

Appendix 1. Decomposition of gross exports and identification of components composing upstream and downstream spillovers

The following figure presents how gross export can be completely decomposed into 16 non-overlapping components.

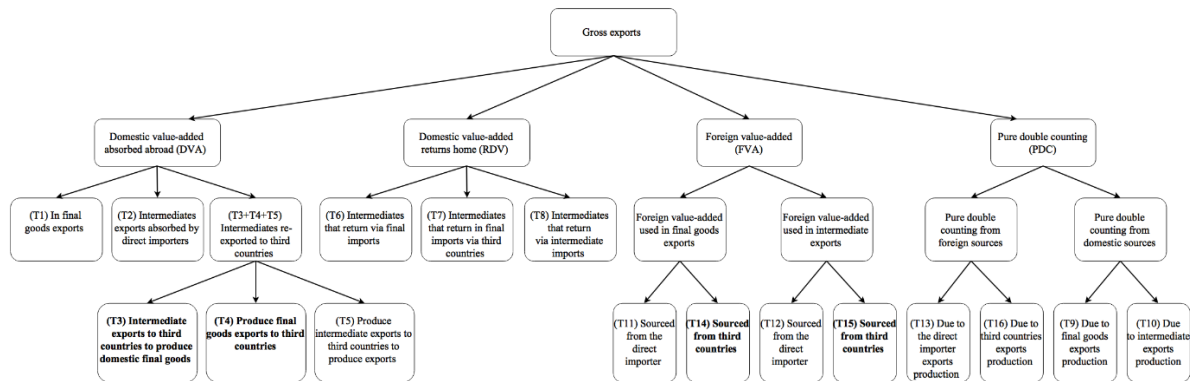


Fig. A1.1. Decomposition of gross exports. Gross exports are entirely decomposed into 16 non-overlapping components (T1 to T16). Quoted from Wang et al. (2013).

Among these 16 components, the value added sourced from third parties is divided into that used as final products (T14 as labelled in the original paper) and intermediate products (T15). Together these represent third party production induced by exports, and thus the sum of T14 and T15 gives a measure of upstream spillovers. Likewise, the value added transported to third parties as intermediate products (T3) and final products (T4) represent the consumption induced by exports. The sum of T3 and T4 thus gives a measure of downstream spillovers.

The four components (T3, T4, T14 and T15) as well as upstream and downstream spillovers can be illustrated using the example of auto parts and automobile trade in the main text. Suppose that China further imports intermediate products from Russia and the USA further exports final products to Canada. In this case the four components can be depicted as shown in Fig. 2 in the main text, where Poland’s export to Germany is taken as the focal export to be decomposed. In this example of telecoupled trade, Poland is the sending system and Germany is the receiving system, and the remaining four countries are third parties. On the production side, China’s contribution of providing final products to the production of the traded products is T14, and Russia’s contribution of providing intermediate products is T15. The sum of T14 and T15 is the upstream spillover of the Poland-Germany trade. In the consumption, USA’s consumption of the traded products as final products is T4, and Canada’s consumption as intermediate products are T3. The sum of T4 and T3 is the downstream spillovers of the trade.