Presentation Outline

• Setting the scene: grain production and exports
• The cost of transport and logistics
• Transport Modes:
  ✓ Road
  ✓ Rail
  ✓ River
• Storage
• Regulations
• Preliminary Economic Analysis
• Preliminary Recommendations
Grain Logistics

Road

Rail

River

Storage

Regulations
Ukraine – Grain Production Increase

Ukraine - Historical Grain Production (million tons)

Source: FAOSTAT

Calendar Year

Marketing year refers to the 12 month period from the beginning of a new harvest. In Ukraine, for wheat and barley it is June 1-May 31; for corn Sep. 1- Aug. 31.
Significant Annual Variability

Ukraine - History of Grain and Oilseed Production

Same data as above

But different perception of annual variability
Challenging Production Forecasts

Ukraine - Grain and Oilseed Production
History and OECD-FAO Forecast (million tons/calendar year)
Since domestic consumption is expected to remain stable, most increased production would be exported.

Sources: APK-Inform for the history, FAO-OECD Forecasts until 2013 (in green) team forecasts for longer term future, Ukrainian Grain Association for potential.
Strong Seasonality of Grain Transport in Ukraine

Ukraine - Seasonality of Railway Grain Transportation Volumes (2013, million t)
Ukrainian farmers receive a small share of export prices

2009-12 Average Farm Gate Prices over World Prices (FOB)

Wheat - Farm Gate Prices as share of World Prices
- USA, 90%
- Canada, 79%
- Kazakhstan, 66%
- Ukraine, 60%

Maize - Farm Gate Prices as share of World Prices
- USA, 95%
- Canada, 91%
- Brazil, 84%
- Ukraine, 68%

Wheat and maize losses compared to USA: $1.6 billion per year
Competition Among Traders

A Competitive Grain Export Market

- Nibulon: 14%
- Topfer Int. (ADM): 12%
- Louis Dreyfus: 11%
- Kernel Trade: 10%
- Serna (Glencore): 8%
- State Grain & Food Corp.: 9%
- Suntrade (Bunge Ukraine): 8%
- Others: 28%

Transfer pricing could be an issue
Partly because of high logistics costs

Wheat marketing costs
(USD/t, 2010)

Note: * - as % of the cost in Ukraine
Source: ISU extension service, open sources

Reducing costs to the level of France/Germany for 10 million tons exported in 2014 would increase efficiency by $200 million per year
Logistics Performance Index (2014)

Overall LPI score

Ukraine

Ukraine

Russia

United States

Turkey

Poland

Latvia

Hungary

Overall LPI score

Timeliness

Tracking and tracing

Logistics quality and competence

International shipments

Customs

Infrastructure

0.0

0.5

1.0

1.5

2.0

2.5

3.0

3.5

4.0

4.5

Germany

United States

Turkey

Poland

Latvia

Hungary

Ukraine

Russian Federation

Romania

Ukraine
Breakdown of Logistics Costs

Wheat/barley from field to elevator to port by railway
(UAH/t)

Source: CTS Survey, November 2014
Cost Comparison: Road, Rail, River

Grain Transport Cost
(Kremenchug to Mykolaiv, US$/t)

Source: Nibulon
Road, Rail and River as Export Shares

Ukraine

USA

Road | Rail | River

16
## Road

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</table>
| • Good road network  
• Flexible management of trucks  
• Easy small investments  
• May small providers of truck services  
• Free infrastructure (good for users, bad for the Government) | • High unitary cost  
• Modern, larger trucks require modern supporting infrastructure (e.g., longer weighing stations)  
• Old truck fleet |

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| • Potential to increase efficiency | • Long term damage to the road network  
• High interest rates and persistent budget deficit makes it difficult to invest |
Exceeding axle load significantly expands truck competitiveness
## Rail

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<tbody>
<tr>
<td>Low unitary cost</td>
<td>One single supplier (UZ Monopoly)</td>
</tr>
<tr>
<td>Good rail network</td>
<td>Challenging organization</td>
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<tr>
<td>Established tradition</td>
<td>Tariffs do not create incentives for private investments</td>
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<td>Seasonal demand for infrastructure</td>
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<tr>
<td>Potential to increase efficiency</td>
<td>Outdated infrastructure requires significant investments</td>
</tr>
<tr>
<td>Technical easy to improve tariffs (if there is political will)</td>
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Outdated Grain Hoppers concentrated in Ukrzaliznytsia

**AGE STRUCTURE OF GRAIN-HOPPERS FLEET, AUG 2014**
- >35: 163
- 0-2: 1391
- 31-35: 3602
- 21-25: 1581
- Average age: 26 years

**OWNER STRUCTURE OF GRAIN-HOPPERS FLEET, AUG 2014**
- Railcar fleet: 13,6 thou units
- Striy railcar repair plant: 939 (7%)
- Private companies: 1859 (14%)
- UZ: 10764 (79%)
- Other
Grain hoppers life extension from 30 to 45 years

Source: CFTS
Tariffs do not stimulate private investments in grain hoppers
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</table>
| - Lowest unitary cost  
- Old tradition | - Unclear public/private roles  
- Outdated infrastructure and management  
- Challenging organization  
- When pick of demand, ion winter, navigation is forbidden |

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</table>
| - Potential to increase efficiency  
- Technical easy to improve tariffs (if there is political will)  
- Deregulation can improve quality of services even without significant investments | - Outdated infrastructure requires significant investments  
- Tariffs and operations create obstacles to private sector |
The River Dnipro is a great opportunity, but with limits

- Low depth
- Outdated, inefficient, and expensive locks and bridges
- High costs of pilotage and use of infrastructure
- Navigation is forbidden when river freezing is a risk
- Protectionist policies do not allow international fleet to compete
The river is closed during the pick of demand

The Dnieper River freezes in winter

But administrative closure could be more flexible
A potential benefit of climate change?

Ukraine - Average Annual Air Temperature Deviation from the Norm
(Period: 1961-2012. Norm = +8 Centigrades)
### Storage

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<tr>
<td>• Network of 1,200 warehouses distributed across the country</td>
<td>• Storage capacity only for half annual production</td>
</tr>
<tr>
<td>• 27% of these are independent</td>
<td>• 46% flat/floor storage</td>
</tr>
<tr>
<td>• Competitive service provision</td>
<td>• Outdated complementary infrastructure: loading/unloading equipment, drying, testing, weighing stations</td>
</tr>
<tr>
<td>• High turnover in private elevators</td>
<td>• Low turnover in state owned elevators</td>
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<tr>
<td>• Production increase will drive the need for quality storage</td>
<td>• Limited private sector investment capacity</td>
</tr>
<tr>
<td>• High rate of return in ports create incentives for the development of port infrastructure</td>
<td>• Low rate of return, particularly close to production</td>
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Grain Storage

Storage capacity: **41 million tons**, or 56% of the 2013 production

- 33.5 m tons certified - requirement abolished in 2014 - and **ESTIMATED 7.5 uncertified**

Storage includes complementing infrastructure:

- Testing
- Weighing stations
  - Many cannot handle trucks of more than 30 tons, while modern trucks reach 60
- Drying
  - Inefficient outdated equipment (12% cost of corn drying)
- Loading and unloading equipment:
  - Modern equipment can load a train of 54 hoppers in one day
  - Flat storage can take 10 days to load the same train. This blocks 54 hoppers for 9 days
Ports

... but port fees in Ukraine are 1.7 times higher than in Germany or France, and 2.3 times higher than the USA.
## Preliminary Suggestions

<table>
<thead>
<tr>
<th>Roads</th>
<th>Railways</th>
<th>Rivers</th>
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<tbody>
<tr>
<td>Effective Road Asset Management (axle load enforcement and restriction control)</td>
<td>Grain hoppers overhaul to extend life from 30 to 45 years</td>
<td>Dredging the Dnipro River</td>
</tr>
<tr>
<td>Investments in access roads and facilities in ports</td>
<td>Differential railway tariffs to stimulate private sector ownership of hoppers</td>
<td>Improvement of river infrastructure operations</td>
</tr>
<tr>
<td>Invest in key corridors</td>
<td>Seasonal railway tariffs to stimulate investments in storage and reduce seasonality</td>
<td>Expansion of river fleet (including by facilitating entrance of foreign vessels)</td>
</tr>
<tr>
<td></td>
<td>ICT (Tracking and tracing system)</td>
<td>Flexibility in the operation calendar</td>
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<td>Worth considering ice-brakers?</td>
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## Preliminary Suggestions

<table>
<thead>
<tr>
<th>Storage</th>
<th>Regulation</th>
<th>Institutions</th>
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</thead>
<tbody>
<tr>
<td>Facilitate private sector investment in elevators (including efficient dryers, weighting stations, loading and unloading, testing facilities)</td>
<td>Customs, Labs to work 24/7 during peak season</td>
<td>Create a National Agro-logistics Council, composed of reps of Min Agri, Min Infra, key stakeholders to prepare and implement an National AgroLogistics Strategy</td>
</tr>
<tr>
<td>Increase efficiency of State Owned Elevators (possibly by privatizing them)</td>
<td>Paperless declaration, making possible to submit documents online</td>
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<tr>
<td>Improve availability of information on storage</td>
<td>Elimination of duplicated quarantine, veterinary, and GM Certificates</td>
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## Preliminary Attempt of Economic Analysis

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<th>River</th>
<th>Railway</th>
<th>Grain Storage</th>
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<tr>
<td><strong>Direct benefits</strong></td>
<td>7 million tons of grains transported by rivers by 2022</td>
<td>10 million tons of export grains transported at lower railway tariff by 2022</td>
<td>Storage capacity of new elevators increases by 6.4 million tons Up to 0.6 million tons of grain saved from loses every year</td>
</tr>
<tr>
<td><strong>Estimated investments (public / private)</strong></td>
<td><strong>USD 570 million</strong>&lt;br&gt;• rivers dredging (public)&lt;br&gt;• river grain terminals (private)&lt;br&gt;• barges (private)&lt;br&gt;• public incentives: river tariff optimization, tax exemption, etc.</td>
<td><strong>USD 640 million</strong>&lt;br&gt;• grain hoppers (private)&lt;br&gt;• public incentives: tariff optimization, tax exemption, etc.</td>
<td><strong>USD 1,500 million</strong>&lt;br&gt;• grain elevators&lt;br&gt;• public incentives: tax exemption, etc.</td>
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Conclusions

• Ukraine is a major grain exporter with potential to continue growing
• The agricultural sector proved to be particularly resilient even during the current crisis
• Significant investments in infrastructure are needed to improve efficiency of agro-logistics (US$4-6 billion)
• However important improvements can be achieved even by regulation improvement with limited investment and quick returns
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