

# Trade and tasks over three decades

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*Offshoring and global value chains have reshaped global trade patterns. This column describes how the German economy has been exposed to significant offshoring for at least three decades. The authors find an increasing importance of high-end tasks in the country. Organising and consulting activities under deadlines, changing business conditions, and tougher performance standards are an increasingly common reality in German workplaces. Labour market institutions in German trade partners are largely unrelated to the changing content of German imports.*

Offshoring has been considered an opportunity for industries and firms to bring down costs and gain foreign market share, as well as for consumers to get access to lower-priced products of high quality. To whom do these welfare gains from globalisation 2.0 accrue? Workers in high-income countries are particularly worried that their jobs are at risk when production stages move abroad. In a recent study based on survey answers to questions about job characteristics, Blinder and Krueger (2013) conclude that one-quarter of US jobs are potentially offshorable. While this may seem a high number, potential offshorability is not the same as actual offshoring, as rightly pointed out by Blinder himself in an earlier VoxEU column (Blinder 2009).

## Trade in task: Theory and empirics

Recent empirical research documents that trade and offshoring affect labour demand by shifting work between occupations (e.g. Jensen and Kletzer 2010, Crinò 2010, Ebenstein *et al.* 2014). Within occupations and sectors, theoretical research posits (e.g. Grossman and Rossi-Hansberg 2008) and empirical evidence suggests (e.g. Becker *et al.* 2013) that tasks matter for offshoring. On the one hand, top trained radiologists in low-income countries interpret computer tomography images at a distance, so this high-skilled occupation may well be at risk to be offshored from high-income countries. On the other hand, a less-skilled janitor's occupation is bound to the workplace and cannot easily relocate. How reflective are these examples of general changes in the economy? How has the composition of workplace tasks changed over the past three decades? Is there a link between offshoring and workplace changes? Do labour market institutions matter for the evolution?

## New evidence from German data

In a recent paper (Becker and Muendler 2015), we use worker-level survey data from Germany, covering the period 1979-2006, to take on these important questions. Quite uniquely by international comparison, the survey data allow us to look at workplace changes for the same occupation within the same industry over time. Much of the existing evidence, in contrast, used to be based on a US occupational classification that required the implicit empirical assumption that the task content of occupations is time invariant.

We use five waves of the German Qualifications and Career survey (1979, 1985-86, 1991-92, 1998-99, 2005-06), the so-called BIBB survey for short. The survey offers detailed information about the tasks a worker reports for the job, and we combine the survey evidence by industry with bilateral trade data for Germany and its trade partners. We have carefully connected the survey information to comparable task information over time and can document two particular dimensions of tasks.

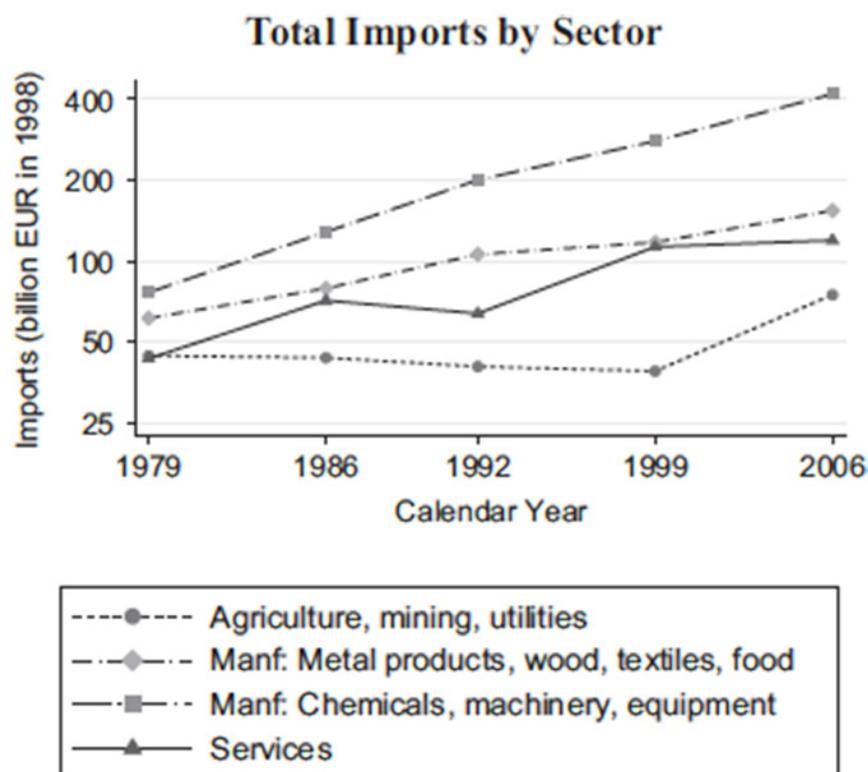
- First, the ‘what?’ dimension of tasks describes 15 activities that a worker may perform or not, such as produce goods; develop, research, construct; organise, plan; or oversee, control.
- Second, the ‘how?’ dimension of tasks captures 9 performance requirements that a worker may need to perform frequently or rarely in a given occupation, such as improve/adopt techniques; face new situations/activities; have work procedures prescribed in detail; or confront deadlines/pressure.

Much of the existing empirical literature has focused on the how dimension of performance requirements, and in particular on the ‘codifiability’ of job prescriptions (work procedures prescribed in detail) and the ‘routineness’ (rarely face new situations/activities). How have tasks at German workplaces evolved over time? Merely counting up the average number of tasks that a worker performs on the job, performance requirements have changed little and imply that these how requirements remain similarly focused in number (but their nature shifts as we will see). In contrast, there is much action in the so far less prominent what dimension of tasks:

We find that the average German worker in 2006 performs six times more activities than in 1979, documenting an increasing trend towards ‘multi-tasking’.

During the same time, Germany’s import and export flows have grown strongly (see Figure 1).

Figure 1. German imports, 1979-2006



## Focusing on the impact of intermediate imports

Given our foremost concern with offshoring, we pay particular attention to trade in intermediate goods—arguably the most distinctive feature of the recent globalisation wave. More than a century ago, during the second half of the 19th century and up to World War I, the world economy underwent a first wave of globalisation ('globalization 1.0') but foreign trade involved mostly the exchange of final goods. Trade then contracted strongly between the wars, and only resumed after World War II. As trade rose to new heights in the latter part of the 20th century, it also took new forms.

A crucial novelty of the recent expansion in globalisation is the rise of trade in intermediate goods. This second wave of globalisation is associated with the formation of value chains across borders, and a large share of world trade is now transacted within the boundaries of multinational firms but between their affiliates across country borders. That is what we call globalisation 2.0 in short.

Beyond OECD standards, the German import matrix is not based on the import proportionality assumption, by which imports of intermediate goods would be inferred from the proportion in which an industry uses domestic intermediate inputs. Instead, the German Statistical Office breaks down imports of intermediates and of final goods, varying by sector. This distinction between outsourcing—an industry's use of intermediate inputs from any source—and offshoring is important.

- Across German industries, the share of outsourcing (intermediate inputs from outside the firm) in the production value has remained fairly constant at about one-half (it dropped from 51 to 47% between 1979 and 1992 but has since risen back to 51% in 2006).

In other words, German industries have been outsourcing about half of their production value for the past three decades.

However, in 1979 only 14% of the intermediate inputs came from abroad (that is about 7% of the production value were imported inputs), but by 2006 close to 22% of inputs are foreign sourced (that is about 11% of the production value are now imported). In other words:

- German industries have replaced about one in eleven domestic supplies with foreign supplies over three decades.

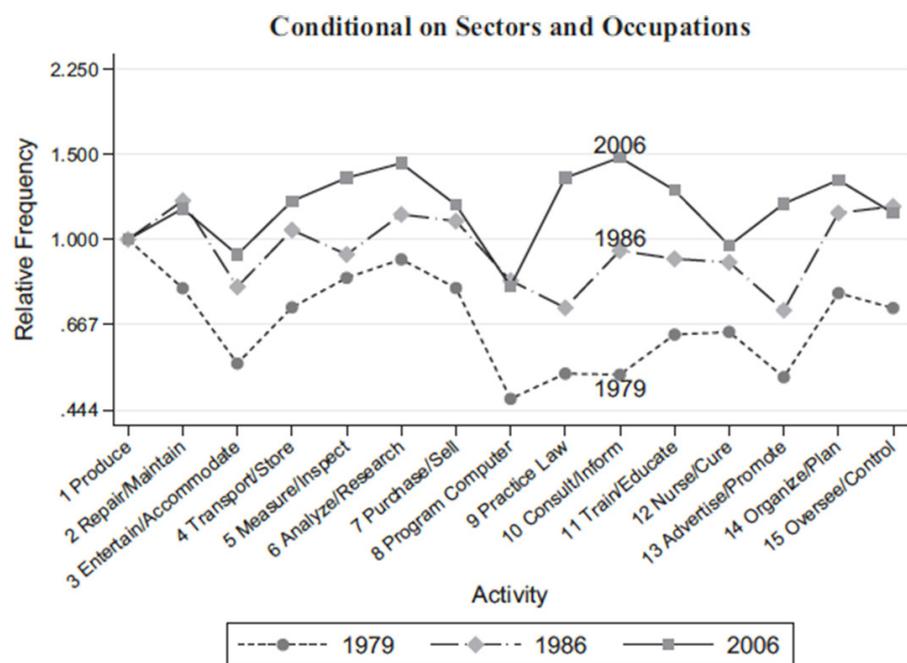
In this sense, offshoring is far from a recent phenomenon, it has just intensified.

Interestingly, nine out of the top-ten import source countries are the same in every single sample year since 1979, and eight of those nine countries are also among Germany's top-ten export destinations in every sample year. The one new top-ten importer country for Germany in 2006 is China, replacing Spain from 1999. A hypothesis consistent with this evidence is that intermediate inputs previously sourced from low-income regions within western Europe are now being sourced from east Asia.

The intensified offshoring of intermediate inputs offers scope for globalisation 2.0 to affect the tasks performed by German workers, over and beyond the effects that globalisation 1.0 continues to exert. In fact, consistent with the idea that offshoring leads to more 'high-end' tasks being performed at home over time, we find that, in the 'what' dimension, activities other than 'produce' (which we consider the most offshorable task) have gained detectably more prominence in German workers' task sets. Importantly, this shift towards more high-end tasks occurs within sectors and occupations, so is a universal phenomenon, as shown in regressions conditioning on sector and occupation effects.

Figure 2 illustrates this point. We show the contribution of 15 activities (relative to the 'produce' category which is normalised to 1.0) to the work performed within given occupations and industries over time. The numbers are from the regression analysis (see paper for details). The visibly striking upward turn of the task profile implies that every single activity gains in importance after the base year 1979, relative to the most offshorable reference category '1 produce'. Most of the shift away from the benchmark activity 'produce' has taken place already by 1986. This early shift in the task profile coincides with descriptive evidence on trade documenting that a strong increase in intermediate imports occurred in the early sample years between 1979 and 1986. Third, the shift away from the benchmark activity 'produce' affects both high-end activities such as '14 organise/plan' or '15 oversee/control' as well as lower-end activities such as '2 repair/maintain'.

**Figure 2.** Activity content of German work



In the 'how' dimension, shifts are somewhat less pronounced, but we do find that performance requirements such as 'meet deadlines' and 'improve techniques' gain relative to the reference category 'prescribed work'.

In regression analysis we assess how tasks have evolved across sectors over time, as predicted by different types of trade flow: intermediate imports, final goods imports, and exports. Across sectors and occupations, exports and imported inputs work mostly in the same direction, raising task frequencies. There is some heterogeneity, however. The change in tasks is slightly stronger in weakly unionised sectors, consistent with the idea that where unions influence the speed of change in the workplace, the transition to high-end tasks proceeds more slowly. Similarly, we find the change in tasks to be slower in tighter labour markets, where arguably the employer side of the labour market is in a weaker position to pursue workplace changes.

## Summary

In conclusion, we find that the German economy has been exposed to significant offshoring for at least three decades. We document an increasing importance of high end tasks in Germany; organising and consulting activities under deadlines, changing business conditions and tougher performance standards are an increasingly common reality in German workplaces. The German labour market has shown to be capable of adjustment, and we detect no systematic market failure that policymakers would need to address in order to make German workers fit for globalisation. If anything, to be prepared for a future increase in offshoring, employers and workers will likely need to emphasise flexible skills and continued training that enable coordination beyond the immediate realm of the individual workplace.

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