Gerelmaa (Maya) Batjargal

Dr. Zhen Li

FURSCA End of Summer Report

Summer 2024

Landlocked Developing Countries Trade Policy Analysis

Landlocked developing countries (LDCs) face significant challenges, such as high transport costs and limited market access due to their lack of direct access to oceans. In this project, I aimed to explore these specific challenges, using Mongolia as a case study. By examining Mongolia's experiences, I hoped to uncover patterns, trends, and best practices that can inform policy decisions and support sustainable economic growth in similar countries worldwide.

The analysis focuses on Mongolia, using its indicators as a baseline for comparison with other landlocked developing countries. Specifically, the study examines the inflation rate, import and export volumes, gross domestic product (GDP), total foreign trade volume, the percentage of total world trade, and tariffs for these countries between the 1990s and 2023. The analysis employs both the gravity model method and case analysis method to understand these dynamics. The gravity model method is particularly useful for assessing trade flows between countries based on their economic size and distance from one another. In total, the study considers 32 developing landlocked economies to formulate optimal policy recommendations.

To assess the diversification of a country's export portfolio, I employed the diversification index, which evaluates the variety and distribution of products exported to different markets. This metric helps us understand whether a country's export earnings are dependent on specific commodities or if they come from a broader range of products.

The Herfindahl-Hirschman Index (HHI) is a key measure of export concentration within a country's portfolio. It's calculated by summing the squares of the market share of each product category:

$$HHI = \sum_{i=1}^{N} (MS_i)^2$$

HHI = (Market share$_1$)² + (Market share$_2$)² + ... + (Market share$_N$)²

Using this formula, I was able to evaluate export diversification among landlocked developing countries. This analytical approach provides valuable insights into diversification levels and reliance on specific products within these economies, which can inform the crafting of effective economic and trade policies.
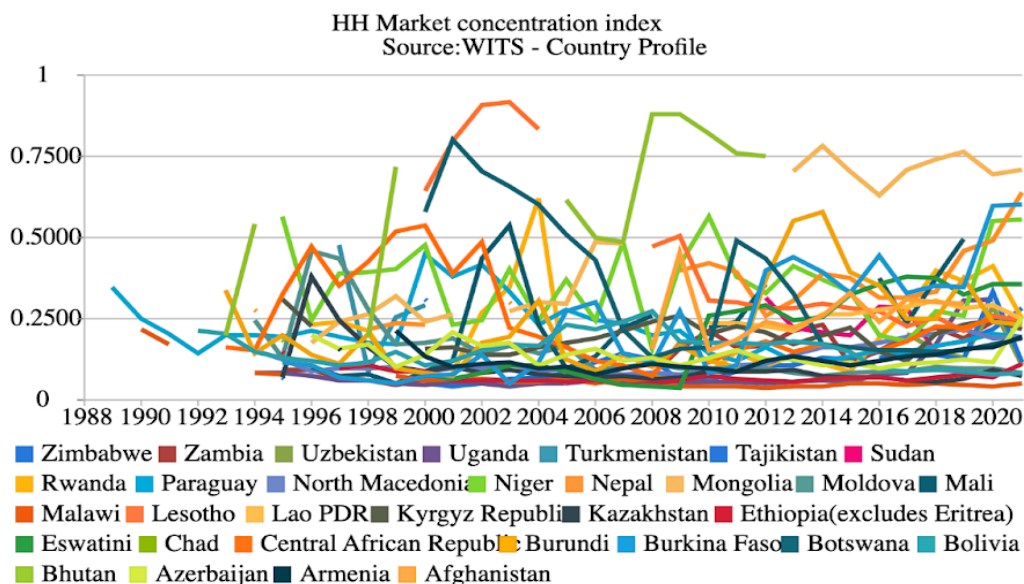
Figure 1: *Herfindahl-Hirschman Market concentration index*

A higher Herfindahl-Hirschman Index (HHI) value indicates less diversification and a higher concentration of exports in the product sector. By calculating the index, we can assess the level of export diversification of a country. If the index value is low, it signifies high diversification. Conversely, a higher index value demonstrates a more concentrated export portfolio. For landlocked developing countries, the HHI is typically high, indicating low export diversification. These countries have adopted a geographically specific export diversification strategy, focusing on the final processing stages of leading raw materials. By trading these materials as manufactured products, they aim to enhance market access and add value, thereby increasing the benefits of exports.

The pronounced values of both the Herfindahl-Hirschman index (HHI) and the product diversification index (PDI) around 0.60-0.75 signal a lack of diversity in Mongolia's export portfolio. This concentration indicates a heavy reliance on a limited number of products for export earnings. Such dependency underscores the vulnerability of Mongolia's economy to fluctuations in these specific products, highlighting the urgent need for strategic efforts to broaden the export base and mitigate potential risks associated with overreliance on existing sources of export revenue.
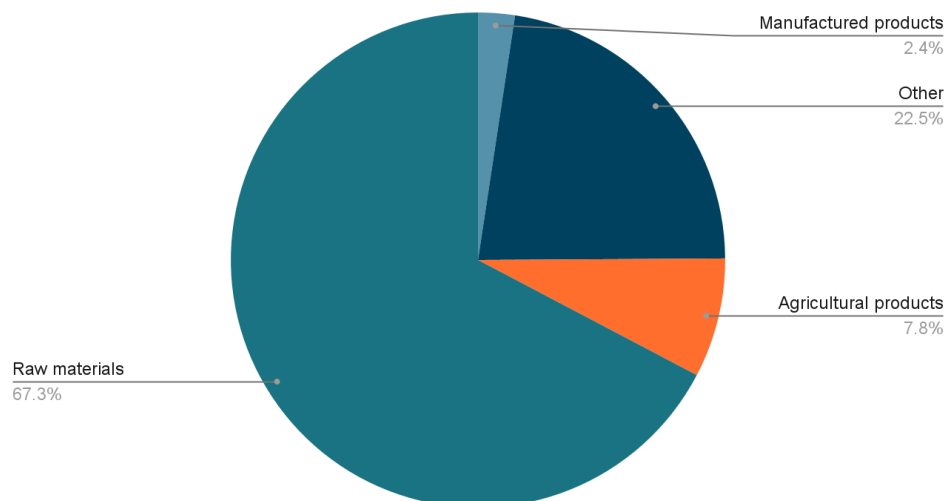
Figure 2: *Mongolia's total export portfolio*

Mongolia's total exports account for 0.04% of the world's total exports, with a significant portion, 67.3%, deriving from the mining of raw materials such as coal, copper, and gold. These resources form the backbone of Mongolia's largest export industry and play a crucial role in driving the country's economic growth and development.

Gravity Model Evaluation

Here, I used the gravity model method to evaluate various inter-country trade flows. Calculations were made to assess the influence of several factors, including the distance between countries, regional trade agreements, and membership in the World Trade Organization (WTO). Additionally, variables such as whether the countries are located on the same continent were evaluated.

$Trade_{ij,t} = A(\beta_0 + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} + \beta_3 CONTI_{ij} + \beta_4 WTO_{(ij,t)} + \beta_5 lnDIST_{ij} + \beta_6 RTA_{ij,t}) + \varepsilon_{ijt}$

(GDP_{it}) = GDP of country i during period t.
(GDP_{jt}) = GDP of country j during period t
($CONTI_{ij}$) = Whether countries i and j appear together in a single number.
($WTO_{ij,t}$) = Membership of countries i and j in the World Trade Organization at time t
($DIST_{ij}$) = Distance between countries i and j.
($RTA_{ij,t}$) = Whether countries i and j were involved in a trade agreement during period t.

Dependent Variable: LN_TRADE
Sample: 2005 2023
Periods included: 19
Cross-sections included: 10
Total panel (balanced) observations: 170

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_IMGDP	0.461531	0.058675	3.608272	0.0122
LN_EXGDP	0.792474	0.238445	1.000011	0.1934
LN_DISTANCE	-0.104875	1.977492	-0.285735	0.0000
WTO	0.385950	0.257690	3.295875	0.0000
RTA	0.739575	0.836194	0.495753	0.0000
CONTI	6.495803	0.729572	5.028586	0.0000
C	-19.90685	12.57392	-2.29586	0.4055
Root MSE	1.395865	R-squared		0.395755
Mean dependent var	6.395867	Adjusted R-squared		0.305860
S.D. dependent var	2.459568	S.E. of regression		1.395868
Akaike info criterion	5.398575	Sum squared resid		94.39575
Schwarz criterion	3.506865	Log likelihood		-86.03175
Hannan-Quinn criter.	2.969694	F-statistic		49.53058
Durbin-Watson stat	1.000684	Prob(F-statistic)		0.000000

Figure 3: *Gravity Model Evaluation*

Regional Trade Agreements (RTAs) help increase trade, with a positive effect measured at 0.739575. These agreements often include features like zero tariffs and harmonized regulations. Their goal is to make trade easier and more attractive by giving special treatment to member countries. By reducing barriers, RTAs encourage more trade between the countries involved.

The accession of two countries to the World Trade Organization (WTO) has a positive effect on trade, measured at 0.385950. The WTO is an international organization based on rules and principles agreed upon by its member countries. It influences trade patterns by providing a structured system for conducting trade. Joining the WTO often leads to trade liberalization and better market access, which helps improve the flow of trade. This increased participation can significantly enhance trade contributions between member countries.

Having countries on the same continent has a positive effect on trade, with a strong impact measured at 6.495803. Landlocked countries typically import and export goods by land, engaging in trade primarily with other countries on the same continent. Geographic proximity and shared regional characteristics enhance trade cooperation and integration among these countries, making it easier for them to sell products and conduct foreign trade with each other.

The distance between two countries has a negative effect on trade, with an impact measured at -0.104875. This means that greater distances reduce the flow of trade between countries. The higher this variability, the stronger the negative effect of distance on trade interactions. Conversely, a lower value for this variable indicates that distance has less impact on trade flow.

Considering these factors within the framework of the Gravity Model helps us understand the determinants of trade flows and their impacts. The results of this analysis provide a quantitative assessment that contributes to understanding the complexities of international trade. This understanding is crucial for policymakers and researchers in trade and economics, as it aids in

developing policies to support government integration and promote more efficient and effective trade practices.

CONCLUSION

Several key lessons can be learned from Mongolia's experience:

1. Diversification of Trade Products: Mongolia's trade policy shows the importance of diversifying export products. Relying heavily on a few products can make a country vulnerable to price changes and market shocks. By diversifying and expanding the export base, countries can reduce risk and increase economic stability.

2. Optimal Tariff Policy: Mongolia's tariff policy highlights the importance of having a balanced tariff structure. Finding the right balance between protecting domestic production and making trade easier is crucial. A clear and predictable tariff system that follows international standards can create a good business environment and attract foreign investment.

3. Supporting Domestic Firms: Promoting competitiveness and trade requires supporting domestic firms. Governments can provide resources for industrial growth, invest in infrastructure, and offer access to finance, training, and technical assistance. This helps create a strong domestic business sector that contributes to trade.

4. Investing in Technology Research: Investing in technology research and innovation is essential. Mongolia's example shows the importance of fostering research and development. By improving productivity and product quality, and gaining a competitive edge, countries can achieve economic growth and strengthen their position in global trade.

By including these key issues in their trade policies, countries can create a supportive environment for diversification, trade facilitation, and domestic production development and innovation. However, it is crucial to develop these strategies based on the unique strengths and opportunities of each country, considering specific conditions and challenges. Effective implementation and long-term success require continuous evaluation, adaptation, and cooperation with relevant stakeholders.

Participating in FURSCA has been a rewarding experience, allowing me to work on real-world problems independently. As an Accounting major, this opportunity was essential for improving my skills in analyzing financial data and finding practical solutions. Through my research, I gained a better understanding of the economic challenges faced by landlocked developing countries, focusing on Mongolia. I learned to interpret complex economic models and data, which is important for creating strategies to support sustainable economic growth. I am very grateful to the Bethune Fellows Student Research Endowment for their generous support, which made my participation in FURSCA possible. This experience has greatly contributed to my academic and professional growth, and I am truly thankful for this opportunity.

References:

Department for International Trade. (2022, August 16). *Developing Countries Trading Scheme: Government Policy.* Retrieved from (https://www.gov.uk/government/publications)

Dinkneh Gebre Borojo, Jiang Yushi, Miao Miao. (2022, June 8). *The impacts of trade policy uncertainty on trade flow of emerging economies and low-income developing countries.* Taylor Francis Online: (https://www.tandfonline.com/doi/full)

Metadata Glossary. (2023). *World Bank Data*: (https://databank.worldbank.org/metadataglossary)

The World Bank. (2018, April 3). *Stronger Open Trade Policies Enable Economic Growth for All.* Worldbank.org: (https://www.worldbank.org/en/results/2018/04/03)

United Nations. (2018). *Trade Policy Frameworks for Developing Countries: A Manual of Best Practices.* UNCTAD.org (https://unctad.org/webflyer)

World Bank. (2018). *Logistics Performance Index (LPI).* World Bank Data (https://databank.worldbank.org/source)

Department for International Trade. (2022, August 16). *Developing Countries Trading Scheme: Government Policy Response.*

Metadata Glossary. (2022). *World Bank Data* (https://databank.worldbank.org/metadataglossary/logistics-performance-index-(lpi))

The World Bank. (2018, April 3). *Stronger Open Trade Policies Enable Economic Growth for All.* Retrieved from (https://www.worldbank.org/en/results/2018/04/03/stronger-open-trade-policies-enables-economic-growth-for-all)

United Nations. (2023). *Trade Policy Frameworks for Developing Countries.* Retrieved from (https://unctad.org/webflyer/trade-policy-frameworks-developing-countries-manual-best-practices)

Borojo, D. G. (2023, May 17). *Economic Research.* Retrieved from (https://www.tandfonline.com/doi/full/10.1080/1331677X.2022.2081235)