Compiling time-series of the Dutch input-output table with multinationals and non-multinationals

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This paper discusses ongoing work by Statistics Netherlands on slicing up Dutch IOTs by firm type with a focus on the activities of multinationals (MNEs). Industries in the extended IOTs are broken down into five categories: 1) small non-MNEs, 2) large non-MNEs, 3) small Dutch MNEs, 4) large Dutch MNEs, and 5) foreign MNEs. The analysis provides new insights into the importance of MNEs for the Dutch economy and addresses questions such as: what was the contribution of Dutch MNEs to exports? How many jobs were created by foreign MNEs and how many by small firms? How much capital and labor income was created in small firms due to the exports of foreign MNEs? And to what extent are large firms in the manufacturing sector dependent on small firms in the services sector for their final output?

The method builds upon earlier work on breaking down Dutch IO-tables by multinational status and size class (e.g., see Walhout et al. (2017) and Onat et al. (2018)) and applies it to a more granular level in terms of industries and by constructing a new annual time-series from 2015-2021. The approach uses a short-cut technique implemented by Piacentini and Fortanier (2015) that is based on using shares of different types of firms in trade and production to slice up industries. This is much less demanding in terms of resources as compared to the traditional way of breaking down the supply-use tables themselves. We show that this approach can be used to break down the IOT at a very detailed level while still ensuring a stable time-series. The construction of a stable time-series is crucial yet also an aspect less commonly discussed in the literature on extended IOTs. We ensure that years and results are well-comparable by performing checks and making small adjustments. The paper will describe our experiences, including solutions to several of the problems encountered on the way.

We incorporate a number of different data sources to add this heterogeneity by firm characteristics. Data on firm-level output, value added, and employees (size class) is drawn from Structural Business Statistics, and we make estimations for firms not included in the survey. The data is matched to information on domestic/foreign ownership from the Inward Foreign Affiliates Statistics based on the ultimate controlling institutional unit. It is then matched to information about foreign affiliates yes/no, and together with the ownership information this yields whether a Dutch-owned firm is a multinational or not. Trade data is based on extending the approach of Aerts et al. (2022) by linking firm-level exports and imports at the detailed product level to their multinational status and subsequently matching this to industries in the IOT a way that is fully consistent with the concept of economic ownership in the National Accounts. In addition, we use firm-level survey data and register data on services trade to provide estimates on this part as well.

One of the particular strengths of the approach is the additional detail present in the underlying data architecture that will pave the way for novel extensions in future work. For example, the firm-level data on multinationals, including matched trade data, can be allocated to the home country of the firm such that the category "foreign MNE" can be further subdivided in the IOT (e.g., into "German MNE" or "French MNE"). Also, the detailed trade data linked to National Account totals is only aggregated away in one of the last steps for the purposes of the current study – i.e., over all firms, products, and destinations for goods and services. We will discuss how we intend to keep this split by product and destination in future work to integrate even more detail into the extended IOT.

The findings show that multinational firms are responsible for about three-quarters of Dutch imports and exports and almost one-third of total value added production, shares that remained remarkably stable over time. Approximately two-thirds of the trade by MNEs is carried out by foreign MNEs and the remainder by (mostly large) Dutch MNEs. The contribution of only foreign MNEs to total output (about a quarter), jobs (12%) and value added (18%) is also substantial. The importance of Dutch multinationals for value-added production has steadily declined since 2015 - both relative to foreign MNEs and as a share of Dutch GDP. We find that when one considers indirect effects, the role of non-MNEs in trade is considerably larger. Well more than half of their earnings from exports is attributable to exports through other firms. This confirms the notion that also these firms participate in trade but do so indirectly via the chain as suppliers of large firms and MNEs rather than via direct exports.