Application for a Robert Summers Economic Measurement Fellowship to attend the CRIW meeting at the 2023 NBER Summer Institute in Cambridge, MA.

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Expertise and current research interests in economic measurement

Over 15 years of experience in measuring globalization, especially global value chains, at Statistics Netherlands and the OECD (1 year). Active participant in various OECD and Eurostat expert groups; chairing one of them. Current work focusses on methodology to combine microdata and microdata, leading to better and more detailed measurement of globalization. The advantage of microdata is that it has much detail, in countries, products and types of enterprises such as SMEs and multinationals. The advantage of macrodata is that all data is internally consistent, integrated using the same concepts, and that it adds up to important macroeconomic totals such as GDP and total employment. Current research interests are mainly in the following three categories.

1. Extended supply and use tables (SUTs)

Policy makers ask to quantify the contribution of types of firms, such as SMEs and multinationals, to the economy. E.g., employment, value added, imports and exports, by industry by type of firm, such as value added of SMEs in construction. One way to obtain such information is via extended supply and use tables (SUTs): industries in the SUTs are split by type of firm. Also, policy makers want quantification of the interplay between types of firms. E.g., the value added of SMEs due to their supplies in the value chain of exporting multinationals. Such questions can be answered with an extended input-output table, where each industry is split by type of firm. They cannot be answered using current IO-tables. That would assume that SMEs and multinationals in the same industry have the same input and output pattern – and microdata shows that this is not true. Hence, new methodology is needed. This is developed in the OECD Expert Group on Extended Supply and Use Tables that I chair. We are writing a handbook, a methodological guide to compiling Extended SUTs, which describes best practices and proposes guidance in the creation of international standards. Relevant papers are **PRA2** (see references below, article won the Lawrence R. Klein award) and **OA2**.

2. Country dependencies – better estimates, more detail

To know the true dependency of a trade partner it is necessary to know how much of the imports from this country are used for re-exports and how much for the domestic economy. Using methodology developed in **PRA3** showed, e.g., that two thirds of Dutch imports of goods from China are re-exported. Also, microdata shows at product level that imports from country A are used differently in the economy than imports from country B. E.g., Dutch imports of coal from Australia or Russia are used differently. **OA3** describes how to take this heterogeneity into account in global value chain analysis, leading to better estimates of country dependencies. **OA3** also describes how to obtain more detail for countries and products than with multi region input-output (MRIO) tables such as TiVA of OECD. **OA1** explains how to use microdata to obtain more timely and more detailed information about employment and value added embodied in exports to a given country than with MRIOs.

3. Functional specialization

To obtain insights in the strengths and weaknesses of a country one can consider the export basket, or value added in exports by industry. Yet this does not show what is actually happening in an industry. E.g., car manufacturers in Germany and Romania perform different tasks. Timmer et al. (2018) developed the concept of functional specialization, when an industry in a country is relatively specialized in a given business function compared to the same industry in other countries. Our article **PRA5** shows that firms specializing in R&D or marketing are more productive than firms in the same industry specializing in fabrication. The current project with the Technical University of Gdansk and the University of Hasselt shows how multinational presence and interaction with non-multinationals influenced functional specialization of EU countries and how that in turn affected economic growth.

Articles in peer-reviewed journals

PRA1. Edens, B., Hoekstra, R., Zult, D., Lemmers, O., Wilting, H., & Wu, R. (2015). A method to create carbon footprint estimates consistent with national accounts. *Economic Systems Research*, *27*(4), 440-457. DOI

PRA2. Chong, S., Hoekstra, R., Lemmers, O., Van Beveren, I., Van Den Berg, M., Van Der Wal, R., & Verbiest, P. (2019). The role of small-and medium-sized enterprises in the Dutch economy: an analysis using an extended supply and use table. Journal of Economic Structures, 8(1), 1-24. DOI

PRA3. Lemmers, O., & Wong, K. F. (2019). Distinguishing between imports for domestic use and for re-exports: a novel method illustrated for the Netherlands. National Institute Economic Review, 249, R59-R67. DOI

PRA4. van den Berg, M., Van Beveren, I., Lemmers, O., Span, T., & Walker, A. N. (2019). Public export credit insurance in the Netherlands: An input–output approach. *The World Economy*, *42*(9), 2774-2789. DOI

PRA5. de Vries, G., Jiang, A., Lemmers, O., & Wei, S. J. (2021). Firm productivity and functional specialisation. The World Economy, 44(5), 1232-1260. DOI

PRA6. Vancauteren, M., Boutorat, A., & Lemmers, O. (2023). Import Competition, Destinations, and Firms' Patent Strategies. Accepted for publication in *Journal of the Knowledge Economy*. DOI

Other papers, selection

OA1. Lemmers, O. (2015). Who needs MRIOs anyway? An alternative assignment of value added of trade. Paper presented at the 17th Annual conference of the European Trade Study Group (ETGS).

OA2. Lemmers, O. (2022). Measuring the Economic Contribution of Firms and Activities in Terms of National Income. Paper presented at the 2022 ESCoE conference on economic measurement.

OA3. Aerts, N., Bohn, T., Lemmers, O., & Wong, K.F. (2022) Linking micro-data to national input-output tables: by whom and from whom are which products imported and to what end? Paper presented at the 2022 International Input-Output Association (IIOA) conference.

Information about data products the applicant has been involved in constructing

Extended supply and use tables/extended input-output tables (research strand 1), detailed and more accurate information on the use of imports (re-exports, exact use in the domestic economy, research strand 2), detailed and more accurate and timely information on value added and employment embodied in exports (research strand 2, see also yearly published table).

Relevant employment and other information

- 2007-2009, Statistics Netherlands, researcher, trade in goods statistics
- 2009-now, Statistics Netherlands, senior researcher, globalization and global value chains
- February 2016 – March 2017, OECD, statistician/economist, globalization and global value chains
- 2022: received the "unofficial and one-off CPB - honorary award for pleasant and productive cooperation" from CPB Netherlands Bureau for Economic Policy Analysis
- Education: PhD at University of Amsterdam, the Netherlands (2002, mathematics), MSc at Radboud University, the Netherlands (1997, mathematics)