A model of manager-induced organisational stability
in post-Soviet agriculture

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ABSTRACT

Agricultural transition in the former Soviet Union has, surprisingly for many observers, not led to a widespread adoption of individual farming. This article attempts to understand some previously neglected forces behind this outcome. It develops a theoretical model of farm restructuring in which managers exploit the preferences of workers for conformity within a social reference group to cement their own power. The model provides a rationale for the persistent support among workers and managers to the status-quo organisation, despite the availability of a more efficient individual farming option. Based on empirical evidence, we argue that managers have an incentive to keep horizons of workers limited by sheltering them from pro-reform influences. Polar reform equilibria are generated that are consistent with the observed spatial patterns of restructuring. The model predicts that policies aiming at the establishment of independent farms will fail unless they induce a 'big push' in reform attitudes among workers.

Keywords: Agricultural transition; former Soviet Union; social interaction effects; farm restructuring.

1   INTRODUCTION

After one and a half decades of agricultural transition in the former Soviet Union, economists continue to be puzzled by the lack of change in farming organisation in all but a few successor countries. The persistence of large farms is particularly outstanding in Ukraine and Russia. Although entrusted with formal property rights in land and assets, agricultural workers as the new owners seem to be quite hesitant to establish smaller family farms. Due to their prevalence in most market economies, these have commonly been regarded as a blueprint for farm restructuring (KOESTER 2005). However, as LERMAN et al. (2004, 123) note in a recent monograph on the state of agricultural transition in this region,

"The overwhelming majority of farm workers in Russia, Ukraine, and Moldova prefer to keep their land and asset shares in the former collective, which in the meantime has reregistred as a corporate farm with a new market-sounding name. They waive their right of exit, at least for the time being, and pool their resources to create a corporate structure."

A common explanation for this absence of change has been that exit costs for individual workers are too high, because they lack the physical and human resources to take the risk of running a business on their own, and because up- and downstream markets are still largely geared to large collective successor farms (See MATHIJS and SWINNEN 1998 and RIZOV 2003 for expositions of these arguments).

There is no doubt that lacking resources and pervasive market imperfections are major reform obstacles. However, this explanation remains unsatisfying or at least incomplete because it is unable to deal with a number of observations that have been made in the course of transition.

First, why is it that not only the managers of large farms, but also the group of agricultural workers apparently stand united to oppose the establishment of smaller private farms in those countries where reform is stagnating?

Second, why is it that local up- and downstream markets do not develop to better serve the needs of small farmers? If family farms are a superior mode of organisation, economic incentives exist to overcome prevailing market imperfections. An explanation is hence

required why individual entrepreneurs do not emerge to set up a more favourable business environment for private farmers, as it does exist in most Western economies.

Third, why do we observe such a striking duality in reform patterns across the Commonwealth of Independent States (CIS)? Whereas large farm structures remained more or less untouched in Ukraine, Russia, Belarus and the Central Asian republics, there has been a complete dismantling of collectives and a far-reaching individualization of agriculture in the Baltics and the Trans-Caucasian countries Armenia, Azerbaijan and Georgia (ROZELLE and SWINNEN 2004). It seems that resource endowments and market failures are matters of degree, so that more evenly distributed reform outcomes across countries and regions would have been expected.

This paper offers an alternative explanation for the persistence of pre-reform farming structures in the CIS countries that is consistent with these observations. It is based on the argument that corporate farm managers exploit the tendency of workers for conformity within the collective to cement their own power. Building on commonplace observation and theories of social psychology, we argue that farm workers have preferences for behaving in conformity with peers. We then assume that farm managers benefit from the pre-reform status quo, because it assures them access to income, local power and prestige. These managers may find it expedient to manipulate their workers in a way that they reject any organisational change as being not conform with the norm. It is suggested that workers either receive monetary benefits in exchange for behaving loyally to the manager, or managers may actively keep the horizon of farm workers limited. They do this by withholding information concerning privatisation rights, preventing political organisation, not allowing outsiders to invade the village or start businesses with defecting workers, and by stressing the necessity of 'collective solutions' to problems.

By modifying a framework due to SCHAFFNER (1995), these arguments are formalised and their theoretical implications derived. It is shown that farm managers have an incentive to employ workers that are loyal to them and to alienate outsiders who might undermine this loyalty, and that they may be willing to sacrifice farm profits for benefits that arise from keeping the pre-reform structures. Workers in turn may find the status-quo organisation of agriculture just 'normal' and thereby perpetuate its existence, although a higher paying reform alternative exists. Whether farm managers pay workers higher wages to keep them loyal or whether they sequester them depends on the relative costs of both options, and a mixture of both strategies may prevail in a given region. A regional equilibrium is derived in which either all corporate farms in a given area remain intact or all farms are dissolved. These implications are shown to be largely consistent with the evidence.[1]

2 THE MODEL

2.1 Individual vs. social utility

Despite its intuitive plausibility, economists have only recently paid increasing attention to the formal modelling of social interaction effects (see BROCK and DURLAUF 2001 for an overview). A standard approach has been to split the utility function into an individual and an additively separable social component. Furthermore, it is commonly assumed that deviations far from group average are penalised more strongly (JONES 1984). Given a choice variable, $\lambda \geq 0$, the resulting composite utility function, u^*, may then be represented as follows:

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[1] The following is a shortened version of PETRICK and CARTER (2007), to which the reader is referred for further details.

$$u^* = u\big(g(\lambda)\big) - v\big((\lambda - \bar{\lambda})^2\big), \tag{1}$$

with individual utility $u(.)$, social utility $v\big((\lambda - \bar{\lambda})^2\big)$. The function $g(.)$ transforms λ into a utility-relevant magnitude, for example income, and $\bar{\lambda}$ is average behaviour in the social reference group. Moreover, $u', v' > 0$.

As will be discussed in detail below, (1) formalises the idea that individuals have preferences for conformity with their peers, or doing what is the normal thing to do in a given social reference group. Both increasing positive or negative deviations from group average cause increasing discomfort, but there is no discomfort if everybody in the group behaves identically and chooses the same λ. As a result, outcomes will likely be homogenous within a social reference group, but may be radically different between groups.

2.2 Social reference groups and the geography of the model

We distinguish two major reference groups that may influence the behaviour of villagers, which we denote *regional* and *national*. The regional reference group is the community of people living in geographical proximity to the individual. We pragmatically identify this with the county or *raion*, which has been the lower level of the two-tiered administrative system throughout the former Soviet Union. In most rural regions of Ukraine and Russia, each collective farm forms the economic and social centre of a village, and a *raion* contains a dozen or so collective farms. Sociological field work in rural Russia has shown that there has been some mobility within localities, for example because villages were abandoned by the government and the population forced to relocate to nearby places. However, most rural people spend their entire life in a certain area, where they are surrounded by their relatives (O'BRIEN et al. 2000, 95). People living in a region are more likely to meet in person on a regular basis and hence form a natural social reference group.[2] Social interaction within this reference group, and information flow in particular, is hard to manipulate by local authorities.

As a second reference group we posit a wider, potentially non-rural population that provides an alternative blueprint for what is the right thing to do and how to behave. With regard to de-collectivisation in agriculture, the mode of behaviour of this social reference group is codified in the national reform legislation, which gives an individual worker the right to leave the collective and withdraw his/her assets. It is identified with a reform-oriented, urban majority, and with family farms in Western Europe or North America, which are presented as a model for agricultural restructuring. In countries with a strong tradition of individualised farming prior to collectivisation, the members of former generations may constitute part of the reference group. Information about this social reference group is primarily transmitted via the media, through television or newspaper, through tradition, but also via agents of change who enter a community, in village congregations, or by word of mouth.[3] In contrast to the narrow reference group, interaction with the wide reference group can assumedly be influenced by the local farm manager. He may or may not keep the horizon of his workers limited by

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[2] In addition, many regions are homogenous in ethnic terms, some of them officially recognised as autonomous areas subject to the ethno-territorial principle of both the former Soviet and the current Russian constitutions (STADELBAUER 1996, 42-49).

[3] In Russia, this reference group has been represented by the reform-oriented Association of Peasant Farms and Agricultural Cooperatives of Russia (AKKOR). According to WEGREN (1995, 28-29), AKKOR had a network of branches in every oblast by the mid 1990s. Since its foundation it has held annual congresses and publishes an own weekly newspaper, 'The Russian Farmer'. It supports private property and freedom of land use. Although its primary constituents are private peasant farmers, it appears to have more support in urban than in rural areas. Similar movements exist in other CIS countries.

withholding information concerning privatisation and other civil rights, preventing political organisation of farm workers, not allowing outsiders to invade the village, inhibiting the creation of support networks or businesses for private farmers, frightening defectors, and stressing collective identity and local 'collective solutions' to problems.[4] The degree to which the manager keeps horizons limited determines how strongly farm workers identify themselves with the wider, reform-minded reference group, as will be formalised below.

2.3   Workers' and managers' choice

Farm workers have preferences, *u*, for income, *y*, and additive preferences, *v*, for conformity with other workers in their reference group. Their income depends on a binary loyalty decision, λ. They may either stay on the local corporate farm, $\lambda = 1$, in which case they support the farm manager in local politics, e.g. voting for him in the farm assembly, and do not exert their right in asset shares of the farm. Loyal workers receive an annual wage, *w*. Labour contracts can be enforced costlessly by the corporate farm manager and there is no other employer in reach for farm workers than the local corporate farm. Alternatively, workers may choose to become independent farmers and withdraw their assets from the corporate farm, $\lambda = 0$, in which case they receive an income from private farming, $f(\overline{\lambda}^r)$, where $\overline{\lambda}^r$ the share of loyal workers in region *r* who have not taken up private farming and have loyally remained on the corporate farm. We assume that $f' < 0$ to capture various types of network externalities, for example the necessary political support for restructuring up- and downstream markets for private farmers, and learning processes and information spill-overs among reform oriented entrepreneurs to reduce uncertainty and ambiguity in decision making.[5]

It is assumed that farm workers make comparisons among each other with regard to how loyal they are to the corporate farm management. An individual perceives the more discomfort the stronger he/she deviates from average group behaviour in terms of loyalty, expressed by the share of loyal workers in the reference group, $\overline{\lambda}$. Utility is assumed to decrease with the composite term $(\lambda - \overline{\lambda})^2$. For simplicity it is assumed that both utility functions are linear, hence $u', v' = \text{const} > 0$.

A farm manager allocates the labour force of his farm, *N*, and other assets to produce composite farm revenue, by using a given technology. Corporate farm assets are the sum of all individual asset shares, and asset shares can be withdrawn by workers if they wish. The manager is assumed to be the residual claimant of farm profit.[6] A manager therefore benefits from the loyalty of farm workers, who support him politically, perpetuate the existence of the collective farm and thus secure his income and local power. Although not modelled formally here, benefits for the manager may also be of a psychological nature.[7] In the following, we focus only on the loyalty decision of workers and simply assume that all other production

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[4]   See CSAKI and LERMAN (1997, 4) for empirical evidence on how farm managers use information control to keep horizons limited.

[5]   While there is now an established body of literature on economic network effects in agglomeration, only more recently has interest increased in how social interactions foster the emergence of entrepreneurs in a given region (see MINNITI 2005 for an overview).

[6]   Little is known about the remuneration of the core management of corporate farms. KOESTER (1999, 216) reports that many of the farm chairmen appear to enjoy a respectable living standard despite the poor economic situation of agriculture. It is hence assumed that they are the de facto residual claimants of profits.

[7]   Psychological benefits may arise because managers enjoy being the 'head of a commune' (AMELINA 2000, 503). The manager may also have a preference for seeing agricultural production organized in corporate farms. This could be the case if he/she has professional concerns that the farm's dissolution will be economic mischief and lead to a food crisis (KOESTER 2005, 109).

factors available to the manager are allocated in a standard profit-maximising way, hence generating a gross profit of Π for the manager.

Being aware of social reference group effects among his/her workers, a manager can deliberately keep the horizon of farm workers limited by sheltering them from the national reference group and by exerting explicit or implicit political and social pressure on them, as described above. Let $\theta = 1$ if the manager actively keeps the horizon of his loyal workers limited and $\theta = 0$ otherwise, with $\theta \in [0..1]$. Limiting the horizon has an influence on which reference group farm workers use to assess their utility from behaving loyally to the manager. If workers' horizon is kept limited, they compare their own behaviour with that of all other workers in the region, $\bar{\lambda} = \bar{\lambda}^r$. If the horizon is not kept limited, they compare their behaviour with a wider, national reference group, $\bar{\lambda} = \bar{\lambda}^n$. The national reference group is assumed to be at least moderately reform-minded on average, so that $\bar{\lambda}^n < 0.5$. As a consequence, workers who accept the wider social reference group always experience less discomfort from choosing disloyalty than from remaining loyal to the manager. It is assumed that $\bar{\lambda}^n$ is exogenous and can not be influenced by decisions of individual farm workers. By choosing θ, the manger determines the relative weight of the two possible reference groups of workers: $\bar{\lambda} = \theta \bar{\lambda}^r + (1-\theta) \bar{\lambda}^n$. How costly it is to keep horizons limited is given by a cost function $C^\theta = C^\theta(\theta, R)$. Costs may arise from own political activity of the manager to turn down reform-minded influences from outside the region, or bribes to public authorities who might stand up for civil rights of workers. This function depends on a vector of regional characteristics, *R*, that includes the existence of conservative vs. reform-oriented political networks in a given region, strength of collective vs. individual traditions, distance to urban centres, climatic and technological dimensions of agricultural production, etc (such differences are discussed, e.g., by AMELINA 2000). It is assumed that $C_1^\theta > 0$ and $C_{11}^\theta > 0$, implying that it is marginally costlier to achieve higher levels of sheltering. The survival of the corporate farm in a given village depends on the ability of its manager to assure loyalty of a sufficient number of workers in that village, subject to a budget constraint.

The optimisation problem for a farm worker is hence:

$$\text{Max}_{\lambda} \; u^w = u(y) - v\left((\lambda - \bar{\lambda})^2\right) \tag{2}$$

subject to:

$$y = \begin{cases} w & \text{if } \lambda = 1 \\ f(\bar{\lambda}^r) & \text{if } \lambda = 0 \end{cases} \tag{3}$$

$$\bar{\lambda} = \theta \bar{\lambda}^r + (1-\theta) \bar{\lambda}^n. \tag{4}$$

The optimisation problem for a manager in village *j* in region *R* is:

$$\text{Min}_{\theta, w} \; C^m = w N_j + C^\theta(\theta, R), \tag{5}$$

subject to:

$$w \le \frac{\Pi - C^\theta}{N_j} \tag{6}$$

$$u^w(\lambda = 1) - u^w(\lambda = 0) \ge 0 \tag{7}$$

where constraint (6) defines the corporate farm's budget constraint and constraint (7) defines the loyalty participation constraint (hereafter denoted as the *LPC*). Both will be just binding

under optimising behaviour. Note that in the model corporate farm output only depends on retaining a loyal labour force and the manager's task is simply to minimise the cost of keeping workers loyal.

Managers make decisions concerning θ and w, to which workers react by choosing λ, according to the utility they derive from behaving loyally or disloyally to the manager. Because the decision of a single worker not only depends on the manager's offer but also on the behaviour of other individuals in his/her social reference group, identical offers by managers may lead to different workers' response in different regions. This is analysed in further detail below.

To summarise the intuition, workers' relative remuneration is, in two distinct ways, influenced by social interaction effects. First, there is a *market effect*. The latter may be described as a network externality or critical-mass phenomenon that influences the monetary returns from independent farming. The more workers turn into private farmers, the easier it is, both economically and politically, to establish independent farming as an accepted organisational mode. Second, there is a *psychological effect*, according to which non-conformity with the reference group causes discomfort.

3   LEAST-COST ELICITATION OF LOYALTY

Recalling that we use *LPC* to denote the loyalty participation constraint ($LPC \equiv u^w(\lambda = 1) - u^w(\lambda = 0)$), the minimizing the cost of loyalty elicitation yields the following first-order condition:

$$\frac{C_\theta^m}{LPC_\theta} = \frac{C_w^m}{LPC_w},$$

which in the optimum state is equal to the marginal cost of securing loyalty of workers.

This describes how θ and w jointly contribute to ensure workers' loyalty and can also be written as:

$$\frac{C_w^m}{C_\theta^m} = \frac{LPC_w}{LPC_\theta}. \tag{8}$$

The left hand side of (7) describes an *isocost curve* of securing loyalty. The right hand side describes a *loyalty indifference curve*, that is the locus of all θ, w combinations where the joint effect of θ and w just suffices to make $u^w(\lambda = 1)$ as high as $u^w(\lambda = 0)$. Analysing the single components of the optimality condition allows us to be more precise with regard to the shape of the isocost and loyalty indifference curves. From the definition of C^m in (5) follows that $C_w^m = N_j = \text{const}$, that is the costs of a marginal wage increase is determined by the number of workers. Furthermore, given our earlier assumption about the costs of limiting the horizon, $C_\theta^m = C_1^\theta > 0$. The more θ is used, the costlier is the marginal increase. The isocost curve therefore has a concave shape (Figure 1). The budget constraint (6) defines a maximum wage $w_{\max} = (\Pi - C^\theta)/N$ the manager is able to offer. It is determined by the collective farm's productivity, the extent to which horizons are actively limited and potential opportunity costs of the manager (assumed zero henceforth). If there is no limiting of horizons, $w_{\max}$ can be drawn into Figure 1 as shown, assuming that the solid cost curve

displays the manager's budget. $w_{\max}$ then denotes the locus at which $w = f$ for a given $\overline{\lambda}^r$ if $\theta = 0$, that is loyalty elicitation occurs only through wage payments.[8]

Because C^θ is also dependent on regional characteristics, R, different regions exhibit different isocost curves. The southeast shift shown in Figure 1 is induced by relatively increasing costs of limiting the horizon vis-à-vis the wage costs.

Figure 1: Isocost curves for securing the loyalty of workers
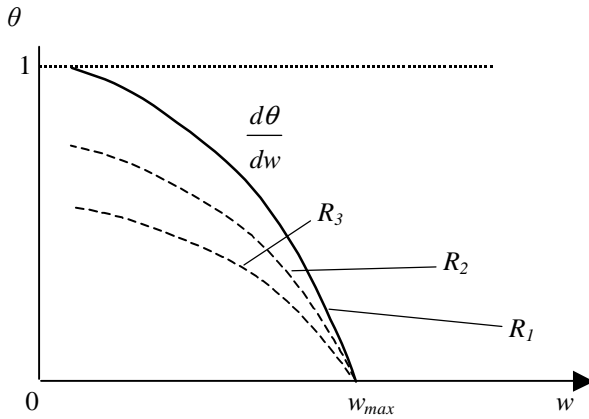
Source: authors' figure.

It is also possible to determine the shape of the loyalty indifference curve. To ease the analysis, we assume that $\overline{\lambda}^n = 0$. Under this assumption and after substituting (2) to (4) into the *LPC*, the latter becomes:

$$LPC \equiv u(w) - v((1 - \theta\overline{\lambda}^r)^2) - u(f) + v((\theta\overline{\lambda}^r)^2) = u(w) - u(f) - v + 2v\theta\overline{\lambda}^r.$$

The implicit function allows us to determine the slope of loyalty indifference curve as:

$$\frac{d\theta}{dw} = -\frac{LPC_w}{LPC_\theta} = -\frac{u'}{2v\overline{\lambda}^r}.$$

Under the assumption of constant marginal utility of income for the loyal worker, this term is a constant. The loyalty indifference curve, within the [0..1] boundaries, is thus a straight line that becomes steeper as $\overline{\lambda}^r$ decreases. In words, how effective it is to keep horizons limited in a given region depends on how many workers are (still) loyal. Keeping horizons limited is a perfect substitute for increasing wages, as long as there are loyal workers in the region and as long horizons are not yet fully limited.

Both the isocost and loyalty indifference curves may now be drawn into one figure, in which the tangency point satisfies the optimality condition (8) and thus determines the optimal choice of θ and w for securing loyalty of workers (Figure 2), denoted with asterisks. Note first that, for a given $\overline{\lambda}^r$, different isocost curves in different regions as displayed in Figure 1

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[8] In actual practice, a part of the wage may be paid in-kind, including inputs and machinery access for the worker's household plot and other non-monetary benefits, such as discounted meals in the corporate farm's cafeteria or access to health services.

would lead to varying optimal elicitation strategies. Regional characteristics determine how managers elicit loyalty and how costly it is. In regions where politically influential managers cannot afford to pay higher wages, they will resort to a strategy of keeping horizons limited in order to secure the survival of their corporate farm.

Figure 2: Reference group effects and the optimal choice of θ and w
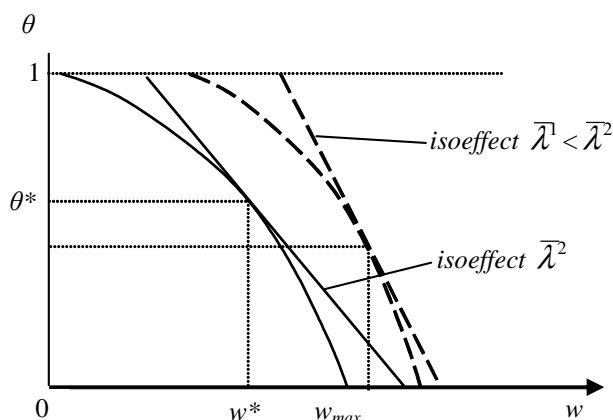
Source: authors' figure.

Furthermore, Figure 2 shows the effects of changes in average reference group behaviour as captured by $\bar{\lambda}^r$. A decrease in average loyalty of the reference group has two effects, as shown by the move from the higher $\bar{\lambda}^2$ to the smaller $\bar{\lambda}^1$. First, the loyalty indifference curve shifts out to the right, because workers need a higher compensation for their increased disutility from remaining loyal. Furthermore, it becomes steeper because limiting of horizons is now less effective and the wage equivalent to a given increase in θ shrinks. As a result, the manager needs a larger budget to keep workers loyal; the new isocost curve obeying the tangency condition lies further northeast. In addition, relatively less limiting of horizons and higher wage payments will be in the least-cost solution of the manager. Note that the manager may have already exploited his maximum budget, denoted by $w_{\max}$ on the horizontal axis, so that it is no longer feasible to keep workers loyal to the collective. This would indeed be the case in Figure 2.

4 REGIONAL REFORM EQUILIBRIUM WITH SOCIAL INTERACTION EFFECTS

This section analyses how the interaction between managers and workers and among workers drives reform choices in the model and shows how polar equilibria may be induced, with either all or no farm workers loyal to corporate farm managers. To do this, we focus on a single geographic region comprised of identical corporate farms. We proceed in three steps that are illustrated by the three charts in Figure 3. First, we investigate the pure market effect of social interaction. After that, the psychological effect and the effect of limiting horizons are added.

Figure 3 (a)-(c) display the wage workers require to remain loyal as a function of the regional share of loyal workers, $\bar{\lambda}^r$. The solid line in each graph hence denotes the participation wage that assures that the *LPC* (7) is just binding.
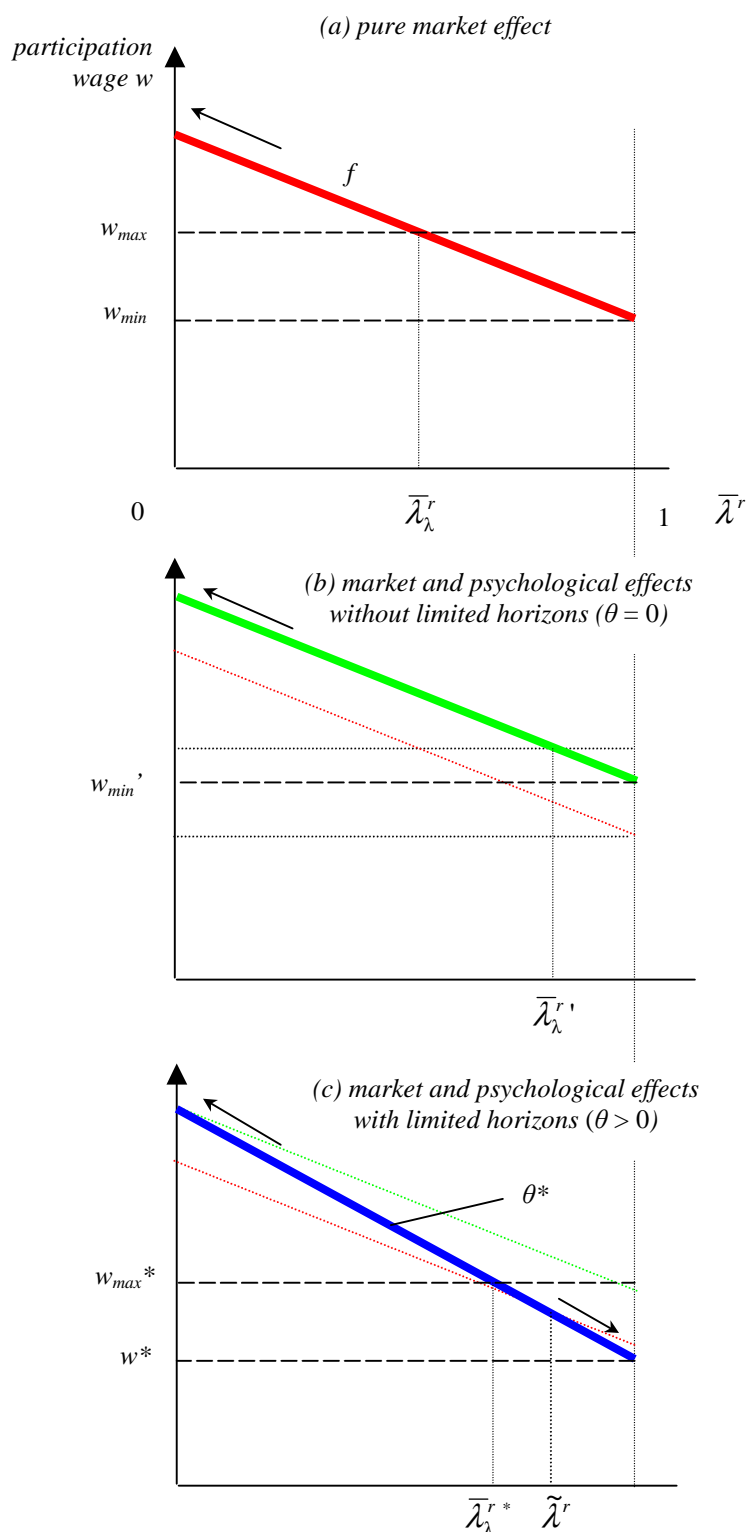
Figure 3 (a) assumes that there is no social utility associated with loyalty or disloyalty (*i.e.*, $v = 0$). The solid line shows the pure monetary or market effect of each worker's loyalty decision, driven by the productivity of private farming, *f*. It illustrates how positive network externalities from establishing independent private farms lead to higher pay-offs if more workers choose disloyalty. Wage payments higher than *f* imply that workers remain loyal, whereas payments lower than *f* lead workers to withdraw.

The term $w_{min} = f(\overline{\lambda}^r = 1)$ denotes the minimum wage the manager must offer if all workers in the locale are loyal. Note that this is the circumstance when private farming is least productive. The term $w_{max} = \dfrac{\Pi}{N}$ indicates the maximum wage that the manager can afford to offer, given the productivity of the collective farm. The intersection of w_{max} with the solid *f*-line defines a regional lower threshold of loyal workers, $\overline{\lambda}^r_\lambda$. If $\overline{\lambda}^r$ falls below this lower threshold, corporate farming will no longer be sustainable in the region and the only institutional equilibrium for the region will be complete agricultural privatisation.

We thus see the sense in which this model has a tipping point at $\overline{\lambda}^r_\lambda$. At loyalty levels above $\overline{\lambda}^r_\lambda$, corporate farming will be retained. But once a critical mass of reform-minded workers is reached, the reform equilibrium is self reinforcing. For this reason, even though independent farming yields higher pay-offs, external forces, for example an information campaign, may be necessary to reach this equilibrium. How likely it is that private farms emerge depends on the location of $\overline{\lambda}^r_\lambda$. The further this is on the left, the higher the probability that collective farms remain intact.

We consider now what happens when we reintegrate social utility in the model. Initially, we assume that horizons are not limited such that social norms are set by the national level reference group, *i.e.*, $\overline{\lambda} = \overline{\lambda}^n < 0.5$. Under this assumption, workers are influenced by pro-reform groups and feel uneasy about behaving loyally. As illustrated in Figure 3 (b), the incorporation of social utility under these assumptions results in a parallel shift of the *LPC* to the northeast. Loyalty is now more expensive to elicit, and the threshold point, $\overline{\lambda}^r_\lambda$, shifts to the right. The range over which a regional loyalty equilibrium obtains thus shrinks, making it more likely that the region will shift to the full reform or privatisation equilibrium.

Figure 3: Regional loyalty equilibrium with different social interaction effects

(a) pure market effect

participation wage w

w_{max}

w_{min}

f

0 $\overline{\lambda}_\lambda^r$ 1 $\overline{\lambda}^r$

(b) market and psychological effects without limited horizons ($\theta = 0$)

w_{min}'

$\overline{\lambda}_\lambda^r{}'$

(c) market and psychological effects with limited horizons ($\theta > 0$)

$\theta*$

$w_{max}*$

$w*$

$\overline{\lambda}_\lambda^{r*}$ $\tilde{\lambda}^r$

Source: authors' figure.

While social effects thus are a threat for the existence of the collective farms (and hence the income base and power of the manager), they also provide a mechanism that the manager can use to avert this 'farmer threat' (VAN ATTA 1993). In our model, the manager can either make

loyalty more attractive by increasing wages, or influence the social reference group of workers by actively limiting their horizon. The latter effect is displayed in chart (c), where we permit the manager to choose θ to be greater than zero. As analysed in the previous section, the optimal θ increases with $\bar{\lambda}^r$. For illustrative purposes, we re-draw the *LPC* in Figure 3 (c) holding θ fixed at the optimal level for some relatively high level of $\bar{\lambda}^r$. The solid line illustrates those wage levels which just meet the *LPC* for that fixed level of θ. For that given level of θ, the *LPC* will cut from below the *LPC* for the no social effects case. We now define a $\tilde{\lambda}^r$ as the critical value of $\bar{\lambda}^r$ such that $\bar{\lambda} = \theta\bar{\lambda}^r + (1-)\bar{\lambda}^n = 0.5$. At this $\tilde{\lambda}^r$, the individual worker's disutility from choosing either loyalty or disloyalty is just equal. For $\bar{\lambda}^r > \tilde{\lambda}^r$, managers can elicit loyalty by offering a wage lower than that required to elicit loyalty in the absence of social effects. For $\bar{\lambda}^r < \tilde{\lambda}^r$, a higher wage must be paid to elicit loyalty. However, this wage will still be weakly less than that required to elicit loyalty when managers do not limit horizons in the presence of social effects. Finally, note that $w_{\max}$ and the budget available to pay wages ($\dfrac{\Pi - C^\theta}{N}$) diminishes when managers choose $\theta > 0$. But despite this offsetting effect, the capacity of the manager to limit horizons will always shift the threshold loyalty level, $\bar{\lambda}^r_\lambda$, re-expanding the range over which corporate farming can be sustained, as shown in Figure 3 (c).

By changing the pay-offs, keeping the horizons limited has another profound effect on the regional equilibrium which is very much in the interest of the manager: it establishes a second polar equilibrium for average regional loyalty levels to the right of $\tilde{\lambda}^r$. Once the majority of workers has decided to remain loyal, this process is self-reinforcing, as indicated by the additional solid arrow. By stressing the collective identity of workers and keeping away any reform-minded attitudes from villagers, the manager can establish a stable equilibrium that guarantees the existence of the collective farm. Because workers feel comfortable with doing what is, in the community, the normal thing to do, they have an incentive to choose loyalty if the majority did so already. With regard to workers' pay-off, however, the polar loyalty equilibrium as drawn in chart (c) is inefficient as compared to the full de-collectivisation outcome. Even so, because limiting the horizon shifts the threshold loyalty level $\bar{\lambda}^r_\lambda$ back to the left, it makes it even more likely that a loyalty equilibrium occurs.

5 TESTABLE IMPLICATIONS AND SOME EVIDENCE

Given our basic assumptions concerning social interaction effects among workers and managers' incentives to keep horizons limited, the model provides a number of testable implications:

1. Within a pool of regions with comparable social and geographical characteristics, there are either regions which totally de-collectivise, so that there are no loyal farm workers and a widespread establishment of private farms, or regions which keep collectives completely intact, so that there are only loyal farm workers and a 'loyalty culture' persists. Because only polar reform equilibria are stable, there will be no intermediate or mixed restructuring outcomes, ceteris paribus.

2. Persisting loyalty equilibria can only be overcome if a sufficient number of workers decide to leave the collective farm, utilise the network externalities in private farming posited by the model and thus 'jump' over the critical lower bound loyalty level. If managers keep horizons limited, marginal improvements in the relative returns to independent farming have no effect on workers' loyalty.

3. Depending on the relative costs of monetary incentives vis-à-vis limiting horizons in a given locality, managers use different mechanisms to elicit loyalty. Where costs of sequestering villagers from external influences are lower, managers will – ceteris paribus – reduce wage levels and more strongly keep horizons limited. Where keeping horizons becomes exceedingly costly because widespread access to information and unambiguous reform policies ease coordination on a de-collectivisation equilibrium, collective farms will dismantle unless managers are able to offer higher wages.

A first piece of evidence that is broadly consistent with the hypothesis of polar de-collectivisation results comes from a simple comparison of reform patterns in Table 1. All countries given in the table started from the Soviet model of large-scale collective and state farms, which usually allowed individual farming only in the form of subsidiary household plots. In the first group of countries given in the table, the overwhelming share of land was individualised already five years after reforms had started.[9] On the other hand, farm restructuring has been almost absent in all of the bigger successor countries, where the share of individual farms rarely has passed the 20-percent mark of total land use even ten years after the start of reforms. Moreover, a large share of this is represented by the millions of attached household plots that already existed during Soviet times, and it is unclear how much land has simply been abandoned.

Table 1: Share of individual farms in total agricultural land of some former socialist countries (percent)

	Pre-reform	5 years after start of reforms	8-10 years* after start of reforms
Examples for de-collectivisation equilibria:			
Albania	3	95	n.a.
Armenia	7	95	90
Georgia	12	50	44
Latvia	4	81	87
Lithuania	9	64	85
Examples for loyalty equilibria:			
Belarus	7	16	12
Russia	2	8	13
Kazakhstan	0	5	24
Moldova	7	12	20
Ukraine	6	10	17

* depending on data availability.

Source: Data compilation taken from ROZELLE and SWINNEN (2004, 426).

This broad comparison does not take into account the various differences in initial conditions which were present despite a common Soviet heritage and which may have explanatory power for reform outcomes. For example, ROZELLE and SWINNEN (2004, 439) argue that in countries with labour-intensive technologies, individualisation yielded substantial gains in technical

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[9] Also Georgian agriculture is largely dominated by individual farming. Comparatively low figures in the table are due to the fact that a considerable share of land lies idle in former state farms, which ceased to operate during the civil war 1992-94 (LERMAN et al. 2004, 123).

efficiency and thus induced restructuring. However, in line with the theoretical implications of our model, even in adjacent regions with similar production conditions, highly different reform outcomes emerged. A first example are the orchard, vineyard and tobacco growing regions of Transcarpathia, Moldova, the Crimea and parts of Caucasus. These continued to be cultivated by corporate farms in Ukraine and Moldova throughout the 1990s, while a widespread parcellisation took place in the Trans-Caucasian Republics (see KEGEL 1997 for Georgia). A second examples is the Baltic dairying and pig rearing region. This most western region of the Russian forest zone now covers Latvia, Lithuania, Belarus and Northern Ukraine (STADELBAUER 1996, 481). Whereas production is still dominated by collective farm successors in the latter two countries, individualisation has progressed substantially in the Baltic countries.

In PETRICK and CARTER (2007), we present further evidence that is consistent with these implications. Because there has been little systematic research on the relevance of social interaction effects in our context, the results are tentative and more detailed empirical treatments remain for future work.

6 CONCLUSIONS

The presence of limited horizons has implications for the design of policies aiming at the establishment of independent farms. Given a loyalty equilibrium, it is not sufficient to improve managerial resources and relax factor market constraints for prospective individual farmers, as argued e.g. by RIZOV (2003). The effect of marginal improvements in individual farm profitability on the loyalty equilibrium in our model will be nil. Crucial for reform in the present model is the formation of a critical mass of workers who are willing to establish independent farms. This could possibly be achieved by support programmes which make loyal farm workers aware of the fortune of successful non-loyal workers, which lead to the emergence of individual consciousness raisers among the group of loyal farm workers (and not only to the spread of disembodied ideas), or which make it more costly for farm managers to keep the horizons of workers limited. In other words, a 'big push' in reform attitudes among workers is a precondition for reaching the full de-collectivisation equilibrium, which may be induced by a sufficient number of positive examples of independent farming in a region. Whether fifteen years of stagnation in the non-reforming countries have reinforced or eroded existing norms of collective production may be an interesting issue for empirical research.

Following SCHAFFNER (1995), our theoretical model represents a subtle departure from the traditional assumption of exogenous preferences. By keeping horizons limited, a manager can shape the social reference group of workers and thereby influence what they regard as the normal thing to do. Moreover, the manager can, for his or her own benefit, deprive workers of a more productive reform option. Workers then evaluate individual farming by referring to their current reference group, although they would be exposed to a different reference group if they left the collective farm. Workers who for some reason escape the limited horizon find themselves better off than they thought they would be, and better off than they had been. We consider this an interesting and fruitful way of combining economic analysis with social psychology and broader ethnographic and sociological insights to uncover the power asymmetries prevalent in the post-Soviet countryside, which may find useful applications in other contexts as well.

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