

# BMF CP57: A Gravity Model analysis of Ukraine crisis impact on Germany's trade patterns

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“It has been a very difficult fishing season. If we want to be full, we have to create a joint venture.”

– In “Joint Venture”; *The Kingfisher Story Collection* [1]

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## 1. Introduction

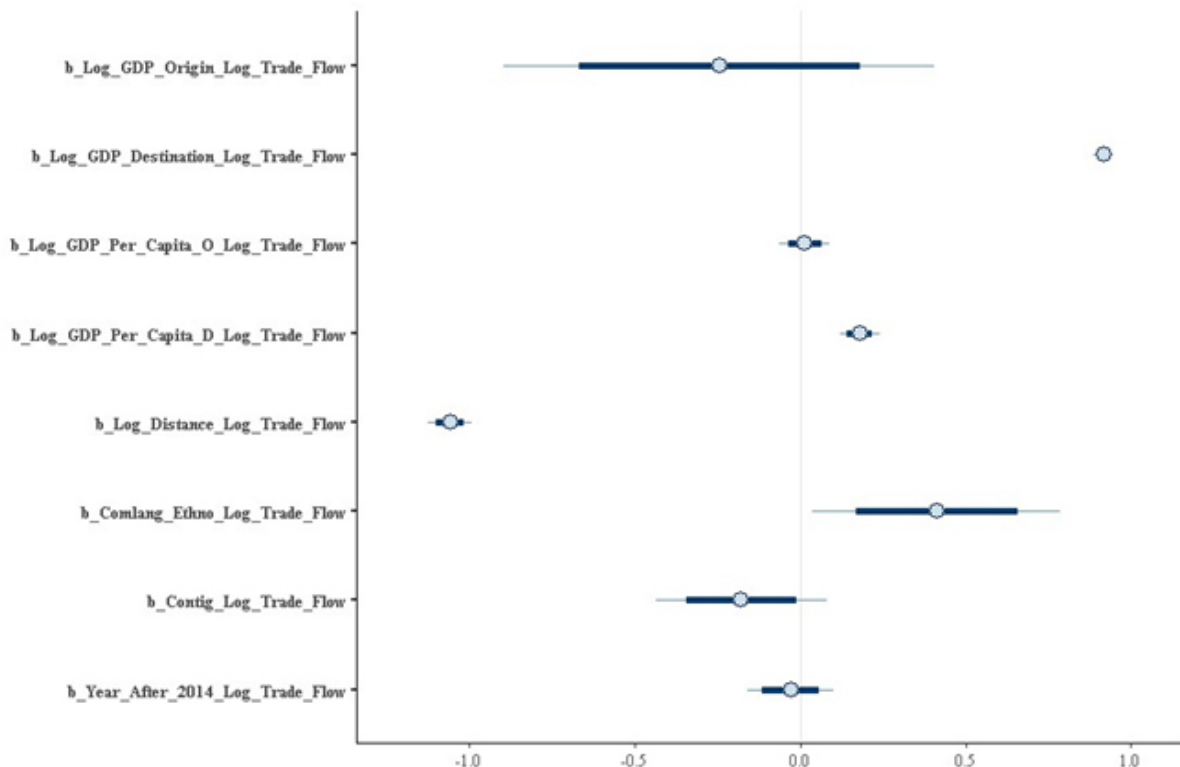
The Ukraine conflict has profoundly affected global trade and international relations, particularly for Germany, a major player in Europe and the European Union. This study utilizes a Gravity Model analysis to explore Germany's trade network and assess the impact of the conflict on its trade partnerships. By examining missed opportunities and potential disruptions caused by conflicts, the research contributes to a deeper understanding of trade dynamics post-geopolitical crises. This knowledge can guide policymakers and stakeholders in adapting trade policies and sustaining partnerships amid conflicts. Germany's economic well-being relies heavily on exports, making it crucial to analyze the Ukraine crisis's effects on its trade dynamics.

## 2. Materials and Methods

This study gathers data on Germany’s trade and the Ukraine conflict, utilizing sources like the World Integrated Trade System (WITS) managed by the IMF, UNCTAD, and the WTO. The IMF’s trade statistics department provides trade data, while the World Bank’s World Trade Indicators database offers GDP, per capita GDP, and population figures. Geographical distance data is sourced from Jon Haveman’s database. Bayesian analysis was used to examine two forms of the enhanced gravity model [2,3], while Mindsponge Theory was employed to complement the reasoning of the gravity model [4]. To accommodate the exploratory nature of this study, models were constructed with uninformative priors or flat prior distributions, offering minimal prior information for model estimations.

### 3. Findings

Two models are fitted to explain trade flows between Germany and trading partners: a GDP and population models. Predictors are GDP, GDP per capita, distance, common language, contingency, year after 2014, GDP difference, population. In the GDP model, the GDP of the origin country, distance, and contingency negatively affect trade flow between Germany and its trading partners (see Figure 1). In the population model, the GDP per capita of the origin country and distance negatively affect trade flow. This model replaces GDP with population to solve the endogeneity problem.



## **Figure 1.** Predictors of trade flow

### **Collaboration details**

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All the resources for conducting and writing the research manuscript will be distributed upon project participation.

Project coordinator: **Nguyen Manh Cuong**

AISDL mentor for this project: Minh-Hoang Nguyen

Other members who have joined the project: Noah C. Mutai and Lawrence Ibeh.

The research project strictly adheres to scientific integrity standards, including authorship rights and obligations, without incurring an economic burden at participants' expenses.

### **References**

[1] Vuong QH. (2022). *The Kingfisher Story Collection*. <https://www.amazon.com/dp/B0BG2NNHY6>

[2] Vuong QH, Nguyen MH, La VP. (2022). *The mindsponge and BMF analytics for innovative thinking in social sciences and humanities*. De Gruyter. <https://www.amazon.com/dp/8367405102/>

[3] La VP, Vuong QH. (2019). bayesvl: Visually Learning the Graphical Structure of Bayesian Networks and Performing MCMC with 'Stan'. <https://cran.r-project.org/web/packages/bayesvl/index.html>

[4] Vuong QH. (2023). *Mindsponge Theory*. De Gruyter. <https://www.amazon.com/dp/8367405145/>



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