertilizer from the state, but almost all of it was inframarginal. In other words, the government-supplied, subsidized fertilizer was not sufficient to meet the needs of most farmers. Producers in both the pre- and post-reform periods typically purchased additional fertilizer from the state at a higher price (Ye and Rozelle 1994). Hence, unlike other transition and developing countries, at the margin, farmers in China and Vietnam were not able to purchase fertilizer at highly subsidized rates. In fact, according to Jikun Huang and Chunlai Chen (1999), during the 1980s the real price of China's fertilizer was above the international price. Vietnam was in a similar position early during its reforms (Pingali and Xuan 1992). Although both nations raised the price of fertilizer somewhat under rising foreign exchange and budgetary pressures in the mid-1980s, the rise was not large enough to eliminate the positive incentives created by higher output prices (World Bank 1997).<sup>9</sup>

<sup>9</sup> To the extent that access to fertilizer improved during the reform (Stone 1988), the shadow prices of fertilizer would also have fallen, which would also encourage higher output.

Although price and subsidy reforms were much bolder in CEE and CIS countries than in East Asia, there were differences among regions. In Central Europe, governments immediately dismantled the planning system by decontrolling agricultural prices and dramatically reducing subsidies (Jason Hartell and Johan Swinnen 1998; Alexandra Trzeciak-Duval 1999). For example, Estonia, the most radical reformer of countries previously belonging to the Soviet Union, totally liberalized output and input prices between 1990 and 1992. In most CIS countries, however, reformers decontrolled prices more gradually (Csaba Csaki and John Nash 1997; Csaki and Achim Fock 2001). Russian reformers liberalized output prices in the early reforms, but certain key input subsidies continued. On the other hand, in countries like Belarus, Uzbekistan and Turkmenistan (the least radical reformers), price controls on both outputs and inputs continued far into the 1990s.

Yet, the main difference between CEE/CIS and East Asian transition countries is not in their administration of price reform; rather, it is in the direction of the price adjustments (figure 5). In East Asia, pro-urban policies that used low procurement prices during the planning era to subsidize consumers (who also were workers on the front line of East Asia's heavy industry-led development strategy) led to artificially low farm gate prices. Price reforms that sought to set more realistic prices (i.e., those that in some sense reflected the market value of the commodities) raised prices. In CEE and in the CIS nations, since output prices had previously been supported above equilibrium prices and input prices had been heavily subsidized, price liberalization caused substantive declines in agricultural terms of trade. In the first five years of transition, for example, output-to-input prices in agriculture fell more than 30 percent in Hungary, 50 percent in the Czech Republic, and at least 70 percent in Slovakia, Poland, Russia, Ukraine, and some of the Baltics. In these countries

the combination of the fall in the real price of output and the sharp rise in the real price of inputs led to a severe drop in production in most agricultural sectors and food crises in a number of them (OECD 1998).

### 3.2 Property Rights Reform and Farm Restructuring

Although there were many differences among countries in the organization of their agricultural sectors prior to reform, in most cases farm production units shared several key characteristics (Lardy 1983; Pingali and Xuan 1992; Lerman, Csaki, and Feder 2004). Prohibiting private farming, socialist ideals favored large, corporate organizations. In some nations, state-owned farms dominated the landscape. Those that worked the land on state farms typically were paid a wage, drew a pension, and performed work assignments handed down by managers, which were often part of a larger national or regional plan. Farms were theoretically organized on the same principles as factory enterprises, and farmers became workers. The state made investments, set planting plans, purchased inputs through planning channels, and remitted profits up through the ministerial system. In other countries, farms were run as collectives. Like state farms in most respects, the main difference was that instead of drawing a wage, collective members earned work points that entitled them to a share of the harvest that was left over after deductions were made for input purchases, taxes, quota deliveries, and investment retentions.

Whatever the exact organizational form, wage- and point-earning farmworkers typically faced few incentives to work hard, since their compensation was at most only loosely tied to either their effort or the farm's profitability. Unlike industrial factories, however, monitoring farm workers was difficult. Logistics often compounded the problems. Planning necessities (e.g., arranging for the procurement of inputs and disposal of output) meant that farms in most countries

were quite large. The large scale of farms, in turn, meant that managers were often charged with trying to direct work of many individuals that on a day-to-day basis were physically spread out over a spatially dispersed area. In almost all studies of pre-reform agriculture collective and state farms were found to be inefficient (Joseph Brada and Arthur King 1993; Karen Brooks 1983; Robert Meade 2000; Lin 1990; Louis Putterman 1992).

Searching for ways to make their economies more productive, reformers had several options for eliminating inefficiencies. First, they could try to provide better incentives to elicit more effort. Second, leaders could try to reduce the operational size of the farming unit to improve information about on-farm production needs. In this same spirit, it was thought that if planning was reduced by giving more decision-making authority to producers (i.e., give them better control rights) producers could produce more efficiently. Finally, reformers could try to facilitate the reduction or better allocation of inputs, including labor, that were being wasted. All countries, albeit with differing degrees of emphasis, tried to tap these sources of productivity gains.

In fact, recognition of the shortcomings of the system and the launching of the wave of reforms in the 1980s in East Asian nations and in the 1990s in CEE and the CIS nations was not new. Some CEE countries attempted market-oriented reforms before 1989, mostly in the form of measures that increased enterprise autonomy (Josef Brada and Karl-Eugen Wädekkin 1988). Poland introduced reforms in management of their cooperatives and state-owned enterprises in the early 1980s.<sup>10</sup> Gorbachev followed later in the 1980s.<sup>11</sup> Hungary's leader

<sup>10</sup> In Poland and Yugoslavia the farm sector remained dominated by private family farms throughout the Communist regime. Hence reforms targeted other parts of the agri-food system.

<sup>11</sup> Gorbachev also launched a major investigation into corruption in the Uzbekistan cotton regime.

went considerably beyond this by abolishing mandatory planning even earlier in 1968. Yugoslavia had begun to introduce self-management in 1965. In contrast, Czechoslovakia and Romania had little or no history of significant reforms prior to 1988.

Most pre-1989 reforms in CEE and CIS nations, did not achieve their objectives (Kenneth Gray 1990; Stephen Wegren 1998). Communist leaders had hoped that if enterprise managers were given more autonomy in determining output and prices, they would show more profit awareness and increase enterprise performance. Instead, in many cases enterprises started distributing most of any rising value added to workers and managers in the form of wages. With soft budget constraints, enterprises started bargaining with the central authorities for more resources, contributing to macroeconomic imbalances (Roland 2000).

In light of the earlier failures and in response to mounting pressures caused by the poor performance of agriculture (among other sectors), reformers after 1989 in most CEE and CIS countries—and earlier in East Asia—decided to make fundamental changes in property rights. Consisting of control rights (that is, who gets to decide what to plant and what inputs to use) and income rights (who gets the residual income generated by the productive activity), the final form and mix of property rights differed greatly across different countries. In some cases reformers only granted partial property rights to farmers. For example, reformers sometimes provided income rights, but few control rights. In other cases leaders provided nearly full control rights with only partial income rights. Ownership changes (that is, who received alienation rights to land and other farm assets) were often considered separately from questions of farm restructuring; likewise, restructuring sometimes occurred independently of changes in rights. Almost always, the reforms to property rights in the new wave of policy changes in the 1980s and 1990s were accompanied by a reduction in

the propensity of the state to planning (gradually in China and Vietnam; and more rapidly in the CEE and CIS nations).

*Rights Reform in East Asia: Incentives, Individualization, and Incomplete Privatization.* East Asia's reformers, more than anything, have followed a strategy based on providing incentives through property-rights reforms, even though in China and Vietnam the shift to private ownership is today far from complete (table 6). The reforms in China started with the Household Responsibility System (HRS), a policy of radical decollectivization that allowed farmers to keep the residual output of their farms after paying their agricultural taxes and completing their mandatory delivery quotas. Farmers also began to exercise control over much of the production process (although in the initial years, the local state shared some control rights and in some places still does today). In this way the first reforms in the agricultural sector reshuffled property rights in an attempt to increase work incentives and exploit the specific knowledge of individuals about the production process (Perkins 1988).

In executing the property rights reforms, leaders also fundamentally restructured farms in China and Vietnam. Within a few years, for example, reformers completely broke up the larger collective farms into small household farms (figure 6; table 7). In China today there are more than 200 million farms, the legacy of an HRS policy that gave the primary responsibilities for farming to the individual household. There are more than ten million farms in Vietnam.

The process of planning also began to take on a less important role (Sicular 1988b). In China, for example, marketed surplus delivery quotas were divided into basic and above-quota quotas. In addition to being given higher payment for above-quota quota deliveries, farmers were given more scope in deciding what to produce. Planners gave more discretion to farmers over a variety of products, such as eggs, certain meats, fish, and horticulture goods. Vietnamese

TABLE 6  
SCOPE OF PROPERTY RIGHTS REFORM FOR AGRICULTURE IN TRANSITION COUNTRIES

		Land Reform Procedure	Individual Use Rights	Transfer of Use Rights	Individual Ownership Rights	Transfer of Ownership Rights	Progress in Land Reform	
							after 5 years	after 10 years
East Asia	China	Distribution	x	-	na	na	8	na
	Vietnam	Distribution	x	-	na	na	8	na
	Laos	Distribution	x	-	na	na	8	na
	Myanmar	--	x	X	na	na	8	na
Central Asia	Mongolia	Distribution	x	-	na	na	na	na
	Kazakhstan	Distribution in shares	x	X	-	-	5	5
	Kyrgyzstan	Distribution in shares	x	X	x	-	6	7
	Tajikistan	Distribution in shares	x	X	-	-	2	5
	Turkmenistan	Distribution in shares	x	-	x	-	2	3
	Uzbekistan	Distribution in shares	x	-	-	-	1	2
Transcaucasus	Armenia	Distribution	x	X	x	X	8	8
	Azerbaijan	Distribution	x	X	x	X	6	8
	Georgia	Distribution	x	X	x	X	7	6
European CIS	Belarus	Distribution in shares	x	-	-	1	2	
	Moldova	Distribution in shares	x	X	x	X	6	7
	Russia	Distribution in shares	x	X	x	-	5	5
	Ukraine	Distribution in shares	x	X	x	-	5	6
Baltics	Estonia	Restitution	x	X	x	X	6	8
	Latvia	Restitution	x	X	x	X	9	9
	Lithuania	Restitution	x	X	x	X	8	8
Central Europe	Czech Rep.	Restitution	x	X	x	X	8	8
	Hungary	Restit+Distr+Voucher	x	X	x	X	9	9
	Poland	--	x	X	x	X	8	8
	Slovakia	Restitution	x	X	x	X	7	8
Balkans	Albania	Distribution	x	X	x	X	8	8
	Bulgaria	Restitution	x	X	x	X	7	8
	Romania	Restitution+Distr.	x	X	x	X	7	8
	Slovenia	--	x	X	x	X	9	9

Sources: Csaki and Tuck (2000), Lerman (2001), and Macours and Swinnen (2002).

reformers carried out similar reforms. In the rest of the paper when reference is made to decollectivization or the implementation of HRS, we are referring to a process of transfer of income and control rights to farmers *and* the initial reduction of planning (although not its immediate elimination).

The collective did not disappear, however. A companion set of reforms in the mid-1980s transformed communes into townships, the lowest level of China's formal government hierarchy. Brigade leadership committees (a sub-commune level of organization) were turned into village committees, which

became the government's representative in China's villages (Jean Oi 1999). Villages and the small groups below them (formerly production teams) retained legal ownership rights over land and are the entities that were charged with contracting land to the farmers and setting rules for land management.

Doi Moi, Vietnam's reform program in the 1980s, closely followed China's strategy (Pingali and Xuan 1992; Pingali and Khiem 1995). Faced with large food deficits and declining productivity, Vietnam switched from collectivized production to a household-oriented contract system in 1981. Designed

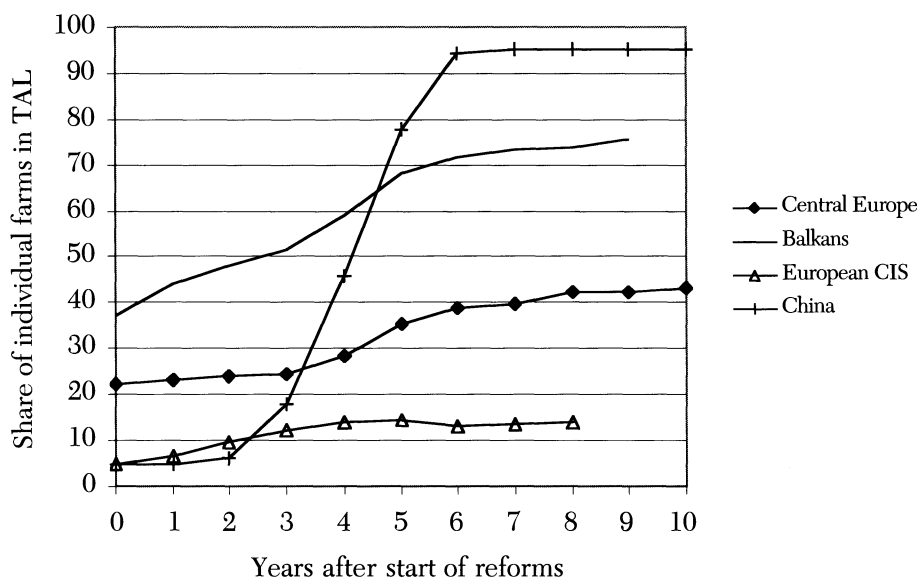


Figure 6. Share of Agricultural Land Used by Individual Farms (%). Balkans exclude Albania; European CIS excludes Moldova; East Asia includes only China. Source: see Table 7.

to provide farmers with better incentives, the reforms stipulated that individual households were to enter into a contract with the former collective. In return for maintaining productivity and selling a portion of their crop to the state at below-market prices, farmers could keep all of the output from their land. Within a few years of the initial reforms, millions of new household-based farms were established.

Only a few countries outside East Asia followed China's model of reforming property rights and farming organizations (tables 6 and 7). Several countries in the Balkans and Transcaucasus region distributed land rights for specific plots of land to individual households in rural areas.<sup>12</sup> For example, in moves that were even more radical than China's, reformers in Albania and Armenia gave households almost complete private ownership rights to their land (Azeta Cungu and Johan Swinnen 1999; Lerman et al. 1999). In Georgia, land use rights were transferred to individual farms by presidential decree in

1992, a process that contributed to the individualization of farming. Four years later these use rights were converted into private ownership rights. Azerbaijan, the third Transcaucasian state, followed the same reform strategy, although the policy moves were made after 1996 (Lerman, Csaki, and Feder 2003). What makes the reforms in these nations so special is that outside of Asia, the rest of the transition world followed a different path in their policies and rights reforms.

*Rights Reform in CEE: Restitution and Restructuring.* In contrast to East Asia, rights reform in CEE went much further than the transfer of use rights (Lerman 2000; Swinnen 1999). The dominant land reform procedure in Central Europe, the Balkans, and the Baltic countries was restitution of land to the former owners who had lost their rights during the collectivization movement in the past (table 6). If the original owners were not alive, reformers restored ownership rights to their closest heirs. Typically, land reform laws restituted land to the historical boundaries. If restitution to the original boundaries was not possible, former owners received rights to a plot of land of comparable size and quality. In

<sup>12</sup> Romania used a mixed land reform strategy, combining both land distribution and restitution.

some countries restitution was combined with other land reform programs, for example, voucher privatization (Hungary), distribution of state land (Romania), or the leasing of state-owned land (Czech Republic). If successful, the new form of farming theoretically would be more efficient since land would become a marketed input that could be transferred to the most efficient producers and would provide operators with better incentives. The new farm managers would be free to adopt a more efficient mix of inputs. Initially, however, there was a danger that restitution would result in a fragmentation of farms and a fall in efficiency (or at least a period of adjustment) since the pre-socialist distribution of land differed from the distribution of operational farms in the immediate pre-reform period.

While the restitution process resulted in the fragmentation of ownership, for several reasons it did not necessarily lead to a fragmentation of farms (figure 6). Erik Mathijs and Johan Swinnen (1998) illustrate how the nature of transaction costs in land markets actually led to a consolidation of land. Restitution in many countries gave land back to individuals who were no longer active in agriculture, most commonly to either former farmers or their heirs. Except for the case in some of the poorer countries, the new landowners did not return to farming and primarily were interested in renting their land. Because the search and negotiation costs of identifying individuals who were willing to rent the land were so high, the easiest way for the new land owners to find a renter was to contact those already using the land. Consequently, in most cases the new lessees became those who had been involved with farming on the large pre-reform farms.

Transaction costs also favored the large farmers from the point of view of their search for land to rent. Almost all of those who farmed after reform were active in agriculture prior to reform. Most were farm workers or cooperative members. Since land was restituted to people outside agriculture, if they wanted to stay in farming, they were forced to

search for the owners of the land and strike a rental contract. However, since the management of the large farms was closely involved in the restitution process, they had an information advantage in identifying the new owners. Transaction costs on both the supply and demand sides gave an advantage to large farms. As a result, after restitution, farm size did not fragment as much as had been feared. Although a small farming class did emerge everywhere, many large farms did not disappear and the agricultural sector in several CEE countries remained characterized by a dual farm structure (Alexander Sarris, Tomas Doucha, and Erik Mathijs 1999).<sup>13</sup>

In the course of transition, however, different mixes of farm structures emerged in different nations in CEE (table 7). For example, individual farming dominates now in several Baltic and Balkan countries. In contrast, large-scale privatized corporate farms still use most of the land in Central European countries, such as Slovakia and the Czech Republic. The corporate farms, all of which resulted from organizational restructuring of the collective and state farms, also are far from a homogeneous organizational form. Observers in CEE find joint-stock companies, limited-liability partnerships, and agricultural cooperatives operating in the same economic environment.

Although decollectivization did not result in a complete shift to individual farming in several countries in CEE incentives improved significantly. The reforms basically gave control and income rights to the managers of the various organizational forms. The new

<sup>13</sup> In general, the new corporate farms are smaller than the former collective and state farms, and the individual farms larger than the pre-reform household plots. The average corporate farm in CEE today is between 500 to 1000 hectares, compared to 2000 to 4000 hectares for an average collective or state farm before 1990. At the same time, however, the average size of individual farms increased (Lerman et al. 2003). For example in Hungary the average size of the large scale cooperative and corporate farms declined by 50 percent during the first five years of reform; the average size of the family farm doubled between 1991 and 1996 (Erik Mathijs and Liesbet Vranken 2004).

TABLE 7  
RESTRUCTURING OF FARMING ORGANIZATION AND GENERAL REFORM INDICATORS

		Individual Land Use			Individual Production		Agr. Reform
		pre-reform	after 5 years	after 10 years <sup>a</sup>	pre-reform	after 7 years	after 10 years
East Asia	China	5–10	98	99	na	na	na
	Vietnam	5	99	99	na	na	na
	Laos	54	99	99	na	na	na
	Myanmar	99	99	99	na	na	na
Central Asia	Mongolia	na	na	na	na	na	na
	Kazakhstan	0	5	24	28	38	5.6
	Kyrgyzstan	4	34	37	34	59	6.4
	Tajikistan	4	5	9	23	39	4.2
	Turkmenistan	2	3	8	16	30	2.0
	Uzbekistan	5	13	14	28	52	2.0
Transcaucasus	Armenia	7	95	90	35	98	7.2
	Azerbaijan	2	5	na	35	63	6.2
	Georgia	12	50	44	48	76	6.0
European CIS	Belarus	7	16	12	25	45	1.8
	Moldova	7	12	20	18	51	6.0
	Russia	2	8	13	24	55	5.6
	Ukraine	6	10	17	27	53	4.0
Baltics	Estonia	4	41	63	na	na	8.4
	Latvia	4	81	87	na	na	8.4
	Lithuania	9	64	85	na	na	7.6
Central Europe	Czech Rep.	1	19	26	na	na	8.6
	Hungary	13	22	54	na	na	8.8
	Poland	76	80	84	na	na	7.8
	Slovakia	2	5	9	na	na	7.6
Balkans	Albania	3	95	na	na	na	6.8
	Bulgaria	14	44	56	na	na	7.6
	Romania	14	71	82	na	na	6.6
	Slovenia	83	90	94	na	na	8.0

<sup>a</sup> Due to data limitations, data are for eight, nine, or ten years after the start of transition.

Sources: Csaki and Tuck (2000), Lerman (2001), and Macours and Swinnen (2002).

organizations no longer guaranteed employment to their shareholders. Moreover, they were forced to operate under hard budget constraints with a real threat of bankruptcy proceedings against those who defaulted on their loans. This radically changed the organizational behavior of farm enterprises. Many of the large farms turned into market-driven corporations (Lerman, Csaki, and Feder 2004). With such incentives managers set out to improve the efficiency of the farms. One result of the changed incentive structure is that many of the farms cut back substantially

on their labor use by laying off workers (Johan Swinnen, Liesbeth Dries, and Karen Macours 2003). Output per worker rose significantly.

*Rights Reforms in CIS Countries: Paper Shares and Poor Incentives.* In most CIS countries, such as Russia, Ukraine, Belarus, and most of Central Asia, land reform proceeded more gradually and procedurally in a different way than in East Asia or CEE (table 6).<sup>14</sup> Unlike restitutions, reformers in CIS

<sup>14</sup> The main exceptions are Armenia and Georgia (see above).



nations generally were supposed to follow a two-step process, although in practice the process was not always followed completely (Lerman 2001). In the first part, reformers transferred land from state ownership to ownership by the collective, which typically consisted of people who were living and working on the collective farms. In the second part, ownership rights were then supposed to be given to the individuals. In fact, in many nations individual households only received certificates of entitlement to land that had been shifted to the protective care of the collective. Although the certificates frequently were called land shares, they were, in fact, "paper shares" that did not establish a direct link between a specific plot of land and an individual. As a result, land reform in most CIS nations often resulted in the large-scale shift of land ownership to the collective, not to individual owners.

At least in the first decade of the reform, the share distribution system created major obstacles for restructuring CIS farms and did not always provide strong incentives to the producer (Roy Prosterman and Tim Hanstad 1999). Leaders in almost all of the countries that used share distribution also banned agricultural land from being sold or purchased during the first decade of reform (Lerman 2001).<sup>15</sup> Several of the countries also have created additional restrictions on land rights. For example, farmers in Belarus, Turkmenistan, and Uzbekistan cannot transfer use rights among themselves. Potential users of land also face high transaction costs in accessing land since the property rights on specific plots are unclear. As Vasily Uzun (2000, p. 8) observes: *"land share owners do not know where their land shares are located; managers of agricultural enterprises have an opportunity to use the land owned*

*by citizens freely and without controls; and workers, still, after nine years of reforms, do not clearly understand their choices."*<sup>16</sup>

The limitations on access to land also clearly dampen incentives to use it efficiently. The weak rights reduce pressure for restructuring of existing farm organizations by shielding them from competition for land use. Under such a system, few individuals have strong incentives to undertake any substantial investment in the physical land, equipment, or management reorganization.

The partial effect of the adoption of the share distribution on outcomes in farm restructuring can be best illustrated by the case of Russia and Ukraine. The shift towards individual farming of land was limited (table 7). During the first decade of transition most of the land remained in use by large-scale former collective and state farms. Although as in Central Europe, former collective and state farms have taken on new names—such as joint-stock companies, limited-liability partnerships, agricultural cooperatives and collective enterprises—the restructuring was often superficial, and traditional functions and inefficient allocation of production factors continued (Lerman and Csaki 1997; David Sedik 1997). According to Lerman (1997), the main change appeared in the abolition of production plans. Because of continued dependency of farms on political authorities, however, the production plans of the local government continued to influence production behavior. In some countries, explicit intervention through the issuance of production plans continues for strategic commodities, such as cotton in Turkmenistan and Uzbekistan.<sup>17</sup>

<sup>16</sup> David O'Brien, Valeri Patsiorkovski, and Larry Dershem (2000) document important regional variations within Russia in land rights (e.g. in leasing), associated with differences in regional policies, and show how these have had important impacts on output and productivity variations among household farms in different regions.

<sup>17</sup> The important role of cotton in the economies of Uzbekistan, Turkmenistan, and Tadjikistan as a source of foreign exchange and tax revenue is essential to understanding the transition and the special nature of the reforms in the agricultural systems of these countries (Richard Pomfret 2000, 2002a,b; Max Spoor 1993).

<sup>15</sup> However, changes have been emerging in some countries in recent years. For example, Russia introduced a new land law in 2002 allowing sales of agricultural land, with some restrictions.

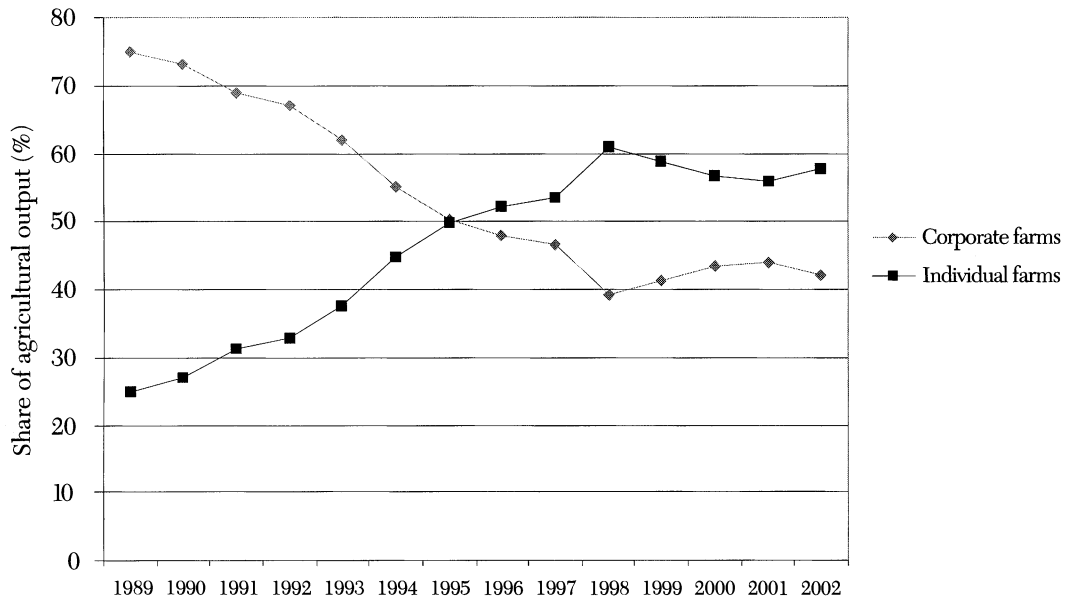


Figure 7. Agricultural Output by Farm Organization in Russia, 1989–2002 (%).  
Source: Goskomstat, various years.

Despite the pessimistic record of rights reform in CIS nations, some reports suggest that by the end of the 1990s there may have been more changes than were evident in traditional statistical sources (table 7). In many of the CIS countries the share of output from individual farms is much larger than their share in land use. This partially reflects the fact that, on average, individual farming may be more productive and that farmers typically produce a different set of more labor-intensive, high value-added commodities on their own plots. Moreover, at least in some regions, household farms, operating on their own small plots, but sometimes with some rented land, were able to make progress in adapting to new market conditions. In Russia this is especially the case in some of the more reformist regions in which regional policies allowed more experimentation with private agriculture (O'Brien et al. 2000). As in the pre-reform period, however, the higher productivity also can be explained by the symbiotic relationship that continues to exist between large-scale farms and many

individual farms. Maria Amelina (2000) shows that even in the reform era, households frequently use the large-scale farms as a way to access inputs and market their goods. Despite “help” from inputs that leaked out from the formal system, the record also clearly demonstrates that in places where reform was allowed, the improved incentives contributed to productivity growth and this in turn has encouraged greater shifts to private holdings. In Russia, for example, the share of output produced by individuals increased from 25 percent in 1989 to 60 percent in 1999 (figure 7).

In some of the slowest reforming countries, such as Turkmenistan and Uzbekistan, policy changes in the second half of the 1990s have strengthened the development of so-called intra-farm leasing (Deniz Kandiyoti 2003; Zvi Lerman and Karen Brooks 2001). Within the framework of the former collective farms, land is leased to family groups. Control rights are still limited; the leases are subject to state orders for strategic products, such as grains and cotton. In Uzbekistan, the

former collective farms provide a range of services to the farms, including access to inputs and access to water. However, these are as much used to enforce production plans and extract rents from the farms as they are to assist them (Richard Pomfret 2000, 2002b).

### 3.3 *Liberalization and the Development of Market Institutions*

In addition to property rights reform and transforming incentives, the other major task of reformers is to create more efficient institutions of exchange. Markets—whether classic competitive ones or some workable substitute—increase efficiency by facilitating transactions among agents to allow specialization and trade and by providing information through a pricing mechanism to producers and consumers about the relative scarcity of resources. But markets, in order to function efficiently, require supporting institutions to ensure competition, define and enforce property rights and contracts, ensure access to credit and finance, and provide information (McMillan 1997; World Bank 2002). These institutions were either absent in the communist countries or, if they existed, were inappropriate for a market system. For example, in most countries central-planning agencies directed production and other economic transactions, and their directives served to enforce contracts involving exchanges among various agents in the chain. Market liberalization requires the elimination of central planning, but to do so successfully requires the process to be executed in a way that will allow producers to continue to have access to inputs and marketing channels while the necessary market-supporting institutions are emerging. In this section, in order to document how transition countries have taken different paths in market liberalization, we consider three ways institutions of exchange have emerged: through the process of market liberalization; by the increased ability to enforce exchange contracts; and on the basis of how well reformers or some alternative

institutions were able to guarantee access to input and output markets during transition.

*Market Emergence in CEE and CIS: The Collapse of Exchange; Institution Rebuilding.* On the eve of transition, the agro-food systems in CEE and the CIS countries were organized much like in the West, with specialized companies at various stages of the chain, such as food processing and marketing companies (downstream firms) and fertilizer, machinery and feed producing and supply enterprises and agricultural banks (upstream firms). While there was specialization on a functional basis, the companies at various stages of the production and marketing chain operated in an environment that was centrally planned and vertically integrated (Jill Hobbs, William Kerr, and James Gaiford 1997).

The reform path taken in most of the CEE and CIS nations, although implemented with variations in speed, was predicated mostly on removing central planning and privatizing the up- and downstream companies. Reformers in the most aggressive countries began to liberalize markets at about the same time that they privatized farms, liberalized prices, and cut subsidies. Control and ownership of tens of thousands of firms shifted.

While such actions are part of the rapid market liberalization scheme, the removal of the central planning and its system of allocation and control—in the absence of new institutions to enforce contracts, distribute information, and finance intermediation—caused serious disruptions throughout the food economy (Oliver Blanchard and Michael Kremer 1997; Hamish Gow and Johan Swinnen 1998; Gérard Roland and Thierry Verdier 1999; Joseph Stiglitz 1999). One of the most serious problems for farms was access to credit for investment and working capital. With farm profitability collapsing due to the falling terms of trade, internal financial resources became limited. External finance was difficult to obtain during early transition (OECD 1998). Formal sources of credit, such as agricultural banks, were themselves facing restructuring and macroeconomic reforms.

Financial market liberalization made external credit scarce and expensive. When there was credit from formal or informal sources, it was directed towards more profitable activities, such as trading, which frequently returned high and quick profits.

Problems accessing physical inputs appear mostly in fertilizer use for crop production and feed use for livestock production. Disruptions in supply contributed to the dramatic fall in input use over the first years of transition. Fertilizer use collapsed to around 30 percent of its pre-transition level in virtually all CEE and CIS countries (table 4). Unable to buy feed, livestock operations slaughtered large fractions of their herds (Britta Bjornlund et al. 2002). The feed scarcity-induced cullings contributed to a massive decline in the animal stock during the first five years, from around 30 percent in Central Europe and the European CIS, to more than 50 percent in the Baltic countries (table 4).<sup>18</sup>

One of the clearest manifestations of the institutional disruptions in the agro food chain is the contract enforcement problems that resulted in delayed payments for product deliveries and labor. A survey of food companies in Central Europe identified payment delays as one of the most severe barriers to growth (Matthew Gorton, Allan Buckwell,

and Sofia Davidova 2000). Data from Slovakian farms show that payment delays are strongly correlated with profitability problems (1996 data from Slovak Ministry of Agriculture). A 1997 survey of Hungarian agricultural enterprises found that 61 percent of farms suffered contract breaches in the form of delayed payments and that these negatively affected profits (Cungu and Swinnen 2003). These delays, in the presence of high inflation, contributed importantly to the cash-flow problems throughout the agro-food chain and ultimately created serious financing constraints.<sup>19</sup>

Contract enforcement and non-payment problems contributed to the widespread use of barter exchange in CIS countries, such as Russia and Ukraine. For example, in the early years of the reforms estimates put the share of barter transactions at 75 to 85 percent in Russia (Laszlo Bruszt 2000). In several countries, the government was as much part of the problem as it was part of the solution, since farms used barter to avoid taxation that could occur because the government could monitor formal bank transactions. Furthermore, as the government did not impose hard budget constraints (e.g., it did not allow bankruptcy procedures to occur), farms continued their practice of not paying bills and accumulating debts in several CIS countries, including Russia, Kazakhstan, and Ukraine until the late 1990s (Csaki, Lerman, and Sotnikov 2001; Stephan Von Cramon-Taubadel, Sergiy Zorya, and Ludwig Striewe 2001).

<sup>18</sup> For example, in Russia the relative price of mixed feed more than doubled in comparison to prices of livestock products during the first years of transition and remained around that level for most of the decade (Bjornlund et al. 2002). This contributed to the decline in the animal stock to less than half of pre-transition levels. The main exceptions to this decline in livestock are Turkmenistan, Uzbekistan, and Albania. In Albania, growth in livestock resulted from a combination of an (atypical) strong increase in relative prices of livestock over grain and the shift to small-scale livestock production with the fragmentation of the collective farming system (Macours and Swinnen 2002). In Turkmenistan and Uzbekistan, growth came about because much livestock production was already in private households, and the availability of large areas of pastures in those countries (e.g. more than 90 percent of agricultural land in Turkmenistan is in pastures) allowed households to switch to less feed-intensive forms of livestock production. However also there livestock productivity and herd quality declined because of diminishing availability of mixed feed (Pomfret 2000).

<sup>19</sup> While early discussions of the finance problems focused mostly on the institutional problems, later empirical studies emphasize the profitability and cash flow problems. For example, Glenn Pederson, Karen Brooks, and Oleg Lekhtman (1998) identify the importance of profitability and cash flow problems in the perceived "excessive debt burden" of Russian farms. As Csaki et al. (2001) show, farm debt in most CIS countries increased during the 1990s because farms did not pay their obligations to government, suppliers, banks, and even workers. Another example is a 1997 Romanian survey, where farmers identify insufficient income as the key reason for their loan application being rejected (52 percent of the cases), much more than lack of collateral (18 percent) or outstanding debts (11 percent) (Junior Davis and Angela Gaburici 1999).

Finally, the absence of market-supporting institutions constrained the process of farm restructuring. Households, in weighing their prospects of farming on their own, frequently opted to stay with the collective farms, or in some of the new forms of farmer associations that had appeared, in order to retain access to inputs and to marketing outlets (Lerman et al. 2003; David O'Brien and Stephen Wegren 2002; Marian Rizov et al. 2001; Rachel Sabates-Wheeler 2002). Institutions of exchange, no matter how poorly they functioned, in many nations were still largely organized around the former structure because of the absence of reform in the up- and downstream sectors.

Furthermore, in an environment in which there are no organizations that want to deal with supplying inputs to small farms—either because the existing organizations have no incentives to do so or because new companies targeting small farmers did not emerge—political lobbying and bureaucratic connections began to play a role in facilitating change and act to discourage restructuring. In countries like Russia and Ukraine, governments discriminate openly against independent private farmers (Csaba Csaki and Allan Zuschlag 2003). For example, to obtain fertilizer Russian farms usually need the help of political authorities, such as the regional government. Farms get fertilizer at low prices in exchange for the commitment to deliver and sell their output to the authorities (William Liefert, Bruce Gardner, and Eugenia Serova 2003). Amelina (2000) documents how in many Russian regions local governments use so-called commodity credit schemes to support former collective farms, irrespective of their profitability.<sup>20</sup> These

“soft,” outside funds allow the collective farm management to continue to subsidize inputs for their employees in the form of in-kind payments. The funds also are used to provide funds that collective employees can use to buy inputs for their household plots. The system, however, discriminates against independent, individual farms as it excludes them from such credit access and from having access to the lower input prices. Moreover, the commodity credit scheme had another, equally harmful effect (Csaki et al. 2002). Because commercial credit sources cannot compete against the subsidized credit schemes, the attention of alternative sources of finance dried up for individual farmers. The result is that only a small share of the output from “individual farming” in Russia (table 7 and figure 7) comes from registered individual “private farms,” and most from so-called “household plots.”<sup>21</sup> Similarly, in countries such as Kazakhstan, most grain farms continue to depend on local authorities to supply key

<sup>20</sup> Under this “non-cash” system, input suppliers provide goods directly to farms during the sowing season, but are not paid by the farms. Rather, the debts are assumed by the government, and written off against taxes owed to the government by the input suppliers. Farms, in return, are obliged to deliver their products (often grain) to the government, often for its use in food reserves. In the fall, when (grain) prices are low, regional governments try to collect payments sometimes by imposing barriers to sales of the commodities outside the region (Csaki et al. 2002).

<sup>21</sup> In all CEE and CIS countries, rural households and farm workers had household plots under the communist system. There was a certain symbiotic relationship between the collective farm and the household plots. The small-scale farms allowed workers to add to their income by producing both for own consumption and selling some farm output. By the 1980s these household plots produced a substantial amount of output, especially for labor-intensive products such as some fruits and vegetables. Farm workers got access to cheap inputs for their household plots as they got them as in-kind compensation on the farm, or simply stole them. After 1989, in CEE the shift to individual farms was a shift to independent individual farms. While “hybrid” structures were important in some countries (e.g. in Romania), they were limited in CEE. Hence “individual farms” includes a mixture of “real” family farms and household gardens in CEE statistics. However, in countries such as Russia the development of independent individual farms was quite limited (for reasons discussed here) and household plots which were strongly linked to the large farms (in complex and informal ways) grew very strong in importance. Therefore the Russian statistics have differentiated between (individual) “private farms” and “household plots.” For example, in 1998, “household plots” used 59 percent and (individual) “private farms” 3 percent of total output. For consistency, however, we combine, for all countries, both types of farms in the category of “individual farms” in the tables and figures throughout this paper.

inputs and to finance these inputs through the issue of local authority guarantees for the provision of seed and fuel by supplies on a barter against the season's production (John Gray 2000).

Although in its initial years after transition, the food economy in much of CEE operated within a setting of incomplete input and output markets, a combination of public policy measures and private initiatives facilitated the emergence of market-supporting institutions. Those nations that implemented market liberalization reforms fastest were the first to recover (Martha de Melo et al. 1997; Charles Wyplosz 2000). Besides general institutional and macro-economic reforms, which were important prerequisites, various CEE governments have also implemented public policies targeted at reducing institutional constraints in the agro-food chain. For example, in some CEE nations, leaders began warehouse receipt and loan guarantee programs to overcome the problems faced by farmers in finding collateral for their farm loans (OECD 1999).

A number of private initiatives also have been able to overcome market imperfections and institutional constraints (Gow and Swinnen 1998, 2001). The most successful ones frequently depend on private enforcement mechanisms within the framework of specifically designed contracts or other arrangements (Simon Johnson, John McMillan, and Christopher Woodruff 1999; McMillan and Woodruff 1999). In other cases firms have turned to vertical integration. Such contracts with private agents, and other moves to vertically integrate, act as substitutes for missing or imperfect public enforcement institutions (Benjamin Klein and Kevin Murphy 1997). As a result of initiatives from both the public and private sectors, the agro-food chain's financing problems in some cases have been overcome by the actions of new and restructured food processing firms and input suppliers (Michal Pospisil 2001; Tamas Szedelyhidi 2001). For example, restructured food-processing com-

panies provide inputs to farmers and even set up programs to fund investments (Gow and Swinnen 2001). In return, producers deliver products to the firms.

The input provision program also assists farmers with gaining access to physical inputs, such as seeds, fertilizer, and pesticides. The most straightforward approach is prepayment of inputs and working capital loans. For example, processors of oilseeds and grains provide advanced payments for chemical inputs and fertilizer. Dairy-processing companies prefinance feed for farms that deliver milk to them and provide loans for milking equipment. Input supply firms in some countries also provide payment guarantees for farm input purchases. The rise of equipment-leasing services provided by machinery suppliers is another example of how an institutional innovation helped mitigate the farm's collateral problems in financing new equipment.

In CEE, firms that were taken over by foreign investors initiated many contractual innovations. For example, foreign managers of food processors typically provide technical and financial assistance to farms as part of supply contracts in order to ensure a stable and minimum quality supply of produce from their suppliers (Dries and Swinnen 2004a). Empirical evidence suggests that there are important spillovers from these contract innovations on domestic companies that quickly start imitating successful contracting and vertical integration programs introduced by foreign firms (Chris Foster 1999; Hamish Gow, Deborah Streeter, and Johan Swinnen 2000).

Currently in the countries that have most successfully created a system of market institutions, a complex of public and private and formal and informal institutions has emerged that is capable of enforcing contracts and supporting access to inputs and output markets. For example, recent surveys of farmers in Poland found that almost three-quarters used formal bank loans and trade credit from processing companies to finance investments in equipment and technology (Dries and

Swinnen 2004b). While there is a significant difference in investments and product quality of farms supplying to foreign-owned dairies compared to local dairies in 1996, this difference had all but disappeared by 2001, reflecting important convergence in standards, contracting, and management practices in the agro-food chain—a combination of private actions and public policies both imposing tougher standards and securing the emergence of market-supporting institutions.

The emergence of markets has progressed considerably slower in most CIS countries because slow policy reforms have constrained both the development of public institutions that facilitate trading as well as private institutional innovations (Csaba Csaki and Laura Tuck 2000; EBRD 2002). Since the late 1990s, however, there are signs of a turnaround in some CIS countries. For example, in Russia, after the 1998 financial crisis, important new developments have occurred in the food economy. A combination of enhanced policy credibility under the Putin government, minimal reforms, a more stable macroeconomic framework, and increased profitability of domestic food production has induced significant investments in the Russian food economy. An important share of the investments has come directly and indirectly from local financial groups. Like in CEE, investments in the food industry have affected farm performance by reducing the financial constraints that producers face through contractual arrangements (Dmitri Rylko 2002). Similarly, in Kazakhstan, recent downstream investments and contracting of grain traders with the farms have alleviated cash-flow problems and relaxed input constraints at the production level (EBRD 2002; Gray 2000). That said, much remains to be done in building market institutions in transition countries and particularly so in CIS countries.

*Market Emergence in China: A Gradual Shift from Plan to Market.* In contrast to the CEE and the CIS countries, leaders in China

did not dismantle the planned economy in the initial stages of reform in favor of liberalized markets (Rozelle 1996). Sicular (1988a,b; 1995), Perkins (1988), and Lin (1992) all discuss how China's leadership had little intention of letting the market play anything but a minor supplemental guidance role in the early reform period in the early 1980s. In fact, the major changes to agricultural commerce in the early 1980s almost exclusively centered on increasing the purchase prices of crops (Sicular 1988b; Andrew Watson 1994). The decision to raise prices, however, should *not* be considered as a move to liberalize markets, since planners in the Ministry of Commerce made the changes administratively and the price changes mostly were executed by the national network of grain procurement stations acting under the direction of the State Grain Bureau.

An examination of policies and the extent of marketing activity in the early 1980s illustrates the limited extent of changes in the marketing environment of China's food economy before 1985. It is true that reformers did allow farmers increased discretion to produce and market crops in ten planning categories, such as vegetables, fruits, and coarse grains. Moreover, by 1984, the state only claimed control over twelve commodities, including rice, wheat, maize, soybeans, peanuts, rapeseed, and several other cash crops (Sicular 1988b). However, while this may seem to represent a significant move towards liberalization, the crops that remained almost entirely under the planning authority of the government still accounted for more than 95 percent of sown area in 1984. Hence, by state policy and practice, the output and marketing of almost all sown area was still directly influenced by China's planners.

Reforms proceeded with equal caution when reducing restrictions on free-market trade. The decision to permit the reestablishment of free markets came in 1979, but only initially allowed farmers to trade vegetables and a limited number of other crops and

livestock products within the boundaries of their own county. Reformers did gradually reduce restrictions on the distance over which trade could occur from 1980 to 1984, but as Sicular (1988b) and G. William Skinner (1985) point out, the predominant marketing venue during the early 1980s was mainly local rural periodic markets. Farmers also did begin to sell their produce in urban settings, but free markets in the cities only began to appear in 1982 and 1983. In addition to these being small and infrequent, traders could not engage in the marketing of China's monopolized commodities that were still under strict control of the state procurement stations.

The record of the expansion of rural and urban markets confirms the hypothesis that market liberalization had not yet begun by the early 1980s. Although agricultural commodity markets were allowed to emerge during the 1980s, their number and size made them a small player in China's food economy. In 1984, the state procurement network still purchased more than 95 percent of marketed grain and more than 99 percent of the marketed cotton (Sicular 1995). In all of China's urban areas, there were only 2000 markets in 1980, a number that rose only to 6000 by 1984 (deBrau, Huang, and Rozelle, forthcoming). In Beijing in the early 1980s, there were only about fifty markets transacting around 1 million yuan of commerce per market per year. Each market site would have had to serve, on average, about 200,000 Beijing residents, each transacting only 5 yuan of business for the entire year. In other words, it would have been impossible for such a weak marketing infrastructure at that time to even come close to meeting the food needs of urban consumers.

After 1985, however, market liberalization began in earnest. Changes to the procurement system, further reductions in restrictions to trading of commodities, moves to commercialize the state grain-trading system, and calls for the expansion of market construction in rural and urban areas led to a

surge in market-oriented activity (Sicular 1995). For example, in 1980, there were only 241,000 private and semi-private trading enterprises registered with the State Markets Bureau; by 1990, there were more than 5.2 million (deBrau et al. 2000). Between 1980 and 1990, the per-capita volume of transactions of commerce in Beijing urban food markets rose almost 200 times. Private traders handled more than 30 percent of China's grain by 1990, and more than half of the rest was bought and sold by commercialized state grain-trading companies, many of which had begun to behave as private traders (Rozelle et al. 2000).

China moved equally slowly in its liberalization of input markets (Stone 1988; Ye and Rozelle 1994). During the pre-reform era, the state distributed all key inputs such as chemical fertilizer through the government-controlled network of agricultural input supply stations. During a time when many inputs in many regions were scarce, local officials were issued coupons that gave communes the right to purchase at least part of the inputs they needed. In the initial years of reform when decollectivization was occurring, leaders did virtually nothing to limit the role of the state in input allocation. Indeed, private sales of nitrogen fertilizer were restricted and the state continued to completely control all chemical fertilizer distribution.

Even after the start of liberalization in both output and input markets in 1985, the process was still partial and executed in a start-and-stop manner (Sicular 1995). For example, in the case of fertilizer, Ye and Rozelle (1994) show that after an early attempt at market liberalization in 1986 and 1987, perceived instability in the rural economy in 1988 led to sharp retrenchments. Agricultural officials only took controls back off fertilizer marketing and began encouraging private trade in the early 1990s. Justin Lin, Fang Cai, and Zhou Li (1996) argue that leaders were mainly afraid of the disruption that would occur if the institutions through which leaders controlled the main



goods in the food economy (such as fodder, grain, and fertilizer) were eliminated without the institutions in place to support more efficient market exchange.

However, it was only after twenty years of market liberalization that the state largely abdicated its responsibilities for grain and inputs trade. By the mid-1990s, about 50 percent of fertilizer was sold by private traders. In 2000, according to a survey of 1200 households in six provinces, fertilizer sales at the farmgate level were almost exclusively handled by the private sector. Likewise, despite the failed attempts by the government to remonopolize grain trade in the mid-1990s, by 2001, the state grain bureau commercialized its remaining grain-trading divisions, and tens of thousands of private traders dominate grain trade. For example, according to a survey by Yuping Xie (2002), in 2001 there were more than 2000 private rice wholesalers trading in Beijing, more than 3000 in Shanghai, and more than 5000 in Guangzhou. Nearly all rice moves through their hands, completely bypassing the state. Hence, China's markets have become more integrated, transaction costs have fallen, and there are increasingly fewer arbitrage opportunities left unexploited (Albert Park et al. 2002; Huang, Rozelle, and Min Chang 2003).

### 3.4 *Effects of Price, Property Rights, and Market Liberalization Reforms*

The efforts to identify the sources of output and productivity growth of the agricultural sectors in transition economies range from purely descriptive to the use of time-tested methodologies. Unfortunately, most studies tend towards the descriptive end of the spectrum. In many studies researchers at most examine output and productivity trends and compare them to trends of prices and periods of implementation of property rights and market liberalization reform policies. Such casual attribution of the cause and effect, if anything, is the rule, not the exception. In the rest of this section, we discount

this part of the literature and refer to only a small number of such descriptive studies.

A subset of studies uses more rigorous methods. In some cases, carefully carried out growth-accounting procedures control for changes in terms of trade and fixed factors and attempt to attribute the explained rise in output to policy changes (e.g., McMillan, Whalley, and Zhu 1989, for China). Others use regression-based methods that seek to isolate the sources of the changes in output and productivity. After holding physical inputs constant, some studies use primal-side models to identify the rise in output that is associated with the reform period by including a time period or continuous time variable (e.g., Pingali and Xuan 1992; and Benjamin and Brandt 2001, in Vietnam).<sup>22</sup> The parts of the rise in output associated with the institutional change (either property-rights reform, market liberalization, or both) are assumed by these studies to be the productivity effect associated with reform (or the period during which the reform policies were implemented). Other studies adopt dual-side approaches, holding prices and other factors constant, and similarly attribute the part of the output that increases over a reform period as the reform-induced change in productivity (e.g., Kurkalova and Jensen 2003). Others use both approaches (e.g., Lin 1992; Macours and Swinnen 2000a). The importance of reform is typically demonstrated in these studies by using a decomposition procedure which divides the rise in output (or the overall increase in the growth rate) to the various factors (e.g., price changes; changes in fixed factors; and reform). A smaller group of studies (e.g., Jin et al. 2002, in China) uses regression and decomposition analysis to determine the factors that explain changes over time in TFP trends. Because

<sup>22</sup> Only Lin 1992 and those who were able to use Lin's data were able to create a measure of reform that was more finely graded than a time trend. Lin was able to create a variable that measured the number of villages in each year that had adopted decollectivization reforms.

leaders in China and Vietnam launched their reforms earlier, the most comprehensive studies tend to be those studying East Asia.

Despite attempts to carefully match periods of reform to regression-based analyses, the results of most studies need to be carefully interpreted, because the use of time trends and time dummies by definition captures all systematic change that is unexplained by the other regressors included in the equation. The implicit assumption of most analysts almost always seems to be that nothing else was changing during the time. In almost all cases, however, it is likely that the failure to capture other factors, such as traditional technological change in cropping and livestock operations, means that the estimates of the impacts of reforms may be biased. Finally, although interactions among the different components of reforms (e.g., price reforms are likely to matter more if property-rights reforms have given producers greater incentives) are almost certainly important, little attention is given to them.

*Effects of Price Shifts and Subsidy Changes.* Several studies show that price changes had an important influence on the performance of the agricultural sector and in part help explain observed trends in output. Using simple measures of correlations, Macours and Swinnen (2002a) find a positive relationship (the correlation coefficient is 0.70) between changes in output and changes in relative prices across fifteen countries during the first five years of transition. Although only being used to motivate the changes, they show that output increases only in those countries in which terms of trade increased (e.g., China, Vietnam, Albania). Empirical studies using multivariate analysis on China confirm a strong impact of these price changes on output during the first years of transition (Lin 1992; Fan 1991; Huang and Rozelle 1996; Shenggen Fan and Phil Pardey 1997). Lin (1992), for example, finds that 15 percent of output growth during the first six years of reform came from the rise in relative prices.

Huang and Rozelle's (1996) decomposition exercise for rice demonstrates that about 10 percent of the output between 1978 and 1984 came from the price effects.<sup>23</sup> In contrast, the multivariate estimates of Macours and Swinnen (2000a) show that around 50 percent of the initial decline in crop output in eight CEE and Balkan countries was due to deteriorating terms of trade.

*Effects of Property Rights Reforms.* While the speed and nature of rights reform and restructuring have varied greatly across the reforming world, in those places that have carried out decollectivization, land restitutions, control-rights transfers, and farm reorganization, a robust positive effect appears on output in some areas, and productivity has risen in all of the areas that carried out these multidimensioned reforms. In East Asia, the changes in incentives that resulted from the property-rights reforms and farm restructuring triggered strong growth in both output and productivity. In the earliest study of the reforms, McMillan, Whalley, and Zhu (1989) document that the early reforms in China sharply raised productivity, accounting for 90 percent of the rise of output (23 percent) between 1978 and 1984. While the strong positive link between the reforms and output has been confirmed by many other studies, the shortcomings of attributing all of the productivity rise to the reform movement generally is shown by subsequent studies. In the most definitive study on the subject, Lin (1992) estimates that China's HRS accounted for 42 to 46 percent of the total rise in output during the early reform period (1978 to 1984). The lower effect due to property rights reform undoubtedly is due in part to the fact that Lin's estimates held other

<sup>23</sup> It is more difficult to measure the effect of price changes on productivity, since as in McMillan, Whalley, and Zhu (1989) and Jin et al. (2002), the price effects are removed before explaining TFP changes. In Justin Lin (1992) and Huang and Rozelle (1996), however, there is evidence that higher prices are associated with higher rates of technology adoption, which has contributed positively to the rise in TFP during the reform era. Hence, price changes may have an indirect effect on TFP.

reform measures constant—e.g., pricing-policy changes (accounting for 10 percent) and nascent market-liberalization policy shifts (accounting for less than five percent). In addition to including independent measures of specific reform policies, the main strengths of Lin's study are that he uses both primal- and dual-side models and his measure of decollectivization is a continuous variable.

Subsequent studies of China's growth, however, showed how even Lin's seminal work both over- and underestimated the impact of the early reforms on agriculture. The reform effect falls to only about 30 percent in both Fan (1991), which used a primal-side approach, and Huang and Rozelle (1996), which mainly used a dual-side approach. The fall in the return to decollectivization is explicitly shown in Huang and Rozelle (who use Lin's measure of the shift of the HRS as well as controlling for prices and most of the other factors that Lin controlled for) to be due to the inclusion of variables that hold constant technological change. In contrast, a number of researchers have suggested that the effect of the reforms exceeded the direct impact on the agricultural sector. Rises in surplus in the agricultural sector created by HRS triggered a number of subsequent growth dynamics, providing labor for rural industry's take-off in the mid-1980s (Ronald McKinnon 1993), fuelling the nation's overall industrialization drive later in the reforms (Kang Chen, Gary Jefferson, and Inderjit Singh 1992), and creating demand for the products of firms in other parts of the economy (Yingyi Qian and Chenggen Xu 1998).

Similarly, the Vietnamese Doi Moi reform induced strong growth in both output and productivity. Rice production, the nation's primary crop, grew on an annual basis at the rate of 3.14 percent between 1982 and 1987, up from less than 0.5 percent between 1976 and 1981 (Pingali and Xuan 1992). Econometric analysis showed that productivity-led growth boosted output by around 15 percent during the early post-reform period.

Noting that both technological change and market liberalization in Vietnam's agricultural sector were virtually absent during the early 1980s, Pingali and Xuan assert that almost all of the growth should be attributed to the property-rights reforms.

In the CEE and the CIS countries in which effective reforms had been implemented, privatization of farming generally has produced two different effects on output, although one must be careful in attributing causality due to the complex links between rights reform, restructuring and output and the interactions with the other reforms that are occurring in many countries. For example, the hard budget constraints imposed on producers by reformers reduced subsidies and led to falling inputs and output. On the other hand, greater incentives increased effort, raised technical efficiency, and increased output. Calculations based on the multivariate analysis of Macours and Swinnen (2000a), which also holds constant the effect of prices, indicate that in CEE the reduced subsidy effect dominated in early transition. The negative output effect due to reductions in input (a -70 percent fall) was mitigated, but not fully offset, by the increase in output from gains in technical efficiency (a 45-percent rise). The net effect was negative (-25 percent) and explains around a quarter of the total output fall in CEE agriculture in early transition.

In countries where rights reforms and farm restructuring did not improve productivity, however, the negative output effect of the decline in input use was reinforced by a fall in efficiency. Estimates by Lyubov Kurkalova and Alicia Carriquiry (2002) and Kurkalova and Jensen (2003) indicate that in Ukraine falling input use and declining efficiency reinforce each other during early transition. Both studies estimate company-level (or corporate farm-level) efficiency using stochastic production frontier analysis. They then go on to explain differences in inefficiency levels over time as a function of price changes, input adjustments, and year effects.

Although somewhat ad hoc (in that they use relative prices to explain technical efficiency differences among companies), their results are persuasive in showing that the decline in the use of inputs accounts for about half of the total output decline in collective farms. They also blame a decline in technical efficiency (of 15 percent) between 1989 and 1992 to be due to general reform matters.<sup>24</sup>

Total factor productivity estimates on the FSU countries between 1992 and 1997 by Lerman et al. (2003) also are consistent with the significant impact of rights reforms and restructuring on productivity. Their analysis indicates strong productivity growth in Baltic countries in which reforms were implemented most strongly. Total factor productivity also increased strongly in Armenia and Georgia, two Transcaucasian countries that implemented strong individualized land rights and dramatically shifted to individual farming even though the nations were recovering from a series of natural disasters and war-related incidents. In contrast, TFP declined in the Central Asian republics in which reforms lagged most. While the most comprehensive study of productivity in the CIS nations, their link between the rise in TFP and reform should be interpreted cautiously. Using one observation per state per year, the authors estimate a production function and implicitly assume that the unexplained change in the output over time (or productivity change) was due to transition policies. Unfortunately, a paucity of data makes it impossible for Lerman and his coauthors to create a model explaining TFP, an approach that would enable them to identify more precisely the exact causes of the changes in productivity.

The importance of distinguishing between ownership types in studies that are searching to link reforms with productivity is perhaps best illustrated in the cases of Russia and

Ukraine.<sup>25</sup> Whatever growth occurred during the first decade of transition in Russia and Ukraine seems to have occurred on household plot production, the only place where rights were effectively in private use. Johnson et al. (1994), Kurkalova and Carriquiry (2002), Sotnikov (1998), and Sedik, Trueblood, and Arnade (1999) find declining productivity on corporate farms in Russia and Ukraine. Michael Trueblood and Stefan Osborne (2001) discover that productivity on corporate farms declined by 2.1 percent annually after 1993 and continued to decline until 1998. Their analysis does not find any indication of a productivity rebound in Russia in the late 1990s. Interestingly, all studies that find a negative effect of rights reforms on TFP exclude household farming. In contrast, Lerman et al. (2003), who include both corporate and household farming in their analysis, find that productivity in Russian agriculture increased by 1.4 percent annually between 1992 and 1997. Similarly in Ukraine, Lerman et al. (2003) and Olga Murova, Michael Trueblood, and Keith Coble (2001) find that TFP in production improved slightly during transition when they include both corporate and household farms in their analyses. Their results suggest that the positive effects come mostly from the shift to household farming.<sup>26</sup>

<sup>25</sup> The importance of accounting differences in the ownership status of plots (especially in distinguishing between private/collective plots) is less important for the cases of East Asia and CEE. In China and Vietnam, farm households had small private plots—about 5 percent of total cultivated area—both before and after reform (Loren Brandt, Guo Li, and Scott Rozelle forthcoming). But, except for some villages that allocated more land in the form of private plots to households at the beginning of the reforms, by far a vast majority of households saw no difference regarding private plots with the onset of reform. Moreover, all studies of the effect of the reforms on farm output and productivity include both private and collectively owned plots. The work in CEE by Macours and Swinnen (2000a) also includes all types of plots. Moreover, although there was a clear distinction in the pre-reform era, after reform the importance of private plots diminished markedly.

<sup>26</sup> The study indicates that labor measured in hours employed contracts significantly stronger than “agricultural employment,” suggesting significant underemployment remaining on the large farms.

<sup>24</sup> Kurkalova and Carriquiry (2002) attribute the rest of the decline (–35 percent) to weather effects. Weather effects caused 10-percent output decline in the Macours and Swinnen (2000a) study.

Looking inside transition regions in CEE and the CIS nations, like in the case of East Asia, illustrates a link between technology, policy, and performance. Although gains in productivity have come from both rights reforms and organizational restructuring, the relative importance of each component differs between countries reflecting technology and policy differences (Macours and Swinnen 2002). In countries with labor-intensive technologies, the shift from large-scale collective farming to small-scale individual farming caused dramatic gains in technical efficiency with relatively small losses in scale efficiency.<sup>27</sup> In such countries, including China, Vietnam, Albania, Armenia, Georgia, and Romania, the gains in productivity came mostly from the shift to household farming when land was distributed to rural households (table 7). In all these countries the man/land ratio was over 0.2 persons per hectare, and TFP increased strongly during early transition (between 4 percent and 9 percent annually) when individual farming grew from 8 percent of total land use on average to 84 percent on average.<sup>28</sup>

In contrast, in the Czech Republic, Slovakia, and Hungary, countries in which farming was more capital intensive (man/land ratio of 0.14 or less), gains in labor productivity came primarily from large farms shedding labor with privatization of the farms.<sup>29</sup> During the first five years of transition, labor use declined by 44 percent

on average in these three countries, yielding an annual increase in labor productivity of 7.5 percent on average, while individual farms used only 15 percent of the land.<sup>30</sup>

*Effects of Market Liberalization.* Few authors have attempted to quantify the gains from market liberalization. Part of the problem may be the short period of analysis, the inability of standard methodologies and measures or indicators of market liberalization to separate efficiency gains of market reform from overall gains in the reforming economy, and the breadth of the studies. For China, Wen (1993) found TFP growth had stopped in the post-1985 period, a trend he blames on the failure of the market-liberalization stage of reform. There are two shortcomings of Wen's conclusions. First, his analysis ends in 1990, a period that might be too early to have allowed the liberalization reforms to take effect. Second, he is only examining the net change in TFP and does not account for other factors that could be affecting productivity. Holding the effect of technology constant and using data through 1995, Jin et al. (2002) find that TFP growth restarts in the 1990s, a finding that they claim could be linked to increased liberalization of the economy. Like Wen, however, they do not explicitly examine the improvements in efficiency that are associated with market development. Fan (1999) uses stochastic frontier production decomposition analysis to isolate the efficiency gains of Jiangsu provincial rice producers in the late reform era, a time when most of the property rights reforms had already been implemented and when market liberalization was just getting started. Fan finds that there were only limited gains in allocative efficiency after 1984, a result that he suggests is due to the partial nature of China's market liberalization. Unfortunately, Fan does not explicitly model the interactions between

<sup>27</sup> An important factor in the optimal scale of farming is, besides scale economies in some technologies, transaction costs in labor management. Large operations in agriculture face transactions costs because of principal-agent problems and monitoring costs in labor contracting, which are typically large in agriculture (Gunter Schmitt 1991; Robert Pollak 1985), although the importance varies with specialization and technology (Douglas Allen and Dean Lueck 1998).

<sup>28</sup> In Azerbaijan this productivity effect is not captured in the data in tables 2–5 because the land distribution and farm individualization process only started in 1996. Average yields increased by 13 percent annually between 1997 and 2002 (Republic of Azerbaijan 2003).

<sup>29</sup> On average, the man/land ratio was more than five times higher in East Asia than in Central Europe or Russia (table 8).

<sup>30</sup> In contrast, agricultural labor use increased in many of the transition countries where individual farming grew strongly.

TABLE 8  
Selected Initial Condition Indicators for Immediate Pre-Reform Period in Transition Countries.<sup>a</sup>

		Share of agr. in employment %	GNP/ capita PPP \$ 1989	Labor/ land persons/he	Agr. land in ind. farms %	CMEA export % of GDP	Years central planning
East Asia	China	69.8	800	0.672	5-10	0.01	42
	Viet Nam	70.2	1100	2.298	5	0.05	21
	Laos	n.a.	n.a.	n.a.	54	n.a.	16
	Myanmar	66.2	n.a.	0.970	99 <sup>b</sup>	n.a.	38
Central Asia	Mongolia	32.7	2100	0.002	0	0.17	n.a.
	Kazakhstan	22.6	5130	0.008	0	0.18	71
	Kyrgyzstan	32.6	3180	0.054	4	0.21	71
	Tajikistan	43.0	3010	0.185	4	0.22	71
	Turkmenistan	41.8	4230	0.015	2	0.34	71
	Uzbekistan	39.2	2740	0.109	5	0.24	71
Transcaucasus	Armenia	17.4	5530	0.218	7	0.21	71
	Azerbaijan	30.7	4620	0.203	2	0.33	70
	Georgia	25.2	5590	0.217	12	0.19	70
European CIS	Belarus	19.1	7010	0.105	7	0.45	72
	Moldova	32.5	4670	0.269	7	0.25	51
	Russia	12.9	7720	0.044	2	0.13	74
	Ukraine	19.5	5680	0.118	6	0.25	74
Baltics	Estonia	12.0	8900	0.072	4	0.27	51
	Latvia	15.5	8590	0.085	4	0.31	51
	Lithuania	18.6	6430	0.098	9	0.34	51
Central Europe	Czech Rep	9.9	8600	0.122	1	0.10	42
	Hungary	17.9	6810	0.131	13	0.10	42
	Poland	26.4	5150	0.258	76	0.17	41
	Slovakia	12.2	7600	0.139	2	0.10	42
Balkans	Albania	49.4	1400	0.627	3	0.02	47
	Bulgaria	18.1	5000	0.132	14	0.15	43
	Romania	28.2	3470	0.204	14	0.03	42
	Slovenia	11.8	9200	0.116	83	0.07	46

<sup>a</sup> Pre-reform indicators are from 1978 for China, 1981 for Viet Nam, 1986 for Laos, 1989 for the CEECs and Myanmar, and 1990 for the FSU and Mongolia.

<sup>b</sup> Own estimation.

Source: Macours and Swinnen (2002).

property-rights reform and market liberalization. Also, his study examines only one crop in one province, a fact that limits the generalization of his study, since it is possible that many of the gains from market liberalization come from shifting among crops (and between cropping and non-cropping activities).

The only truly systematic attempts at trying to measure the returns to market liberalization in China are deBrauw et al. (2000;

forthcoming). These papers develop measures of increased responsiveness and flexibility within a dynamic adjustment cost framework (as developed by Larry Epstein 1981) to estimate the return to market-liberalization reforms, holding the incentive reforms and other factors constant. The authors find that the behavior of producers in China has been affected by market liberalization, but that the gains have been relatively small. Small gains in responsiveness

(that are measured by price elasticities of factor demand for variable inputs—in this case, fertilizer) between the early and late reform periods are attributed to the gradual market-liberalizing changes of the late 1980s. Farmers also have increased their speed of adjustment of quasi-fixed factors (which in the case of China's agriculture includes labor and sown area) to price changes (and other shifts in exogenous factors) between the early and late reform periods. The magnitude of the gains in efficiency from increased responsiveness and flexibility in the late reform period, however, is substantially less in percentage terms (less than 1 percent *per year*) than that from the incentive reforms in the early reform period (up to 7 percent per year or about 40 percent over the whole period). But, although the gains are small, they are still positive, and China's gradual market reform policy appears to have avoided the collapse that was experienced throughout CEE and CIS nations. Unfortunately, the results of the deBrauw paper cannot study the interactions among property-rights reform and market liberalization since it relies on the assumption that the time period of the reform identifies the effect of individual policies (that is, all of the property-rights reforms were completed before 1984 and market liberalization did not begin until after 1985). The results also only examine the effect of market liberalization.

In contrast to the research in China that demonstrates the success of the gradual market-liberalization measures, scholars have differing views outside of Asia. Without much quantitative support, several authors have pointed to the negative impact of the early market policies on output and productivity in CEE and the CIS nations (Roland 2000; Peter Wehrheim et al. 1998). Other studies explain how the emergence of market-supporting institutions has been crucial in the agricultural recovery and growth and improved access to input and output markets in several CEE countries, and that their

absence hampered recovery in other, mainly CIS, transition countries (EBRD 2002; Swinnen 2002; World Bank 2002).

Unfortunately, the only studies that try to quantitatively examine market-liberalization effects use rough time-period indicator variables. These studies provide some support for a J-shaped impact of radical market liberalization. For example, Macours and Swinnen (2000a), after holding constant property-rights reform, farm restructuring, and other factors, measure the impact of the breakdown of exchange systems between farms and input suppliers and processing companies with a time-period dummy variable for the first two years after major restructuring. They find that the breakdown of exchange has a negative effect on output and productivity in CEE. Evidence on subsequent recovery with the emergence of new institutions for contract enforcement in CEE is limited, but growing.

Although there has not been any transnational, systematic study of the impact of market liberalization, there have been a growing number of papers on single industries and small groups of firms in transition nations (Silke Boger 2001; Gow and Swinnen 2001). These studies, often case study in nature, find strong positive effects on firm performance of the emergence of institutions that help in contract enforcement and the provision of credit and other inputs. For example, Gow, Streeter, and Swinnen (2001) for sugar, and Dries and Swinnen (2004a,b) for dairy, document how enterprises have used contracting to help producers gain access to inputs and sell their output in the absence of well-functioning wholesale markets.

Despite the appearance of these case studies, most of which tell a similar story, there still is relatively little systematic, econometric-based evidence of these dynamic market-liberalization effects. Macours and Swinnen (2002), using a rough measure of the overall liberalization of the economy developed by de Melo and Gelb (1996), find that over the first five years of the reforms, in their regression results

explaining agricultural productivity in fifteen transition countries, the coefficient on the indicator of market liberalization was significantly positive. This positive correlation between the emergence of markets and productivity was found even after holding constant property rights reforms, farm restructuring, and prices. This conclusion is consistent with findings of Swinnen and Vranken (2004), who calculate farm-level efficiency indicators based on representative surveys in five CEE countries and show that, after the initial transition period, the average farm efficiency in the five countries is strongly positively correlated with the level of economic reforms and market liberalization as measured by EBRD and World Bank indicators.

In summary, the transition countries have taken vastly different roads in market liberalization. The empirical evidence suggests that there is no single successful path in establishing a market economy. In several CEE countries, a rapid and radical approach to full-scale market liberalization of the entire agro-food system contributed importantly to output declines in early transition, but within five years after the start of transition, market institutions were emerging, and after a decade, robust productivity growth.

In contrast, the success of China's liberalization policies is due to an entirely different, much more gradual approach that ultimately contributed to positive productivity growth, while avoiding catastrophic disruption. In the short run, planning with all of its inefficiencies was retained for the nation's major agricultural commodities. Even though the maintenance of the system of planned procurement and supply in China almost certainly caused substantial allocative irrationalities during the interim (although these have never been measured), the benefit of such a strategy was that it did provide farmers access to inputs and product outlets during the period of property-rights reforms and farm restructuring and avoided the economic collapse experienced

outside of Asia (Rozelle 1996). With improved farm productivity (initially from other policies, such as HRS), the planning system actually increased farm incomes and allowed an increasing supply of food to urban consumers. In the longer run, China's market liberalization strategy depended on creating an environment that allowed new entrants. The gradual policies at the very least allowed space for traders to slowly develop networks and figure out ways to finance commodity trade (Watson 1994). In the longer run, as these traders began to take advantage of profitable trades, they attracted new traders and forced the state to commercialize the trading divisions of the grain bureaus in a way that is described more generally by McMillan and Naughton (1992). Ultimately, this competition forced policy makers to formally remove most of its market-restricting policies, mainly because they were not effective. The gradual deregulation of the input and output marketing also ultimately produced its own successes.

*Interactions Among Reform Policies.* Discussions of optimal sequencing and precise measurement of returns to reform policy depend heavily on the ability to identify and disentangle interaction effects that may occur when leaders implement more than one policy during a single time period, and almost no empirical work has addressed the challenge. The biggest problem is certainly data. Lack of long-enough time series with explicit measures of the reform policies makes the task almost impossible in most countries. Although most studies that use time dummies to identify reform impacts point out the multiple effects that are occurring simultaneously as well as working together, nothing more is (or can be) done with most studies.

The only two studies that have generated any formal empirical measure of the magnitude of the interaction effects are Lin (1991) and Huang and Rozelle (1996). In these two works, although the authors try to isolate the behavioral effects of the HRS first-stage



reforms from the effects of market liberalization, they show that in reality the two are quite related. Their analyses show that China's agricultural sector has experienced both positive and negative interactions between market improvements and improved incentives. For example, own-price output elasticities of farm producers rise after HRS, but the total output shows a secular drop due to the demise of some centrally planned policy functions that free-market agents do not take over. In other words, the papers show that increased responsiveness is conditional on having good incentives and relatively full decision-making authority. Moreover, the authors realize that given these interactions, when using time-period indicator variables to capture the returns to a specific reform, the results will be biased.

Despite the lack of rigorous empirical evidence, our understanding of transition economies suggests that interactions are important. If state government procurement and sales channels have collapsed and market liberalization has not created new ways for producers to purchase inputs or sell output, it is almost certain that the effectiveness of improved incentives from property-rights reforms would be attenuated. Likewise, market liberalization without improved incentives will likely both slow down the emergence of markets (there will be little supply or demand for the newly marketed goods and services) and reduce the impact on output and productivity growth. As a result of these strong and important interaction effects, it is likely that studies that use time-period indicators to measure effects of reforms on outcomes will be over-attributing the effects to a single policy if there is more than one reform being undertaken by reformers.

#### *4. Summary*

In this paper our primary goal is to understand the linkages between the shifts in pricing and subsidy policies, property-rights

reform and farm restructuring, and market liberalization and economic performance. Although striking differences have appeared in the nature of the reforms and their effects across the transition world, several strong empirical regularities linking reform strategies to performance have emerged. First, pricing policy and shifts in relative prices between the pre-reform and post-reform eras have played an important role in output changes. Price and subsidy policies, however, more than any other factor, explain why agriculture in East Asian transition economies grew in the immediate post-reform years and why it did not in CEE and the CIS nations. Virtually all reformers sought to bring their pricing structure more in line with international prices so they would better reflect the relative scarcities of resources and consumer demands. In the process of eliminating the distortions, however, relative prices moved in one direction in East Asia and the opposite elsewhere. During the planning era, China and Vietnam had tried to force industrialization in part by taxing agriculture with low prices in order to keep wages of industrial workers low. Their counterparts in most of CEE and the CIS nations, in contrast, had tried to stimulate food production by subsidizing inputs and providing high bonuses for marketed surplus. Hence, in the rationalization of prices, reformers in East Asia raised the prices of output, which strengthened the output-to-input price ratio. At the same time, their counterparts outside East Asia eliminated planning and many or all of the input subsidies and output premiums, which led to plummeting output-to-input price ratios. Since producers in all transition economies responded to price changes similarly (increasing output as output prices rose and decreasing output as input prices rose, and vice versa), the direction of the price changes after reform helps explain why East Asia's output moved up in the initial post-reform era and those of CEE and the CIS nations trended down.

Beyond changes in relative prices, market-liberalization policies reinforced the shifts caused by relative price changes and also help explain the sharp collapse in CEE and the CIS nations during early transition. When reformers took control, they typically outright shut down the planning ministries in most CEE countries and curtailed their power in CIS countries. As a result, in most countries the systems through which the pre-reform producers had purchased their inputs and sold their output disappeared. Hence, it is easy to understand why production and productivity fell so dramatically in the first year or two after reform. In retrospect such a fall should have been expected, since it is hard to conceive how completely new institutions of exchange could emerge in a matter of months. Perhaps more surprising is the speed in which institutions of exchange reemerged in a number of CEE nations. Although deep markets characterized by the meeting of numerous buyers and sellers still had not materialized after several years of reform, the CEE experience shows how alternative institutions appeared to facilitate exchange. In those countries in which the institutions emerged, output and productivity began to recover by the mid-1990s and productivity growth has continued since. In those countries in which such institutions did not emerge, productivity continued to lag.

In East Asia reformers moved more gradually, and in the initial years made almost no changes to the state-dominated marketing channels that were set up during the planning era. So while market liberalization did not play much of a role in pushing up output and productivity of East Asian producers in the initial years after reform, it did not hold it back. In the longer run, however, policies in East Asia facilitated the entry of thousands of private traders, and the gradual rise of markets in the post-reform era has been linked with positive, albeit small, productivity increases.

Perhaps more than any other policy shifts, property-rights reform and the farm

restructuring that it facilitated are responsible for the rise of productivity in transition countries. This certainly was true in East Asia. For several Central European countries empirical studies almost all identify the positive links between property-rights reform and productivity. But while the effects of land reform have been both positive and strong, the mechanisms that led to enhanced performance in East Asia and Central Europe have been quite different. In East Asia income and control rights were given to producers, creating millions of new family-run farms. Land ownership remained with the state and privatization of land is still being debated today. The partial reforms, however, appear to have provided enough incentives and improved decision-making capacity to have ignited the rapid rise in output and productivity in Asia.

In contrast, privatization through restitution characterizes the main way that Central European reformers implemented reforms. The reforms themselves, however, were not enough, since many of the new landowners had long since moved to the cities. Instead, the emergence of land-leasing contracts allowed the growth of individual farms and the survival of large corporate farms (albeit with less labor, which was systematically laid off by large reorganized farms in the most advanced Central European economies) (Vranken and Swinnen 2004). These institutional innovations have been essential ingredients of the rise in productivity in Central Europe.

While the picture in the literature on the CIS nations was fairly bleak in terms of property-rights reform-induced productivity rises, it may be that the CIS nations are finally being affected by the reforms. During the early years after reform, the lack of clear rights that linked income to effort and the inability to provide farmers a way to restructure their farms held back any rights-generated output or productivity rises. Recent empirical work in Russia, Ukraine, and Kazakhstan (mostly on economic performance in the second decade of reform) finally may

be showing that improvements in property rights and farm restructuring are affecting productivity. If so, it may be that the main difference between CEE and the CIS nations is the nature of the lag between reform and a turnaround in output and productivity.

#### 4.1 *Lessons and Generalizations*

In this section, we examine three sets of lessons. First, we briefly discuss the importance of choosing the right indicator for measuring performance. Second, we examine the similarities and differences in how countries have chosen different reform strategies. Finally, we make observations on how reform packages have been put together and how some combinations have been more successful than others.

*Getting the Measure of Success Right.* The first, and perhaps most basic, lesson is that we should be careful about which indicator we use to measure transition performance. If we use an indicator of efficiency or productivity instead of output, it is less clear that agricultural transition in CEE—especially that in Central Europe—was less successful than that in China and Vietnam. If prices need to reflect long-run scarcity values of outputs and inputs, then efficiency required that leaders raised agricultural prices in East Asia, a move that naturally would lead to higher output. Likewise, when subsidies were removed, rational producers should use less inputs, actions which, as seen by the record in CEE and the CIS where the ratio of output-to-input prices fell sharply, led to falling output in these countries. In short, although leaders in many countries count increases in output as success, productivity shifts, not production trends, should be the primary metric for measuring success in transition agriculture.

*Getting the Institutional Framework Right.* Assuming success is measured correctly, comparing the property rights and organizational reform processes across the transition world also yields several lessons about the determinants of reform success. First, the lesson regarding property-rights

reforms is nuanced. Good rights and the incentives they created certainly contributed to and will continue to affect performance positively. Poor ones undoubtedly account, in part, for the poor performance of some agricultural systems. This is well-illustrated by the difference between China and Central Europe on the one hand and Russia, Ukraine, and Central Asia on the other hand. Despite being incomplete, East Asia's reforms allocated relatively strong property rights to individual land plots. In Central Europe, land was either restituted to former owners or distributed to farm workers in delineated boundaries and leased to new farms. Although the land reforms in these countries were complex and difficult to implement, they ended up with stronger and better-defined property rights for the new landowners than in Russia, Ukraine, and many other CIS countries. In the CIS countries, in contrast, land was distributed as paper shares to workers of the collectives and state farms. Individuals could not identify the piece of land that belonged to any given share, causing weak land rights for individuals and undermining their ability to withdraw land from the large farms and establish private farms. As a result, family farming emerged only slowly and large farms have had fewer incentives to restructure. The empirical evidence in the literature, although fragmented, mostly supports these observations.

Despite the strong relationship between rights reform and performance, another important lesson is that full privatization of land is not needed to induce efficiency gains. In many countries the introduction of private ownership and sale of agricultural land encountered strong social and political opposition and kept reformers from providing a complete complement of rights to producers. For example, the top leadership in both China and Vietnam did not allow private ownership of agricultural land. Today, in China and Vietnam, farmers still cannot buy or sell land. The strong positive effect of

rights reform and restructuring on output and productivity demonstrates that allocating clear and well-identified land use and income rights can by themselves enhance efficiency, investment, and growth. In contrast, as seen from the cases of many CIS nations, if rights are too weak, there is little effect on performance.

Despite such progress, we do not want to suggest that a decade of agricultural transition has created a system of full and unencumbered property rights even in the best-performing countries; in fact, many major constraints remain. For example, China's leaders are still struggling to figure out a way to provide more secure tenure rights for farmers. Most pervasive, local leaders in many regions of the country continue to periodically expropriate land, shifting it among farmers for a variety of reasons (Brandt et al. forthcoming). Although the impact on the investment in land and other long-term farming assets is typically found to be relatively minor (Hanan Jacoby, Li, and Rozelle 2003), poor land tenure may be undermining the emergence of rental markets, keeping farm size from increasing, and precluding farmers from using land as an asset for collateral, which could be constraining investment in nonfarm activities (Benjamin and Brandt 1999). In CEE, observers of land reform are worried about excessive land fragmentation (e.g., in the Balkan countries) and monopolistic control of large corporate farms in an emerging land market (e.g., in Slovakia).

Second, the lessons regarding the impact of farm restructuring also are nuanced. To start, it should be noted that except in labor-intensive agricultural economies, the individualization of farming should not be counted as an indicator of successful transition. Individualization frequently has been accompanied by a dramatic reduction in farm size, and in some cases, falling farm size leads to a loss of scale efficiencies. Smaller farmers in most CEE and CIS nations also experienced a sharp fall in their access to capital that was available for use in production (OECD 1999). While moves to

small farms may make sense in some labor-abundant agricultural economies in the short run, in the longer run the transition to a modern state means that farm size must be sufficiently large and the intensity of capital use should remain fairly high.

We can see how natural-resource availability and initial technology, which vary tremendously across the transition world, have played an important role in affecting the impact of farm restructuring (Johan Swinnen and Ayo Heinegg 2002). For example, technology played a decisive role in the success of the break-up of collective farms. With labor-intensive technology, the cost of breaking up large collective farms in terms of losses of scale economies is smaller, and the gain from improved labor incentives from the shift to family farms is larger. As a result, since farms in China and Vietnam are much more labor-intensive than the typical farm in the rest of the transition world, the reforms that provided farmers in East Asian nations with incentives and individualized their farms were able to create relatively large shifts up in productivity.

In contrast, many regions outside of East Asia were characterized by an entirely different farm technology, which greatly affected the impact of farm restructuring. Large parts of Russia, Ukraine, and Central Asia are land abundant. Many of the richer parts of CEE also have much less labor-intensive production systems. The returns to breaking up the large-scale farms into individual farms in many of these countries necessarily are lower than the gains experienced in East Asia.

Strong benefits from farm individualization, however, were not completely absent from CEE and the CIS nations. In fact, several countries have gained, although the benefits were only enjoyed by the CEE and CIS countries with relatively high man/land ratios. The nations that benefited from farm individualization were those in the poor areas of the Balkan and Transcaucasian regions. Specifically, the four countries (Albania, Azerbaijan, Armenia, and Georgia) which have man/land ratios above 0.2 persons per

hectare (ratios that are similar to those of East Asia) are the nations that have experienced the highest growth rates of TFP after land was distributed to households and large-scale individualization of farms followed.<sup>31</sup> Such high rates of productivity gain are similar to those experienced in Asia during the first reform years.

Even without individualization, corporate-farm restructuring can lead to strong rises of productivity in transition agriculture. One of the main differences between Russia and Ukraine, where productivity fell, and some of the European countries such as Hungary and the Czech Republic, where productivity increased, is not so much the scale of the farm operations, but rather the degree to which their management was restructured (Lerman, Csaki, and Feder 2004). In Central Europe, farm enterprise budgets were hardened, and on-farm decision making became independent. Farm managers became primarily concerned with turning a profit, and their increased managerial efforts induced sharp shifts in input use, management reforms, and efficiency increases. In contrast, large-farm restructuring in Russia and in several other CIS countries was far less profound. For example, Csaki et al. (2002) argue that even in 2001 Russian large-farm decision making still had important features similar to those of the traditional collective-farm structures. Farm leaders are still committed to providing all members with jobs, regardless of the cost-efficiency considerations. Farms also are obliged by tradition and sometimes by government pressure to maintain the social infrastructure of the village. In many cases, because of these other obligations, farms put little emphasis on profits.

The continuation of many of these anachronistic practices is almost certainly linked to failure of restructuring. Above all,

many nations failed to eliminate soft budget constraints and the government continued to tolerate nonpayment of farm debts. Similarly, in some countries, such as Kazakhstan, "initial attempts at reform, which saw the state and collective farms converted first into collective farm entities and subsequently into producer cooperatives, involved little real change in patterns of ownership management and control because up to 1998 the former state and collective farms were never subjected to a hard budget constraint. ... without the sanction of the threat of bankruptcy there was little incentive for farm managers either to reduce their indebtedness or to reform their internal governance" (Gray 2000, p. 1). In addition, other researchers, such as Zorya (2003), argue that until 2000 the structure and behavior of the large-scale farming enterprises in Ukraine did not differ significantly from the structure of Soviet agriculture, primarily because of the continuation of soft budget constraints and major constraints on individuals leaving the farms and enforcing their land rights.

Interestingly, in several transition countries, "hybrid" farm organizations have emerged that seem to address the need for institutions that allow both better incentives and labor governance and create organizations that can capture scale economies. For example, Sabates-Wheeler (2002) finds that in Romania the most efficient farm organization for resource-constrained small farmers are "family societies" in which farmers collectively share in the provision of mechanized services. Mathijs and Swinnen (2001) find that "partnerships," small groups of farmers in East Germany that pooled their efforts in certain production and marketing tasks outperformed all other forms of farm organization between 1992 and 1997. In Russia the most successful household farms refrain from registering as "private farms," instead choosing to remain connected in some fashion to large farm enterprises. Such producers use their connections to gain

<sup>31</sup> See table 5. In Azerbaijan this occurred only after 1996, when farm individualization and distribution of land rights started.

access to inputs, marketing channels and other services in an environment where traditional markets, if any, function poorly (O'Brien et al. 2000). Even in Turkmenistan, producers have begun to shift to family-based leasing within the nation's highly regulated environment in order to be able to access basic inputs, services, and output channels through the state marketing order system (Lerman and Brooks 2001).

Third, successful institutions of exchange—nascent markets, forms of contracting, etc.—also have many hybrid characteristics. In fact, some of the most successful transitions have not gone straight from planning to decentralized market-based exchange. Markets are emerging, but doing so quite slowly. China's experience demonstrates not only that, when politically feasible, partial reform by proceeding on a sector-by-sector basis (i.e., liberalize some products but not necessarily all) and by using a two-tier pricing system (i.e., a system of resource allocation that occurs half through planned transfers and half through the market) can end up creating markets that make the liberalization of the partially reformed sector successful. Such a reform strategy also has a longer-run effect of gradually creating a trading class that leads the push to expand the reforms and ultimately eliminates the need for planning.

In CEE the reemergence of vertically integrated supply chains reflects the necessity of private contract enforcement mechanisms for credit distribution and input supply in the absence of well-functioning public institutions. Other examples of non-traditional institutions in credit and input markets that appear successful in transition include a variety of financial instruments and enforcement institutions, including leasing of equipment, warehouse receipt systems, bank loan guarantees provided by processors to farms, and trade credit. Variations in such instruments and institutions reflect differences in commodities, local institutions, and economic structures.

To be successful these transition innovations have to adapt and be flexible to address transition and local characteristics.

Hence, whether considering institutions that create and maintain property rights or those that facilitate exchange, policies should accommodate institutions that are flexible. Flexibility is needed because transition is so uncertain and because there are many constraints that still are binding. Moreover, successful transition may trigger rapid growth which itself will require institutions to adapt quickly. For example, in land markets, the initial focus should be on stimulating short-term land leasing, an institution much more adapted to transition circumstances. Later on, long-term leases and land sales can develop. In general, nontraditional and flexible institutions have been more successful.

*Packages of Reforms.* But the lessons go far beyond measuring success or failure of reform individually. More fundamentally, it appears from the evidence on the collective transition experience that for any reform strategy to be successful it needs to include some essential ingredients. In other words, ultimately successful transition requires a complete package of reforms. All countries that are growing steadily a decade or more after their initial reforms have managed (a) to create macroeconomic stability, (b) to reform property rights, (c) to harden budget constraints, and (d) to create institutions that facilitate exchange and develop an environment within which contracts can be enforced and new firms can enter.

Our survey of the transition experiences in different countries clearly demonstrates the problems of not making progress in all areas. For example, when rights are not clear, as in Russia, producers have little incentive to farm efficiently or to invest, and restructuring is constrained. We see in other places that the creation of strong individual property rights is not sufficient. For example, in Poland in the initial years after reform, farmers had secure rights over their land. But their inability to access inputs or to sell output prevented

them from reaping the gains of specialization and improved labor effort. Both output and productivity growth performed poorly. In general, in nations that created both rights and markets, productivity rises for most of the first decade of reform (at least after the initial transition); in those where either rights or markets or both were ignored, productivity declines or is stagnant.

That said, however, one of the most powerful lessons is that although all of the pieces of the reform package are needed, there is a lot of room for experimentation. Interestingly, if one chooses any two nations that had success, there almost always was variation in sequencing and in the form of the institutions that provided incentives and facilitated exchange. In other words, in our survey of the literature, we cannot find any single optimal transition path. The optimal transition strategy in any given country is one that contains the different parts of the package; the exact nature of the parts and the order in which they were implemented, however, has been different for each nation and takes into account the institutional and political characteristics of the country.

In terms of sequencing, while all of the ingredients are ultimately needed, our paper also has shown that reform policies do not need to come all at once. For example, in China and Vietnam, reform without collapse was possible by introducing property-rights reform first and gradually implementing policies that liberalized markets and facilitated decentralized exchange. Such sequencing helped transition nations in East Asia grow rapidly in the initial years and steadily since. In CEE, however, after the initial politically led disruptions, the gradual emergence of well-defined property rights, markets, and other means of exchanging goods, services, and inputs have led to steady productivity growth.

The optimality of different sequences of policies (as well as the government's ability to implement them) almost certainly depends on the structure of the relationships between agriculture and the rest of the economy. There were important differences

between East Asia versus CEE and CIS in this respect which reflect the different stages of development of the agri-food systems in each region of the transition world. While the relationships in the food systems of China and Vietnam were fairly basic, farms in the CEE and CIS needed to be integrated into a much more industrialized agro-food supply chain. Moreover, under the Soviet system, the tasks of providing inputs to farmers and managing their operations, storage, processing, transport, and road infrastructure were all allocated to different agencies. Farming was subordinate to as many as eight different ministries, and local authorities had little control over any of these activities (Don Van Atta 1993). Warehouses and processing plants were hundreds of miles away. Hence, productivity improvements at the farm level would cause less impact unless simultaneous problems in processing and input supply industries were addressed (Brooks 1983; D. Gale Johnson 1993). This required more of an encompassing and simultaneous reform approach beyond the farm sector, including the restructuring of food-processing companies, retailers, and agricultural input suppliers.<sup>32</sup> In terms of administrative feasibility, the much more industrialized nature of the agri-food supply chain (meaning a more complex set of exchanges between a variety of companies), and the fact that the various steps were functionally separated in the central planning system in CEE and CIS, were severe constraints on optimal sequencing. A more gradual and orchestrated policy sequencing of reform strategy in the more developed economies in CEE (versus China and Vietnam) would have required more extensive information on the transformation process and the economy. In fact, most observers question the feasibility of plotting out any type of rational, systematically executed reform

<sup>32</sup> Roland (2000) refers to this as the problem of "sectoral gradualism" in the Soviet system.

path ex ante. As McMillan (1997, p. 232) puts it: *"If it were possible to plan the transition it would have been possible to plan the economy."*

*Initial Conditions and the Impact of Reforms.* As we conclude this survey of reform policies and their impact on sector performance, it is important to reflect on a crucial and hotly debated issue.<sup>33</sup> Are the differences in performance between East Asia and the rest of the transition world due to the different reform strategies or to differences in initial conditions? In the previous paragraphs we have identified at least three sets of initial conditions that have affected the output and productivity changes in transition through their effects on reform impacts. Differences in initial price distortions affected the price-reform effects; differences in technology affected the impact of rights reforms and farm restructuring; and differences in the structure of the agri-food chain affected the distortions in exchange relationships.<sup>34</sup> Each of these initial conditions favored a more successful outcome in China compared to Russia. In other words: implementing "China's reforms" in Russia would not have yielded the same results. In summary, initial conditions were influential in determining the transition performance during the first ten years of transition.

Despite the importance of initial conditions, we also fully believe that they cannot wholly explain past performance and to an even greater degree will not determine the future of these economies. Initial price levels and technologies in some sense can

be thought of as only establishing the boundaries within which the initial reforms take place. In almost all countries, there has been room for being bold or for being timid. Within regions with relatively similar initial conditions, countries have chosen different reform policies and with significant differences in growth and productivity effects. Moreover, the influence of initial conditions has declined over time. Hence, while the nature of the policies mattered in the past (over and above the effect of initial conditions), it will matter even more in the future.

Regarding future policies, another lesson that is clear from the cases of China, Vietnam, and many of the other successful countries is that in the longer run, publicly orchestrated services, such as investments in public goods and infrastructure, are needed to continue productivity growth initiated by the reforms. Regardless of how successful the initial reforms are, once producers have good property rights and incentives, and once exchange is being facilitated by functioning institutions, sustained rises in productivity will depend on investments in agricultural research, extension, and other infrastructure projects, such as investments in water control and roads, that individual farmers will not be able to finance by themselves. In the long run, agricultural growth will suffer if such investments are ignored during transition. When nations reach the point where they face these longer-run problems, in fact, reform may be close to an end and transition problems may be evolving into more traditional development problems.

Finally, an important issue that we have not addressed in this paper is the political economy of the choice of reform. Why is it that certain governments have chosen to implement gradual policies and others have opted for more radical reforms? Why have the communist governments in China and Vietnam been able to guide (and benefit from) the reform process in East Asia,

<sup>33</sup> See, for example, Balcerowicz (1994), Dewatripont and Roland (1992, 1995), Fischer (1994), Sachs and Woo (1994), Roland (2000), and Wing Thy Woo (1994).

<sup>34</sup> Initial conditions have further affected agricultural transition and performance through other ways. For example, initial legal and political constraints have affected the choice of governments in various areas, including land reforms (Macours and Swinnen 2000b; Ewa Rabinowicz 1997; Swinnen 1997) and technological biases under the communist system have affected technology changes during transition (Pomfret 2002a).



Appendix: List and Classification of Transition Countries				
Regions	Transition Countries	Central and Eastern Europe (CEE)	Commonwealth of Independent States (CIS)	Former Soviet Union (FSU)
East Asia	China			
	Vietnam			
	Laos			
	Myanmar			
Central Asia	Mongolia			
	Kazakhstan		x	x
	Kyrgyzstan		x	x
	Tajikistan		x	x
	Turkmenistan		x	x
	Uzbekistan		x	x
Transcaucasus	Armenia	x		x
	Azerbaijan		x	x
	Georgia		x	x
European CIS	Belarus		x	x
	Moldova		x	x
	Russia *		x	x
	Ukraine		x	x
Baltics	Estonia	x		x
	Latvia	x		x
	Lithuania	x		x
Central Europe	Czech Republic	x		
	Hungary	x		
	Poland	x		
	Slovakia	x		
Balkans	Albania	x		
	Bulgaria	x		
	Romania	x		
	Slovenia	x		

\* Geographically, only part of Russia, including Moscow, is in Europe.

while it took regime change in CEE and CIS to start the reforms? Why did CEE governments decide to reconstitute land to former owners, against much opposition and expert advice, while those in many CIS states issued paper shares? All these questions are important to understand if we are

not only to learn about policy effects—as we have attempted to do in this paper—but also to know how we can implement the right policies in a world where political incentives constrain policy makers' choices. This is a key subject for future research.

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