



SCIENCE BRIEF 3

Livestock sales in the face of harsh winter shocks: evidence of poverty traps in rural Kyrgyzstan

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Summary

Livestock sale has long been considered a coping strategy for rural households in drought, but there is no evidence of a setting where shocks emerge from severe winters. This article focuses on the exceptionally harsh winter days that Kyrgyzstan experienced in 2012 and extreme winter days in other years to analyze how livestock owners responded to the shock. We use nationally representative panel data from Kyrgyzstan and geo-referenced daily temperature data. This science brief summarises results from a fixed effect regression that documents a heterogeneous household response to harsh winter days consistent with a poverty trap. Wealthy households sell their animals to smooth consumption, while low-income families soft assets, although asset smoothing can be painful for poor households regarding current consumption. Policymakers should take this evidence of a poverty trap as a basis for designing shock mitigation policies with less hardship for needy families.

Background

Ainura, 48, a widow with three children, lives in the Issyk-Kul region of Kyrgyzstan. When her husband died, she sold their only cow and spent the money on her husband's funeral. After that, she could not afford another cow. As a result, she suffered from chronic food shortages, as her family depended on the cow. Thus, she fell into years of poverty from which she could not recover and spent many years in poverty. Ainura claims that the cow is vital for escaping the poverty trap. Epitomizing the example of Ainura's case cited above, we explore the role of livestock as a survival mechanism during harsh winters in Kyrgyzstan. Using country and region-representative data, we summarise our findings on heterogeneous coping strategies for poor households consistent with a poverty trap documented in Sultakeev and Petrick (2023). According to Figure 1, an asset-rich household can be expected to reduce assets in the face of harsh winter days by smoothing consumption to have stable consumption during shocks. However, asset-poor families may decide to protect (smooth) their assets to avoid the same fate as Aynura. Fearing long-term poverty, households value the future economic value of scarce livestock higher than the current smoothing cost of consumption (Carter & Lybbert, 2012) Given the heterogeneous geography of Kyrgyzstan, we discuss the measurement of "harsh winter" and use an essential indicator of adverse temperature shocks at the village level in an understudied region. It is defined as the number of days in a village when the average daily temperature is below a threshold defined by the long-term average for the town minus one standard deviation to capture the actual cold days that farmers experience for the first time in their villages. We estimate a fixed effects panel data model of emergency livestock sales at the household level and test it for different regimes of asset ownership.

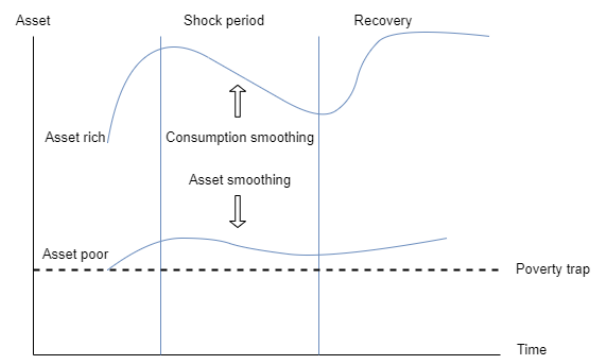


Figure 1. Consumption smoothing and asset smoothing and poverty trap in the event of a shock adopted from Carter et al. (2007)

Methodology

We employ nationally representative "Life in Kyrgyzstan (LiK)" panel data from 2010 to 2013 and 2016 and merge it with daily temperature observations using NASA data for 120 communities (villages) in Kyrgyzstan. Observing a cold winter shock during the LiK data collection and the availability of livestock sales data and daily temperature data allow us to study the impact of severe winter days on livestock sales. By measuring the "harsh winter" days, we have developed a new indicator of harmful temperature spikes at the village level. We evaluate a fixed-effects panel data model of emergency livestock sales at the household level and test it for different asset ownership regimes. Moreover, we demonstrate the empirical evidence of other survival mechanisms, especially the ownership of assets such as land or vehicles and the existence of migration networks. To measure cold winter, we use several methods. We follow the methodology of Fafchamps et al. (1998) and Hoddinott (2006), which suggest using annual temperature or precipitation deviations from historical averages to sell their livestock to cope with the shocks. Moreover, we partially follow the methodology of Dellet al. (2014) and Otrachshenko & Popova (2022) to calculate the number of severe winter days.

Results

Findings show that households with assets above the threshold increase their livestock sales by \$31 due to severe winter shocks. At the same time, there is no evidence that households below the threshold are liquidating their animals to smooth consumption. We thus contribute to the existing literature by examining the poverty trap hypothesis in a new setting: the response of poor livestock owners to adverse temperature impacts in Central Asia. This is the first study of the poverty trap hypothesis in Central Asia. It sheds light on the behavior of asset smoothing for asset-poor households and consumption smoothing for asset-rich households. It shows wealth-based smoothing regimes during severe winter shocks, showing different responses depending on household wealth. Wealthier households sell animals to mitigate harsh winter conditions, while poorer ones prioritize protecting livestock for asset stability. Moreover, the results show that remittances and social obligations are vital factors of household liquidity in influencing responses to severe winter shocks. This empirical evidence suggests qualitatively different smoothing regimes, confirming a wealth-mediated response to shocks in our Central Asian setting. The asset protection strategy is consistent with Ainura's fate, showing that shocks create hardship for low-income people and ruin them if they sell their only livestock. It implies the existence of a minimum asset base below which asset accumulation is impossible, leaving poor farmers like Ainura stuck in a poverty trap for many years.

This finding is consistent with literature from developing countries, including Carter & Lybbert (2012) and Balboni et al. (2022).

Recommendations

Our five-year panel analysis defines an asset smoothing strategy among households with low assets, suggesting that poor households protect their productive resources to obtain a stable income in the future. In contrast, livestock sales play a significant role in smoothing consumption for asset-rich households who own more than one cow. These results are consistent with a poverty trap: wealthy households sell their animals to smooth consumption, while poor households protect a (smooth) asset. However, asset smoothing can be painful for poor households regarding current consumption. Policies that cushion shocks today can bring significant benefits in the long run. Our research shows that these measures were insufficient to eliminate unequal asset ownership's harmful effects. Given Kyrgyzstan's lack of public finance to deal with shocks, international donors can play their part in designing and funding schemes that will insulate rural people like Ainura from future hardships.

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Reference

Balboni, C., Bandiera, O., Burgess, R., Ghatak, M., & Heil, A. (2022). <https://doi.org/10.1093/qje/qjab045>
Carter, M. R., Little, P. D., Mogues, T., & Negatu, W. (2007). <https://doi.org/10.1016/j.worlddev.2006.09.010>
Carter, M. R., & Lybbert, T. J. (2012). <https://doi.org/10.1016/j.jdeveco.2012.02.003>
Dell, M., Jones, B. F., & Olken, B. A. (2014). <https://doi.org/10.1257/jel.52.3.740>
Hoddinott, J. (2006). <https://doi.org/10.1080/00220380500405501>
Otrachshenko, V., & Popova, O. (2022). <https://doi.org/10.1111/roiw.12532>

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