Perspectives for individual livestock farms in post-Soviet agriculture – Evidence from Kazakhstan

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Kazakhstan’s Livestock Evolution

- First dip: after the First World War and the Russian Civil War
- Second dip: collectivization under Stalin
- Third dip: livestock transfer and liquidation following the collapse of the Soviet Union

(Sources: National Statistics Agency; Ciclit 1995)

Policy Questions

- What are the factors leading to livestock herd expansion?
- Is the use of communal land associated with lower animal productivity?
- How can policy increase productivity and improve efficiency?
- How can HHs develop into larger, more efficient commercial units?

Post-Soviet Transition and Recovery

- Kazakhstan’s initial livestock decline was among the largest in the former Soviet Union.
- Grain production by large agricultural enterprises (AE) was encouraged; only recently did production by AE be promoted.
- Livestock recovery during the 2000s suggests initial herd liquidation was excessive.

- Livestock recovery was led by smallholder households (HH), now averaging 2.8 cattle and 12.8 sheep and goats in the study area.
- HHs could absorb much of livestock liquidated by AEs using communal rangelands (free, open-access grazing lands near villages).
- Herd size on each registered family farm or ‘peasant farm’ (PF) has been increasing.

Data

- 2012 IAMO farm survey in Almaty and Akmola Oblasts, Kazakhstan
  - AE: agricultural enterprises (n=55)
  - PF: peasant farms (n=245)
  - HH: households (n=300)

- Proportion of farms that use communal range
  - AE
  - PF
  - HH
  - Almaty: 40% 26% 75%
  - Akmola: 41% 70% 82%
  - Only 10 producers use ranges 15+ km away from village

- Average # cattle per farm
  - 2008: 426.463
  - 2011: 64.78
  - Increase: 3.2 2.8

- Cow milk yield (kg/cow/year)
  - AE: 2,543
  - PF: 2,207
  - HH: 1,659

- Proportion of farms that increased herd size between 2008 and 2011
  - Almaty: 100% 72% 49%
  - Akmola: 68% 55% 19%

Conclusions

- Village dummies are included to control for climate and other location specific factors.
- Lower cow milk yield on communal land in Almaty Oblast.
- Hay has higher marginal product on communal range.
- Farms with larger herds achieve higher milk yields.

- Initially larger herds tended to expand for PF and in Akmola Oblast.
- Older PF operators tended to reduce herd size.
- Communal range users tended to expand herds.
- Trained HH tended to reduce herd size.
- Higher probabilities of herd expansion for: Almaty producers
- PF producers

Selected Regression Results

- Cow milk yield function
  - Independent variables
    - (Unit) Coeff
    - Almaty x communal range use
      - (0/1) -547.327
    - Log (hay per head)
      - (kg) -20.907
    - Hay/head x communal range
      - (kg) 0.164
    - Fodder per head
      - (kg) 0.920
    - Fodder/head x communal range
      - (kg) -0.804
    - Concentrate per head
      - (kg) 0.322
    - Log (all livestock in 2011) (head)
      - (20.413 R²)
      - N 232
    - + p<0.05; ++ p<0.01

- Herd expansion behavior
  - Dependent variable: 1 if grazing livestock increased during 2008-11
  - Independent variables
    - (Unit) PF HH Alm Akm
    - Log (grazing livestock in 2008) (head)
      - (year) + - + +
    - Operator age
      - (years) - + - +
    - 1 if use communal range (0/1)
      - + + + +
    - 1 if agricultural education (0/1)
      - + - - -
    - 1 if Almaty (0/1)
      - + - + +
    - 1 if PF (0/1)
      - + - - +
    - N 102 125 84 164
    - + p<0.05; ++ p<0.01 (AE farms are excluded from the regressions)