



MS-E2177 - Seminar on Case Studies
in Operations Research

**Effects of Import Tariffs to
International Plywood Trade in the
UK**

Interim Report

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1 Changes in the objectives and scope

At the first seminar session by the project group, as noted by the opponent group and the course staff, the objectives of this project and the methods to achieve them were unclear. The initial objectives of the project were to determine how import tariffs and quotas have affected the import of plywood to the EU and consequently the trade in the EU, and to build a model to estimate these effects on potential future changes in tariffs and quotas.

As a result of several scoping meetings with our client, there is now a clearer scope of the project, and a better understanding of the required methods. The team has decided with the client to focus on the import trade of softwood and hardwood plywood into the UK, instead of the EU as a whole. This choice was done because the UK has little domestic production of plywood and therefore the import quantities can better be utilized to model the total demand of plywood. Secondly, the UK has an interesting current political landscape because of Brexit, and some kind of future changes to tariffs and therefore, possibly to the import trade are expected.

Based on preliminary visualizations made using the available import and tariff data, the tariff and quota seem to have a clear effect on the import volumes. However, it proved to be very difficult and inaccurate to study the direct effect of tariffs to the demand of plywood with the available data. Thus, in addition to the updated scope, a different methodological approach was agreed upon. The plan is to use regression analysis to study the effects of price to the import demand of plywood, and to determine cross-price elasticities between the different plywood importers. With this elasticity information we can estimate the effects of possible tariff reductions (resulting in price decreases) made by the UK on the trade volumes from each of its partner countries.

2 Project status and changes to initial project plan

The project has progressed mainly as planned in the initial schedule. The collection and preprocessing of the data was done mainly on schedule, while some preprocessing has had to be done after selecting the approach. The meetings with the client have been organized with the planned intervals, now with remote connections. However, the implementation of the model has been postponed for a few weeks since it has taken a longer time for the project team and to get a proper vision of the approach and methods needed to build the model. Additionally, the surrounding circumstances due to the coronavirus

Tasks	Activities	Week Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Client interaction	Meeting at Metsä wood office																						
Reporting	Project plan delivery																						
	Interim report delivery																						
	Final report delivery																						
Data	Collection																						
	Pre-processing																						
Modelling	Exploring sufficient methods																						
	Building regression models																						
	Tuning the final model																						
Analysis	Analyzing cross-price elasticities																						

Figure 1: The updated schedule of the project. The weeks correspond to official calendar weeks in 2020. The changes in the original schedule are highlighted.

and the changes it spawned into people’s lives caused slight overall disorientation which is also temporarily reflected in the project progression. However, as alternative ways to collaboratively work with the project and communicate both internally and with the client were found quickly, the progress of the project has been relatively good after getting familiar with the new ways of working. The updated project schedule is presented in Figure 1.

The mathematical approaches to build the model are selected, and as described earlier, regression analysis is utilized in determining cross-price elasticities between different plywood importers. Some preliminary experiments with different regression models have been done, and some preliminary outcomes have been acquired, which have however suggested that some effort is still needed to find the correct structure for the model and how the data should be utilized in it. Additionally, the quality of the collected data has turned out not to be exactly desirable, but the team is still optimistic that the data will be suitable for the model. Some literature review and experimentation will still be needed to develop the final model which will be selected and validated also with obtained feedback from the client as the subject matter expert. As regression modelling is not exactly the core competence of any of the team members, additional knowledge on the topic is still continuously built through literature searches in order to be able to construct a correct and useful regression model.

Regarding the regression model, the team has multiple different approaches that could be considered. The main idea is that the import volume or the market share of a single importer is explained by the plywood prices of other importing countries. This way we are able to determine cross-price elasticities for different imported plywood types.

However, we need to test and study the prices of each importer. For instance, if we need to scale the prices according to the price of the explained country, use weighted regression to consider the market shares of each importer, compare results of linear or logistic regression or add other substituting products also in the model, such as OSB-wood when analysing especially the price elasticity of the softwood plywood.

3 Updated risk management plan

The risks of the project were re-evaluated to better suit the current status of the project. The updated risk management plan is presented in Table 1. At this point, the project team has more experience and confidence in both the subject matter and the potential analytical approaches, as well as a clearer scope for the project. Therefore, we have lowered the likelihoods of analysis failure and scoping issues from our initial risk assessment. In addition, we have included the global COVID-19 pandemic in our plan, as it can potentially have an impact on the project by forcing the team to restructure some of its working and communication processes.

From Table 1 it can be seen that the likelihoods of most of the risks are estimated to be either low or medium. This is desirable, since it is also estimated that the realization of these risks would have high or medium impacts to the success of the project. So far we have been able to take the necessary means and precautions to avoid these most impactful risks. The team has also adjusted very well to the new remote ways of working, which means that the ongoing pandemic will most likely have little effect on the completion of the project. All in all, the prospects for completing the project successfully look promising.

Table 1: Updated risk estimates and action plan. Changes to the initial risk management plan are highlighted with green (decreased likelihoods) and red (new risks).

Risk	Likelihood	Impact	Effect	How to avoid
Analysis fails, no useful results	Low/Medium	High	No use for the model or analysis results	Proper planning and approach evaluation
Data quality or compatibility issues	Medium	High	Misleading or inadequate results	Limiting the amount of different data sources
Scope of the project is too broad	Low	Medium	Low quality results and possible delays	Clear vision of the project at an early state
Team member absence	Low	High	Too much work for others	Clear roles for all members of the group
Communication difficulties with client	Low	Medium	Results do not align with expectations	Regular meetings and email communication
Global pandemic	Ongoing	Low	Inability to arrange physical meetings	Use of good remote working practices and digital communication channels