Efficiency and Productivity of Ukrainian Agroholdings

Alfons Balmann
Karin Kataria
Franziska Schaft
Iryna Kulyk

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Motivation

• Agricultural production in Ukraine for a long time far behind expectations
  – institutional deficits (agric. policies, legal framework, corruption,…)
  – poor macroeconomic conditions (economic instability, inflation)
  – weak food chain
  – persistence of dualistic farm structure???
• Booming food prices since 2006 attract investments in agriculture
  – worldwide tendency (low interest rates, "land grabbing")
• Recent general trends in agriculture
  – increasing importance of vertical integration / cooperation
  – increasing capital and knowledge intensity of agriculture
Outline

- Motivation
- Background and empirical facts for Ukrainian Agroholdings
- Efficiency and productivity of agroholding versus non-agroholding farms
- Self-assessment of Ukrainian agroholding managers
- Stock market responses
- Conclusions and lessons to be learned
### Empirical facts

#### Some examples (Ukraine)

<table>
<thead>
<tr>
<th>Company</th>
<th>Area (1000 ha)</th>
<th>Ownership</th>
<th>Year</th>
<th>Specialization:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avangardco/UkrLandFarming</td>
<td>480</td>
<td>Ukr</td>
<td>2010</td>
<td>Grain + Sugar</td>
</tr>
<tr>
<td>NCH Capital</td>
<td>450</td>
<td>US</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mriya</td>
<td>298</td>
<td>Ukr</td>
<td>2008</td>
<td>Oil crops, Poultry</td>
</tr>
<tr>
<td>MHP</td>
<td>285</td>
<td>Ukr</td>
<td>2008</td>
<td>Livestock</td>
</tr>
<tr>
<td>Ukr. Agr. Investm.</td>
<td>260</td>
<td>Rus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kernel Group</td>
<td>247</td>
<td>Ukr</td>
<td>2012</td>
<td></td>
</tr>
<tr>
<td>Astarta</td>
<td>240</td>
<td>Ukr</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>HarvEast</td>
<td>220</td>
<td>Ukr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agrotron</td>
<td>151</td>
<td>Ukr</td>
<td>2009</td>
<td></td>
</tr>
<tr>
<td>Sintal</td>
<td>146</td>
<td>Ukr</td>
<td>2008</td>
<td></td>
</tr>
</tbody>
</table>
Empirical facts
Are agroholdings performing better?

Data Envelopment Analysis

- One output, four inputs
  - Value of total production, tsd UAH
  - Material costs, tsd UAH (seeds, feedstuffs, fertilizer, etc)
  - Capital costs, tsd UAH (depreciation)
  - Number of full time employees
  - Total agricultural land, ha

- Accountancy data covering the years 2008-2011 (UCAB)
  - Only crop farms considered (more than 90% of value of output from crop)
  - Resulting data set consist of 924 farm-year observations (i.e. 231 farms/year)
    - 173 independent farms
    - 58 farms (25%) members of an agroholding
Are agroholdings performing better?

Efficiency plot for Ukrainian cash crop farms (2011)

- In general: huge inefficiencies
- Higher average efficiency of agroholding farms in recent years
### Are agroholdings performing better?

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-agroholding farms (N=692)</th>
<th>Agroholding farms (N=232)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE (technical efficiency) under crs 2008 - 2011</td>
<td>Mean</td>
<td>Std.Dev.</td>
</tr>
<tr>
<td>CRSTE</td>
<td>0.397</td>
<td>0.160</td>
</tr>
<tr>
<td>TE (technical efficiency) under crs within years</td>
<td>N=173 per year</td>
<td>N=58 per year</td>
</tr>
<tr>
<td>CRSTE 2008</td>
<td>0.522</td>
<td>0.193</td>
</tr>
<tr>
<td>CRSTE 2009</td>
<td>0.660</td>
<td>0.181</td>
</tr>
<tr>
<td>CRSTE 2010</td>
<td>0.596</td>
<td>0.187</td>
</tr>
<tr>
<td>CRSTE 2011</td>
<td>0.454</td>
<td>0.189</td>
</tr>
</tbody>
</table>

- Little differences between agroholding and non-agroholding farms before 2010
- Since 2010 agroholding farms more efficient on average
Are agroholdings performing better?

Technical efficiency (crs) by agroholding (with more than one operation in sample)

- Huge differences among agroholdings
- Initially poor performing agroholdings are catching up!
Views of agroholding managers (2012)

- Expansion and growth
- Internationalization
- Diversification
- Specialization
- Consolidation
- Efficient production
- Vertical integration
- Horizontal integration
- Protection from a takeover
- Strengthening human resources
- Improving financial situation
Views of agroholding managers (2012)

Perceived main constraints:

- Lack of highly-qualified labor in farms
- Lack of highly-qualified management in farms
- Excessive number of employees on farms
- Lack of capital
- Low level of technology/ outdated machinery
- Unprofitable areas of production
- VAT reimbursement
- Thefts on farms
- Continuation of low-profitable branches of the business
- Budget subsidies
- Law & contract enforcement
- Corruption/ lack of transparency
- Moratorium on land sales/ purchases
- Access to credits
Views of agroholding managers (2012)

- Unpredictability of government policy in the agricultural sector
- Risk of hostile takeover
- Volatility of sale prices
- Volatility of currency prices
- Reduced availability of credit financing
- Lack of storage facilities
- Lack of facilities for products handling/transportation
- Unavailability and high cost of yield loss risk insurance/mitigation
How do the stock markets respond?

MHP (285,000 ha, poultry: 50% production share in Ukraine, IPO 2008)

2012 harvest yields
By tonnes per hectare

<table>
<thead>
<tr>
<th>Crop</th>
<th>MHP’s average*</th>
<th>Ukraine’s average**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>7.6</td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>Sunflower</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Rapeseed</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Soya</td>
<td>1.7</td>
<td></td>
</tr>
</tbody>
</table>

* Tonnes per hectare
** Source: SSCU
How do the stock markets respond?

MHP (285 000 ha, poultry: 50 % production share in Ukraine, IPO 2008)

Agroton (151 000 ha, arable farming, IPO 2009)

Wheat yields

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHP:</td>
<td>5,8</td>
<td>4,7</td>
<td>5,0</td>
<td>5,1</td>
</tr>
<tr>
<td>t/ha</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agroton:</td>
<td>2,7</td>
<td>3,6</td>
<td>2,7</td>
<td>3,2</td>
</tr>
<tr>
<td>t/ha</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary

- Huge productivity deficits remain
  - for agroholding farms as well as for non-agroholding farms
  - agroholdings recently more successful in fighting main deficits

- Perception of agroholding managers
  - main challenge: increasing efficiency
  - main constraints: management skills, know-how & human capital
  - main risks: unpredictable policies, corruption and price volatilities

- Stock markets' responses
  - investments in Eastern European agriholdings are attractive
  - poor performance is sanctioned
Lessons to be learned

- Emergence and success of agroholdings
  - based on economic conditions "out of equilibrium"
    - institutional deficits: finance, human resources, legal system
    - network externalities within the food chain
  - fostered by booming agricultural markets and intl. investments

- Economic success cannot just be bought
  - success has to be worked out
  - agroholdings will either learn and develop or fail

- Societal opportunities and risks
  - going public requires transparency and good business practices
  - CSR necessary to address concentration of power in rural areas
An owner's view of a Russian agroholding (Ekoniva 2011)