

CASE STUDY: MESO-LEVEL GVC ANALYSIS OF KOREAN SHIPBUILDING

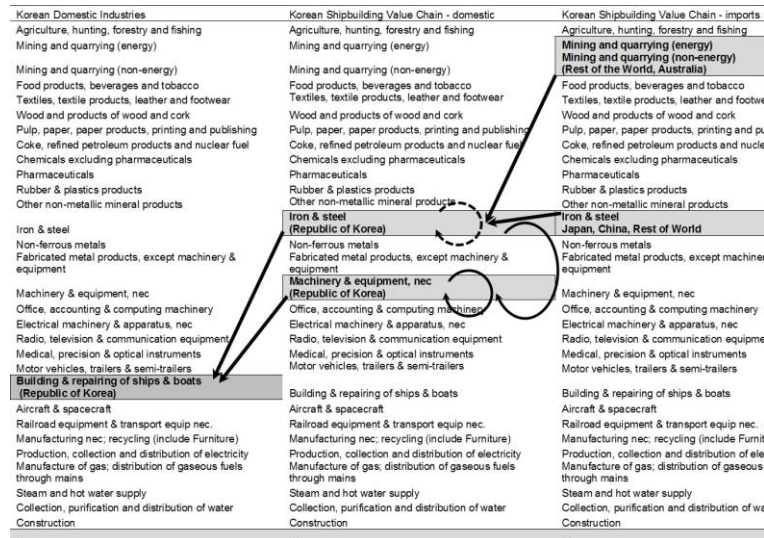
Introduction and challenge

Korean trade policy makers are concerned with increased talk about trade wars and the impact of trade tariffs on one of the country's major industries, shipbuilding. To understand which countries to target for specific trade policies, the first challenge is to understand who their significant trade partners are for this industry (in this case the suppliers of input to shipbuilding, not the buyers of finished vessels).

Solution and implementation steps

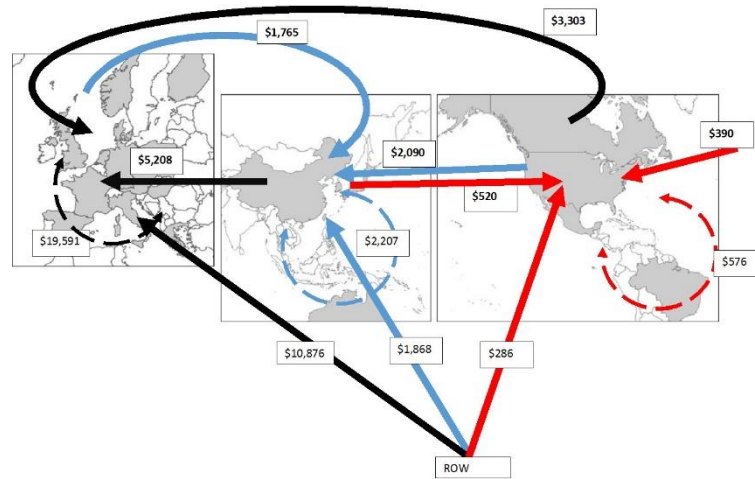
When reviewing the trade data for inputs to all domestic industries (left column of Figure 1), they identify the top domestic source industries (middle column of Figure 1). This reveals that the industry is quite reliant domestic Iron & Steel and Machinery & Equipment industries, which are relatively self-supporting within the country. In other words, Korean shipbuilding appears to be relatively economically sovereign. However, exploring the international source industries (right column of Figure 1) indicates that these source industries are reliant on importing materials from Mining (energy and non-energy related) and on Iron and Steel, thus revealing a more complex picture of critical trade partners. This brings to light the question of finding an appropriate balance of economic sovereignty versus playing a key role in a globally connected industry.

Figure 1: Korean shipbuilding across two steps in its GVC



In comparison, investigating the GVC structure at the macro-level reveals relatively little actionable information. As shown in the economic-bloc analysis in Figure 2, the global shipbuilding industry is massive and that all major economic blocs are interconnected. What the figure does imply, is that fumbling a trade partnership could mean being left out as the rest of the industry circumvents the Korean contribution to the industry.

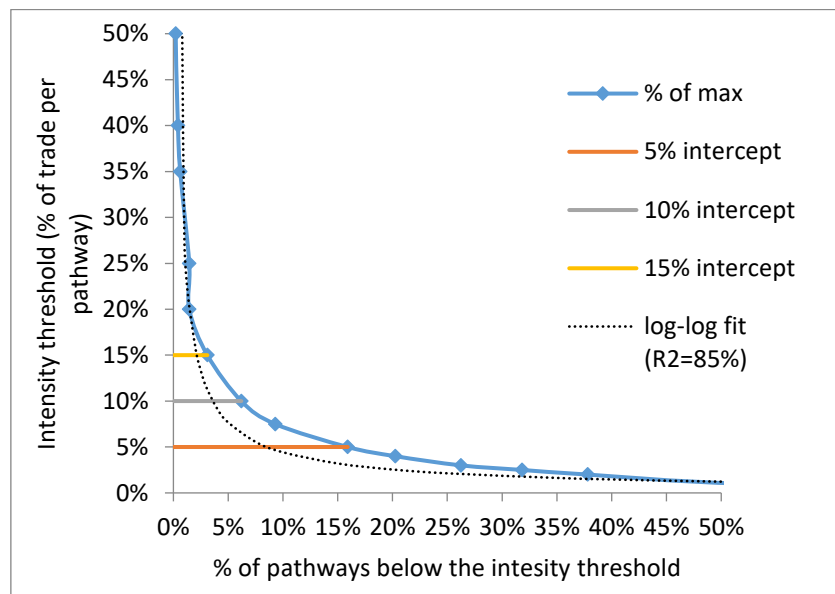
Figure 2. Shipbuilding as a global industry across three economic blocs (\$USDmillion as at 2000)



To illustrate this point, Figure 4 shows the proportion (x-axis) of trade pathways below a given level of % of sourcing (y-axis) across all countries in the model, with the example of shipbuilding. The distribution has an 84.6 R2 with a log-log model. Setting a threshold of 10% (y-axis) above which a trade pathway is ‘significant’ would retain a focus on approximately 7% of all country-country sourcing pathways in the model.

To get to a more actionable level of analysis, the policy makers follow the method described in this chapter to analyse all country-to-country sourcing pathways, including all inputs to the shipbuilding industry. This reveals the distribution of trade intensity across countries shown in Figure 3, from which only the pathways with 10% or more sources being imported will be considered.

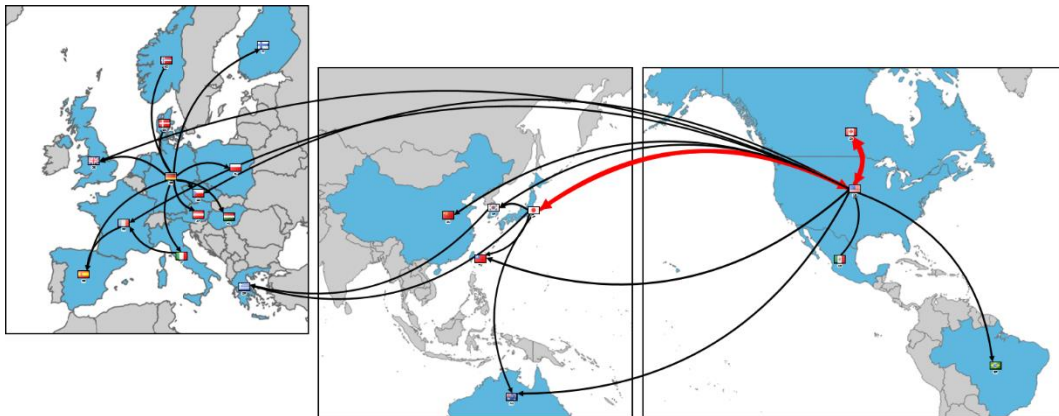
Figure 3: Scale free distribution of the trade intensity across all inter-country pathways in the global shipbuilding industry complex.



When overlaying the pathways with over 10% trade intensity onto a map, the policy makers observe a Korea’s more specific ‘place’ in the industry, globally, shown in Figure 4. This visualisation reinforces that major sources to Korean shipbuilding come from Japan and the US. Korean shipbuilding also appears to be a

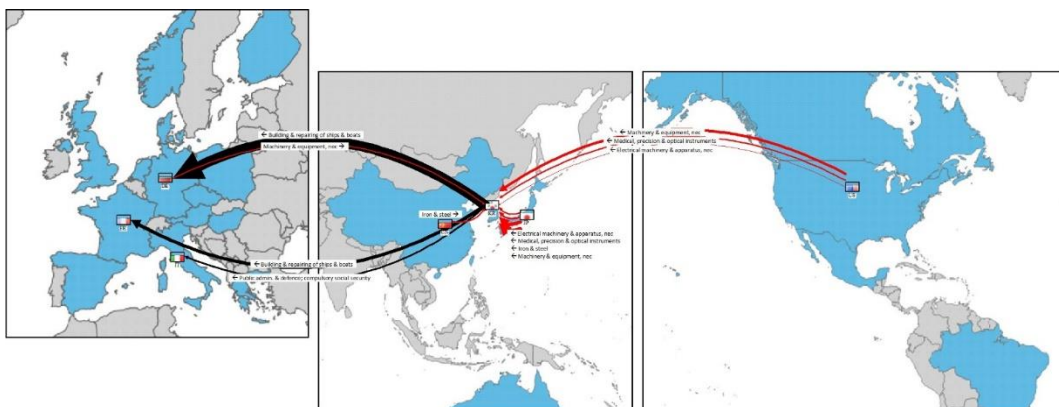
significant supplier only to Greece, relative to the size of its economy. This confirms the combined message of Figures 1 and 2, that Korean shipbuilding is a ‘small fish in a big ocean’ that is more reliant on others than others are of it (as a buyer of imports). Thus, if trade wars did start, the Korean shipbuilding industry may not carry much weight on an international stage and would have to be considered by the Korean policy makers in comparison to other industries where it may be in a stronger or more vulnerable position.

Figure 4. Trade complex for the shipbuilding industry, globally



To get a more actionable network analysis of the data in Figure 1, the policy makers apply the same logic of focussing on only the sourcing pathways with over 10% of trade occurring internationally. Except, this time only the relationships to *and* from Korean shipbuilding are considered, from which to select those over 10%. This reveals the following structure, shown in Figure 5, where the arrow thickness represents the relative intensity of trade.

Figure 5. Significant imports + importers of Korean Shipbuilding



This figure confirmed that Iron & Steel imports from China and Japan are significant, prompting the policy makers to consider alternative sources from nearby countries, should these trade relationships buckle. Likewise, significant imports of Machinery & equipment are observed from Japan and the US. Other significant imports are also observed from these two source countries, painting a more complex picture of trade. For example, how might Japanese or US suppliers of navigation systems (included in the ‘Medical, precision & optical instruments’ industry) react if they see Korea negotiating fiercely with their colleagues in

the Machinery and equipment industry? Who else could Korean shipbuilders turn to? It seems the only other significant supplier of Medical, precision & optical instruments is Germany. At least with the Korean-German relationship, it appears that Korea supplies more value to Germany than it receives, suggesting there may be room to negotiate a stronger bilateral cross-industry relationship.

As Korean policy makers, what would you recommend to Korean shipbuilders? How do you think you could negotiate trade on their behalf at the global scale? Or, would you recommend each exporter and importer fend for themselves?