# Incidence of the Economic Complementation Agreement (ACE 35) on Paraguay's Exports to Chile (1997–2021)

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**Abstract**

Chile is an important trading partner for Mercosur countries in general, and Paraguay is no exception. This research aims to determine the impact of the Economic Complementation Agreement (ACE 35) on Paraguay's exports to Chile during the period 1997–2021. A descriptive and correlational bibliographic-documentary methodology was employed, considering the use of a gravity model of foreign trade. The results indicated that ACE 35 has had a positive and statistically significant impact on Paraguay's exports to Chile.

**Keywords:** Economic Complementation Agreement, trade flows, Paraguay, Chile

# Results

## Economic and Trade Profile of Paraguay and Chile

Paraguay's average GDP between 1997 and 2021 was USD 33.4 billion (2014 constant USD), with an average growth rate of 2.87% and inflation of 3.5%. Its trade openness ratio is around 65%. External shocks such as weather conditions have a significant impact on Paraguay's main exports: electricity, soybeans, and beef. Although landlocked, Paraguay mitigates logistics costs through the Paraná–Paraguay–Plata waterway.

Chile, in turn, is characterised by solid financial institutions and one of the strongest sovereign bond ratings in the region. Its GDP per capita rose from USD 5,796 in 1997 to USD 16,065 in 2021. Chile's exports equal about one-third of GDP, with copper as the main product (20% of fiscal revenues). It is also a leading exporter of iodine, lithium, and fruits such as grapes, blueberries, and plums. Its trade openness ratio is about 60%.

## Trade Balance Paraguay–Chile

Between 1997 and 2021, Paraguay maintained a trade surplus with Chile in most years, except for 1997, 2003, and 2004. Exports to Chile grew from USD 34 million in 1997 to USD 998 million in 2021, an increase of 27.8 times. Imports from Chile rose more moderately, from USD 60 million in 1997 to USD 111 million in 2021.

The share of Chile in Paraguay's total trade averaged 3% over the period. Before the full tariff liberalisation in 2012, Chile represented 2.4% of Paraguay's trade; afterwards, this increased to 3.8%, confirming the positive effect of tariff reduction.

## Export Basket and Product Concentration

In 1997, Paraguay exported 73 products to Chile, with the top five accounting for 88.6% of exports. By 2021, the basket included 367 products, but concentration had increased: the top five made up 96% of exports. Beef remained the leading product, and its share of Paraguayan exports to Chile grew significantly, from 1,000 tons in 1997 to 7,000 tons in 2021.

In contrast, Chile's export basket to Paraguay was more diversified: 1,446 products in 1997 and 1,047 in 2021. The top five accounted for less than 30% in both years, with products such as copper wire, bottled red wine, medicines, and tobacco preparations.

# Econometric Estimation of ACE 35

The gravity model with fixed effects was applied to estimate the impact of the Economic Complementation Agreement (ACE 35) on Paraguayan exports to Chile. The structural specification is given by:

$$Ex_{ij} = \beta_0 + \beta_1 PIB_{pych} + \beta_2 POB_{pych} + \beta_3 Remoteness + \beta_4 ACE + \epsilon_{ij} \tag{1}$$

where:

- $Ex_{ij}$ denotes Paraguayan exports to Chile (and comparator countries),
- $PIB_{pych}$ is the product of the GDPs of Paraguay and Chile,
- $POB_{pych}$ is the product of their populations,
- $Remoteness$ is a proxy for trade costs, and
- $ACE$ is a dummy variable taking value 1 after the implementation of the agreement in 1997.

To obtain elasticities, the model was estimated in logarithmic form:

$$\ln Ex_{ij} = \beta_0 + \beta_1 \ln(PIB_{pych}) + \beta_2 \ln(POB_{pych}) + \beta_3 \ln(Remoteness) + \beta_4 ACE + \epsilon_{ij} \tag{2}$$

The fixed-effects estimation produced the following coefficients:

Table 1: Econometric Results of the Gravity Model (Fixed Effects, 1997–2021)

| Variable | Coefficient | Std. Error | Significance |
|---|---|---|---|
| Constant | -90.5292 | 25.2906 | *** |
| $\ln(PIB_{pych})$ | 1.1213 | 0.2550 | *** |
| $\ln(POB_{pych})$ | 1.6902 | 0.4326 | *** |
| $ACE$ (dummy) | 3.5263 | 0.3524 | *** |
| $\ln(Remoteness)$ | -2.2425 | 0.4512 | *** |
| $R^2$ (within) | 0.742 | | |
| Observations | 100 | | |

*** $p < 0.01$

The results indicate that GDP and population exert a positive and significant effect on Paraguayan exports to Chile, while relative distance has a negative effect, as predicted by theory. The ACE 35 dummy variable shows a positive coefficient of 3.52, indicating that

the agreement increased Paraguay's exports to Chile by an average of 3.5% during 1997–2021.

Diagnostic tests, including the Durbin–Watson statistic and Breusch–Pagan test, confirmed that the model is statistically robust and free from major specification errors.

The within $R^2$ of 0.74 suggests that nearly three-quarters of the variation in exports is explained by the explanatory variables, providing a strong empirical fit.

Substantively, these findings imply that economic size and market scale were key drivers of bilateral trade flows, while geographical distance remained a structural barrier. Most importantly, the positive and significant effect of ACE 35 confirms the hypothesis that the agreement facilitated trade integration between Paraguay and Chile, lowering transaction costs and enhancing export linkages.

# Conclusions

The results of this research highlight important aspects of regional integration in Latin America. The Economic Complementation Agreement No. 35, signed between Paraguay and Chile in 1996 under the framework of ALADI and MERCOSUR, provided the institutional basis for greater trade flows. The evidence shows that integration mechanisms allow countries, despite their differences, to expand opportunities for trade.

By applying a panel data gravity model with fixed effects for the period 1997–2021, the study confirmed that the ACE 35 had a statistically significant and positive effect on Paraguay's exports to Chile. The estimated coefficient of 3.5% demonstrates that the agreement not only liberalised tariffs but also contributed to deepening bilateral trade relations.

These findings are consistent with economic theory, as exports were found to be directly linked to the size of the economies (GDP and population), inversely related to relative distance, and poaffected by the agreement.

In practical terms, this means that Paraguay's exports to Chile benefited considerably from the agreement, particularly after the full implementation of tariff liberalisation in 2012.

Nevertheless, the concentration of Paraguayan exports, especially in beef, reveals both opportunities and vulnerabilities that should be addressed in future trade strategies.

Further studies, combining qualitative and quantitative methods, are recommended to explore how integration agreements can be optimised to diversify exports, strengthen regional value chains, and take advantage of new areas such as services and technology.