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# DOES EXPORT SUPPORT HOUSEHOLD INCOME IN MONGOLIA?

Case  
Study

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## Keywords

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Meat export;  
Herder households;  
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## JEL Classification

*Q01, P46, Q17*

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## Abstract

*Livestock production is a traditional activity in Mongolia that accounted for 10 percent of the national economy in 2019. During the last decade, the number of livestock has doubled; however, this has not improved the poverty levels of herder households which are still high. Higher numbers of livestock have meant higher levels of income for the herders. The objective of this study was to investigate the impact that meat export had on herder households' livelihood. Meat is the second most important cash income source for herder households and is one of the major export items of the livestock sector. The results of the study show that current meat export does not adequately support herder households' income levels. This is explained by the lower export price of meat and the limited direct involvement of herders during the meat export. In conclusion, the government should promote herder's involvement in meat export through rural cooperatives or other arrangements, in order to bring more benefit from the meat trade to the livelihood of herder households.*

## INTRODUCTION

Livestock production is a longstanding traditional activity in Mongolia, and the sector is still playing a crucial role in the national economy. The number of livestock has reached its record of 66.5 million heads in 2018 after a big loss of 10.3 million heads due to dzud disaster (very harsh winter) in 2009 (NSO, 2019). Like in most agriculture-based countries, socio-economic and ecological developments are inextricably linked in Mongolia. Although the number of livestock has been increasing, the herder poverty rate is still higher than the national average of 28.4 percent; and the herder poverty index was 30.8 percent in 2018 (NSO, 2019). Herder households with less than 200 livestock make up 43% of the total number of herder households, while their herds account for only 12% in the total number of livestock (FAO and MoFALI, 2018). Generally speaking, the income from 200 heads of livestock is insufficient to feed an average rural family of four, though the number deviates with regards to the herds' composition. Furthermore, high poverty levels drive herders into less sustainable resource utilization patterns, such as: limited (or no) seasonal mobility of livestock, out-of-season grazing, and the preference for resistant but ecologically more harmful livestock species such as goats. According to the latest research, 65% of the rangeland of Mongolia is degraded to some extent, though this varied by ecological zone (FAO and MoFALI, 2018).

Meat is one of the major export products from the livestock sector in Mongolia, and it provides 39.0 percent of annual cash income, a fact that makes it the second largest source of cash income from herder households' production after cashmere (SDC and MMCG, 2017). With efforts to facilitate trade agreements and support the development of partners with the strengthening of national policies, the Government of Mongolia and the private sector have made progress in increasing meat export during recent years. For instance, meat exports of Mongolia have been increasing rapidly since 2014 and in 2018 they reached their highest level in twenty-eight years. Mongolia has earned USD 160 million from 54,900 tonnes of meat exports in 2018. Two neighbouring countries, Russia and China, provide a geographically favourable and massive market, e.g. more than 70 percent of Mongolia's meat is exported to China (Customs Office Mongolia, 2018).

Model-based projections of China's meat imports suggest they may rise sharply by 2030 (Wu Sheng & Li Juan, 2015). Mongolian livestock is raised with non-genetically modified organism feed, they are allowed to roam the vast steppe, and are slaughtered humanely. Thus, Mongolian meat has a strong brand potential that, if properly developed,

may allow it to become a well-respected international player; and some international customers will pay a higher price for this valuable product (Danforth & Dash, 2017).

The authors believe that meat exports support could increase herder household's incomes that might lead to limiting the number of livestock, providing an environmentally acceptable threshold level for sustainability. The research objective was to investigate meat exports' impact on herder households' livelihood in Mongolia. The article is organized as following: after this introductory part, the materials and methods section includes a theoretical framework, data collection, model specification and descriptive statistics. The part "*Results and Discussion*" is describing model results and the article ends with "*Conclusions*" supported by the research findings.

## MATERIALS AND METHODS

### Theoretical framework

According to the trade theory pioneered by David Ricardo and Adam Smith, two countries trade and get a mutual benefit based on their comparative or absolute advantages (Lang, 2011). Alan Winters (2006) declared that several well-known global cross-country studies argued that trade was good for growth.

Livelihoods include the capabilities, assets, income and activities that people require to ensure that their basic needs are covered. A livelihood is sustainable when it allows people to cope with and recover from setbacks and stresses (such as natural disasters, and economic or social upheavals) and improve their welfare, and that of future generations, without degrading the environment or natural resources base (Chambers & Conway, 1992).

A framework developed by McCulloch, Winters, & Cirera, (2001) illustrates how changes in trade are transmitted through to households using three channels: distribution, enterprise and government. From this framework, one can see how changes in trade can offer considerable opportunities to poor households; but they can also increase the vulnerability of poor traders, producers and consumers, and have short- or medium-term adverse impacts (Figure 1) (Higgins & Prowse, 2010). Changes in trade, derived from trade openness, can affect households directly, through the distribution channel. This channel primarily relates to the prices of goods and services. Changes in trade can affect households through the enterprise channel, which comprises profits (export incomes), wages, and employment. Changes in trade will also affect households through changes in taxes and transfers (policy). For example, changes in trade tariffs, from which governments

derive the revenue, may affect the volume of government spending on critical economic and social investments, such as: infrastructure, health, education, sanitation, and social protection. Across these channels, a range of *household-related factors* will influence the ability of households (and individuals within those households) to respond to opportunities that emerge as a result of changes in trade and cope with adverse impacts that result from changes in trade.

### Data and Model Specification

The study used twenty-two years' (1997-2018) time-series data gathered from the National Statistical Office, and the Customs Office of Mongolia. The unit of income and price data were converted into USD (from the national currency of tugriks) using the annual nominal exchange rate of the Central Bank of Mongolia.

Using the dataset, the following relationship was estimated within the theoretical framework of the study:

$$\ln Y_t = \alpha + \beta \ln X_t + \varepsilon_t, \quad \text{for } t = 1, \dots, 22 \quad (1)$$

Where:

$Y_t$  = Herder household income per month of year  $t$ ;

$X_t$  = Set of independent variables in year  $t$ ;

$\varepsilon_t$  = Error term with standard properties

A log-log regression model was estimated, using SPSS through standard econometrics procedures, in order to determine the above. The log-log regression model was selected in order to generate the desired linearity in parameters (Field, 2005; Verbeek, 2008). Monthly herder household income was selected as a dependent variable and independent variables are the following: urban household income, export of livestock sector, number of livestock, export price of beef, export price of horse meat, export price of sheep goat meat and average sheep meat price on the domestic market.

### Descriptive statistics

Table 1 provides the descriptive statistics of the variables selected for the model, and the texts in the table explain the current state of each variable. The dependent variable was the monthly income of the herder household. The richest herder household's monthly income was USD 534 per month, while the poorest herder household earned USD 55 per month, in the sample. The average income of a herder household was USD 256 throughout the period.

The variable "*Per Day \$*" refers to the "*income per average day, per household*". The average herder household had 3.4 people (NSO, 2019). Thus, the per capita income amounts to USD 2.5 / day, which is barely above the poverty line. In the years with

the lowest income, the income was as low as USD 0.5 / day.

The average monthly income of urban households was USD 318 – 1.2 times higher than the one of herder households. Urban household income was higher than the herder household income at all levels. According to the statistical data, there was no significant difference between the herder and urban households' monthly income in the first decade of the study period, but the differences became greater after the 2009-2010 dzud years. Both herders and urban households' monthly income have been increasing (NSO, 2019).

The average value of exported livestock products was USD 33.1 million a year, and in 2018 (with the export of meat increasing) it reached the highest level of USD 102.1 million. Several sharp decreases in meat exports are explained by the occurrence of infectious diseases such as foot-and-mouth disease (Figure 2), and bordering countries' trade and non-trade tariffs and regulations are all limiting the export of meat from Mongolia.

The overall trend of livestock numbers has been an increase, though with sharp declines during the course of two dzud (very harsh winter) periods, i.e. 1999-2002 and 2009-2010. The total losses were equal to 9.9 million in the first period and 10.3 million in the second.

The average export price of beef was USD 2.0 / kg in the selected time period of 22 years. The export price of sheep, goat and beef were similar, but the export price of horse meat is relatively lower than others. Export prices vary somewhat according to the type of meat and to the country of export. Beef is mostly exported to Russia and Kazakstan, while horse meat is exported to Russia and China. The majority of sheep meat is exported to Iran and Vietnam, followed by Hong Kong and China (Customs Office Mongolia, 2018).

Domestic meat price is slightly lower than beef, sheep and goat meat price while higher than horse meat in some exception. Meat prices are significant for: herders' income, meat production, and exports (NSO, 2019).

## RESULTS AND DISCUSSION

The estimation results of applying the log-log regression model described by relationships in equation (1) to the current dataset are presented in Table 2.

The herder household's income, as a dependent variable, depends highly on urban households' income. The income increase of herder households could explain the positive relationship between herder and urban household income through meat sales income.

The variable number of livestock has a positive, significant impact, as expected. Logically, more

livestock would bring more income to herder households. As noted in the introduction, rangeland carrying capacity should be a limiting factor for the number of livestock.

Interestingly, a high level of export volume (and price) does not support herders' households' income. Export volume and prices (beef, sheep, goat) are significantly and negatively related to herder households' incomes. This might be related to the fact that herders are not directly benefiting from export income. Gains from meat exports go to the exporting agents at the upper-level of the meat value chain. In addition to this, meat producers have less interest in exporting meat if the domestic price is the same (or higher) than the export price. Currently, Mongolian meat export average price is four times lower than Australian and New Zealand meat export price on the Chinese market.

Domestic meat prices positively impact changes of herder households' income. This is in line with basic economic theory, where price increase stimulates the supply and producer income.

The dummy variable "T" is significantly and positively related with herders' households' income. That means that if herders' income is increasing from year to year, one of the reasons for that can be the government policy to support herders' livelihood. Explanatory variables "Export of livestock product" and "Price of horse meat" are not significant.

## CONCLUSIONS

Although government policy has supported the increase of meat exports during the last years, it has not supported herders' income. Herder household is not an exporting body as its income directly relates to the domestic market price rather than the export. The current level of the domestic meat price is nearly the same as the meat export price. In this case, exporting agencies would also have a strategy to approach domestic market.

Concerning sustainability, the Government of Mongolia continues to support meat trade since the number of livestock far exceeds the rangeland's carrying capacity. The priority for export should be given to sheep and goat meat, with regards to meet a balanced herd composition. Meat export policy should support high quality, high price meat export rather than the low value of a higher quantity. The main conclusion is that the government should promote herder's involvement in meat export through rural cooperatives or other arrangements, in order to bring more benefit from the meat trade to the livelihood of herder households.

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**TABLES**

Table 1  
**Descriptive statistics**

Variable	Unit	Min	Mean	Max	Median	Std. deviation
Income herder household	\$ per month	55.3	256.2	533.6	223.9	157.8
Per Day \$	Day	1.8	8.5	17.8	7.5	5.3
Income Urban Households	\$ per month	70.4	318.0	684.7	273.3	213.8
Export Liv. Product	Million \$	16.5	33.1	102.1	26.02	21.0
Total livestock number	Million heads	23.9	40.1	66.4	35.6	13.0
Export price Beef	\$ per kg	0.9	2.0	3.4	1.8	0.9
Export price Horse meat	\$ per kg	0.4	1.5	3.3	1.5	0.8
Export price Sheep Goat	\$ per kg	0.7	2.2	7.0	1.8	1.6
Average domestic meat price	\$ per kg	0.7	2.0	4.4	1.9	1.1

Table 2  
**Regression results**

Variables	Explanation	Coefficient	t Stat
Dependent variable: Ir	Monthly income of herder household		
Iu	Urban household income	<b>0.6638***</b>	3.8676
ExportL	Livestock product export	-0.0662	-0.8388
Livestock	Number of livestock	0.2037**	2.1225
PxBeef	Export price beef	-0.4576**	-2.3866
PxHorse	Export price Horse meat	0.0246	0.1444
PxSheep Goat	Export price Sheep Goat meat	-0.1565**	-1.8964
PDm	Average domestic market meat price	<b>0.5578**</b>	2.2970
T	Time	0.0207*	1.6988
Adj. R Sqr.	Adjusted R Square		0.928
Obs.	Number of observation year		22

Notes: \*, \*\*, \*\*\* indicate 10%, 5%, and 1% significance level respectively.

Source: Estimation results

**FIGURES**

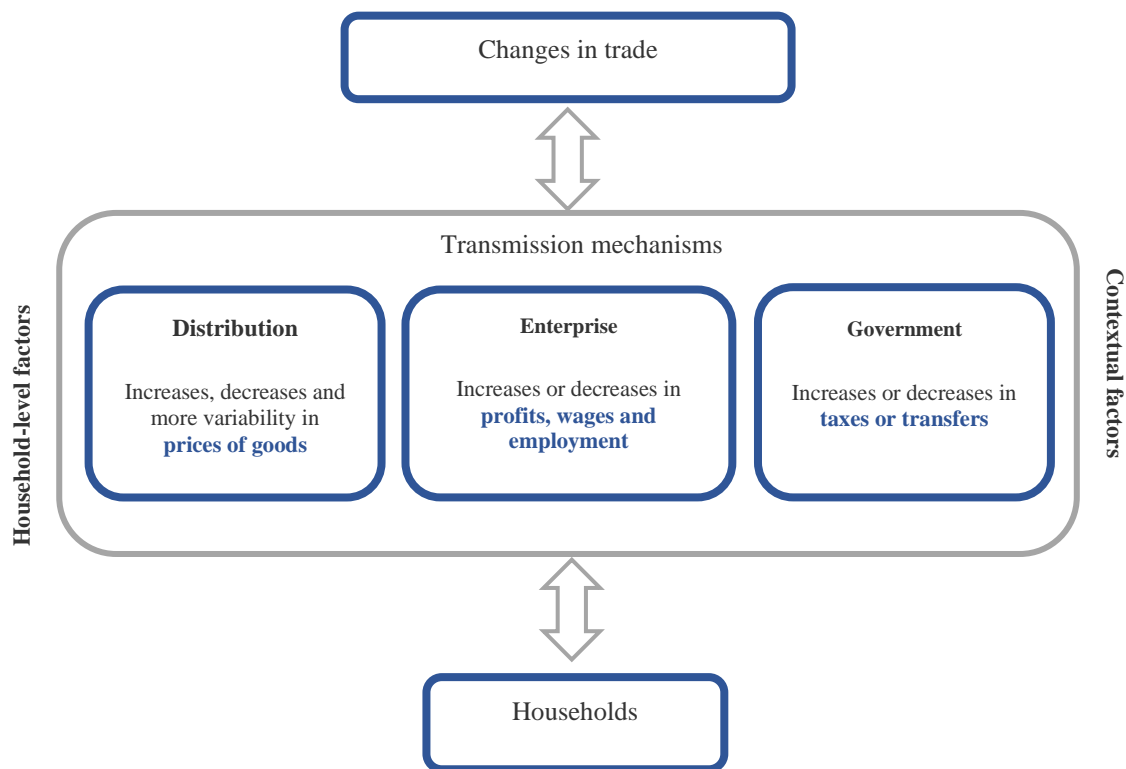


Figure 1  
**Mechanisms transmitting changes in trade through to households**  
 Source: (Higgins & Prowse, 2010)



Figure 2  
**Livestock number (million heads) and meat export (thous. tonnes)**  
 Source: Customs Office Mongolia (2018);(NSO, 2019)