

Economic Brief

Impact assessment of implementing the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Amidst the current EU policy discussions on the adoption of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), the European Commission has requested that an Impact Assessment study be carried out. In the context of this study, London Economics has carried out an econometric assessment of the likely trade impacts of GHS implementation.

London Economics' methodology comprised three main components: estimation of an empirical relationship between trade flows and trade barriers; estimation of the change in the level of relevant barriers resulting from GHS implementation; and estimation of the total trade impact of GHS, using the results from the two previous strands of work under four different scenarios for the evolution of the GHS implementation in the EU as compared to that of its trading partners. This note briefly reports on the implementation of respective techniques and associated results.

The harmonisation of classification and labelling of chemical substances and mixtures across trading partners is expected to have a positive impact on trade flows. In the terminology of international trade, GHS adoption by trading partners corresponds to a lowering of non-tariff barriers (NTBs) between them.

The impact assessment performed by LE focused on the estimation of the impact of GHS on trade flows into and out of the EU area. We report on the methodology and results below.

A model of trade relations

The initial methodological step of LE's work was the formulation and empirical estimation of a model, which relates the relevant trade flows with explanatory variables that include, among others, different measures of trade barriers.

Among the methods for the econometric analysis of the impact of barriers on trade, *gravity equation*-based methods feature prominently. Trade flows between regions/countries are postulated as a function of their "economic mass" and "economic distance". Economic mass is related to the size of the economy while

economic distance comprises physical distance as well as other potentially trade limiting factors such as tariff and non-tariff trade barriers.

Given that the focus of our study was on the impact of NTBs on trade flows, in our final model specification we aggregated all other variables into two types of "fixed effects" variables (country-specific and country-pair specific). These capture factors impacting on trade levels that are constant across product categories for a given country and for a given country-pair. To identify the impact of trade barriers we included one variable for tariff barriers and one variable for non-tariff barriers.

Econometric Methodology

The final model has been estimated using a Tobit estimation procedure with instrumental variables (IV). The use of the Tobit is justified by the presence of zeros in the dependent variable (for some products and for some country pairs, trade flow is zero). The use of instrumental variables was required due to endogeneity of some explanatory variables. Endogeneity may exist if there is a greater likelihood that the number of trade barriers is high when trade flows

are large. Without IV estimation, this would result in a positive bias for the estimated trade barrier coefficient.

The final model yields a robust econometric relationship between chemicals trade flows and a set of explanatory variables that include measures of tariff and non-tariff barriers for the EU and its main trading partners.

The statistical properties of our final model, estimated on 40,859 observations, are highly satisfactory. We obtained very high values for the statistical tests on the overall statistical significance of the model and on the endogeneity of the instrumental variables. In addition, practically all coefficients of the explanatory variables are statistically significant at the 99% level.

Our model has further withstood a number of robustness checks, including a) alternative specifications for the explanatory variables and the instrumental variables, b) leaving potential outliers out of the sample, and c) using alternative estimation techniques.

Results

In our final model, the elasticity of trade flows with respect to the level of non-tariff barriers was estimated at -0.025 with a 90% confidence interval ranging from -0.012 to -0.038. This value is then used as an input in our calculation of the impact of GHS on EU chemicals' trade flows.

GHS and the level of NTBs

Since GHS adoption reduces non-tariff barriers but does not eliminate them, we needed to estimate the weight of GHS in the overall levels of NTBs.

As part of a parallel consultation process, individual companies and trade associations within the EU were asked to give quantitative information on their current trade-related costs and the costs' share that is related to differences in classification and labelling requirements. The responses were used to quantify the impact of GHS on the level of NTBs.

Baseline and scenarios

The baseline is the non-adoption of the GHS in the EU. To model this scenario we assumed that this implied the trading partners of the EU implement GHS with a transition period of 3 years for substances and 5 further years for mixtures. In addition, EU classification and labelling (C&L) and "safety-data-sheets" (SDS) are no longer accepted by non-EU countries, with GHS-based information required. The four alternative scenarios presented are: (1) "GHS global with EU lagging behind" (2) "GHS global and simultaneous" (3) "GHS global with EU delay for partial REACH¹ implementation" (4) "Fragmented Global C&L" or "worst case scenario"

Table 1: Analysis of scenarios

	Predicted reduction in:	
	Exports	Imports
Baseline	504,204	419,852
Scenario 1	224,283	186,761
Scenario 2	0	0
Scenario 3	113,322	73,518
Scenario 4	1,163,884	969,168

*Note: €000s, in present value.
Source: LE calculations.*

Conclusions

Non-implementation of GHS in the EU is estimated to result in a loss of roughly €504 million for exports and €420 million for imports in total over the period in question.

For further information, please contact:
Dr. Paula Ramada (+44 20 7866 8177) or Mr.
Patrice Muller (+44 20 7866 8181)

London Economics, European Head Office
11-15 Betterton Street
London WC2H 9BP
United Kingdom

¹ REACH - EU Regulatory Framework for the Registration, Evaluation and Authorisation of Chemicals

