# Alternative Margins of Adjustment to Trade Shocks: Self-Employment, Delayed Retirement, and Added Worker Effects*

Aitor Irastorza-Fadrique† Peter Levell‡ Matthias Parey§

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**Abstract**

We study the ways in which households make up for lost labour earnings following trade shocks, including alternative employment forms, delayed retirement and added worker effects, using a large-scale panel dataset of linked censuses for households in England and Wales. We uncover a varied pattern of employment and household adjustments, with gender and age playing major roles in determining how workers respond. Men, especially when young, partly mitigate the adverse impacts of the shock by entering self-employment, while this is not true for women. Older men, but not women, tend to respond to shocks by delaying retirement. Exposure to import competition also reduces the likelihood that affected young women get divorced or find a new partner. The marital status of men in exposed industries is, by contrast, unaffected. As for intra-household insurance, men respond to trade shocks affecting their partner by reducing inactivity later in life, while the labour supply of women does not adjust in response to shocks affecting their partners. These findings show that average responses among workers disguise important heterogeneity, highlighting the importance of the nature of shocks and the age and gender of affected workers when formulating policy.

**JEL Classification:** F14, F16, F66, J12, J16, L60

**Keywords:** Import Competition, Adjustments, Self-Employment, Retirement, Marital Dissolution, Added Worker Effects

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†Department of Economics, University of Essex (email: aitor.irastorza-fadrique@essex.ac.uk)
‡Institute for Fiscal Studies, London (email: peter_l@ifs.org.uk)
§School of Economics, University of Surrey (email: m.parey@surrey.ac.uk)

# 1 Introduction

Households can respond to negative labour demand shocks in a number of ways. Workers experiencing earnings losses can find alternative forms of employment or delay retirement to make up for them. Their partners can also provide insurance by entering the labour force or increasing their working hours (Blundell et al., 2016). This paper studies the responses of individual workers and their households to a negative labour demand shock resulting from rising import competition. Understanding how different workers and their families adapt to trade shocks, and how responses differ across them, is important for understanding the welfare implications of such shocks and for designing appropriate policy responses.

The analysis draws on the Office for National Statistics Longitudinal Study (LS). This is a large-scale panel dataset which contains linked census and life events data for a 1% sample of the population of England and Wales. This dataset offers three advantages over other (typically administrative) data used to study trade shocks. Most importantly, it contains information on the industry, occupation, hours worked and employment status not only of individuals but also other members of their households. Second, the LS follows individuals irrespective of their labour force status and records the reasons for inactivity (retirement, sickness, study etc.), unlike matched employer-employee datasets used for these sorts of exercises that do not typically distinguish between unemployment and other forms of non-participation. Finally, the LS has very large sample sizes and very low attrition rates due to the compulsory nature of the census, minimizing problems of sample representativeness and allowing us to follow individuals reliably even over long periods of time.

There is a growing literature that uses longitudinal administrative datasets to study worker-level effects of trade shocks (e.g., Autor et al. (2014); Utar (2018); De Lyon & Pessoa (2021); Citino & Linarello (2021); Dauth et al. (2021)). The evidence shows that workers initially employed in sectors highly exposed to import competition experienced lower income growth and lower employment compared to less exposed workers. They are also more likely to leave manufacturing and move to the service or non-traded sector. While studying employment and earnings profiles is important for understanding the effects of trade shocks (Helpman, 2018), these profiles do not capture the full extent of the ways individuals and households might try to make up for lost earnings. The use of the LS allows us to make several important contributions to our understanding of how workers adjust to negative demand shocks in general, and trade shocks specifically. Firstly, we can test for the 'added worker effects' among other household members in response to trade shocks, as well as the impact of these shocks on family formation and dissolution. Secondly, we can study retirement responses by older workers, and the degree to which workers adjust by extending their working lives or finding alternative forms of employment (e.g., self-employment). In both cases, we can examine how such responses vary by the age and gender of individuals and their partners.

To study households' adjustments to trade shocks, we exploit rising import competition from China in the early 2000s. As has been well-documented, this represented a substantial competitive shock for firms in developed countries (Autor et al., 2016). China accounted for about 4.5% of UK imports in 2001, more than doubling to around 10% in 2011. The extent of that import competition however varied across industries, even within narrow sectors such as textiles and apparel. Combining this industry-level variation with longitudinal UK census data from 2001 to 2011, we document workers' labour market and household adjustments to a negative labour demand shock resulting from rising import competition.

The exposure to the trade shock at the individual level is measured as the growth in UK imports from China over 2001 to 2011 that occurred in a worker's initial industry of employment, instrumented using import growth in other high-income countries.[1] Comparing outcomes for workers facing larger and lower exposure to import competition after a decade (controlling for industry, occupation, and location fixed effects), we uncover a varied pattern of employment and household adjustments. Gender and age play major roles in determining how workers respond to trade shocks and how they make these adjustments.

We present four sets of results. We start by showing that increased import competition with China was a major labour market shock in the UK, especially for male workers. Consistent with existing literature, we find strong and statistically significant evidence that workers initially employed in industries exposed to rising import competition experience a lower probability of being employed in manufacturing and a higher probability of being unemployed compared to workers in industries less exposed to the trade shock. Male workers affected by the trade shock lose employment in blue-collar occupations disproportionately and also pick up more jobs in low-skilled and white-collar occupations, leading to employment polarisation. A different pattern emerges for females, who are less likely to report they work in white-collar occupations (professional occupations) and more likely in low-skilled occupations (sales and customer services) as a result of higher import competition.

Second, moves into self-employment and delaying retirement are potentially important forms of (self-)insurance against trade shocks for men, but not for women. We show that affected male workers are more likely to be self-employed relative to those not affected, with the effect being statistically stronger for younger workers. Older men who are initially employed in affected industries are also significantly less likely to be retired in the 10 years after the shock than comparable workers in less exposed industries. Delaying retirement is thus an additional adjustment margin to compensate for earnings losses associated with import shocks. This effect may have been missed in previous studies of the impacts of import competition, which often restrict their samples to those of working age for the whole sample period.[2]

[1] Our approach follows Autor et al. (2014). Data from the ONS Business Structure Database (BSD) and the United Nations (UN) Comtrade Database are used to construct this measure.

[2] Autor et al. (2014), for example, study a sample who are aged 22-64 over the period they consider, while Dauth et al. (2021) restrict their sample to individuals aged 22-54.

Third, turning to family level outcomes, we examine fertility and family dissolution responses to trade shocks. We find no evidence that import competition leads to lower or higher fertility. However, import competition leads to a reduction in the likelihood that affected women get divorced. This effect is driven by young women and there is an even larger reduction in divorce probabilities for young women with children. The reduced rate of divorce could be driven by insurance motivations (a so-called "retreat to family", Keller & Utar (2022)), as family breakdown could compound and amplify the initial impacts of the trade shock. Furthermore, we find that affected young women are less likely to find and live with a new partner than those not affected by import competition, with the effect being again stronger (in magnitude) for those initially with children. The marital status of men in exposed industries is, by contrast, unaffected. These effects differ from those found in the US, where exposure to Chinese import competition is associated with higher rates of family breakdown and lower marriage rates among young men (Autor et al. (2019)).

Our final set of results revolve around the influential literature on family labour supply, also known as the 'added worker effect' (Lundberg, 1985). Intra-household insurance is an important margin of adjustment that has been investigated in different contexts, but not in the context of trade shocks, which, rather than idiosyncratic job shocks or plant closures (the main focus so far), captures a large and permanent structural change in the economy.[3] In our sample of analysis, within-household exposure of partners tends to have a low correlation, meaning that in many cases where the census respondent in the LS experiences a large trade shock, the partner is employed in an industry which does not. This in turn suggests scope for intra-household insurance. We find that whereas men respond to trade shocks affecting their female partner by increasing labour force participation (driven by a large and significant increase in self-employment and in the form of longer working life, an 'encouraged worker effect'), the labour supply of women does not adjust in response to shocks affecting their partners. If anything, we find negative added worker effects for young women, meaning they are less likely to be in the labour force when their male partner is affected by the shock. This is consistent with earlier evidence for the UK (e.g., Bryan & Longhi (2018); Bredtmann et al. (2018)) and it might reflect the disincentive effect of the (means-tested) unemployment benefit system on women's labour force participation.[4] It might also reflect gender norms (in particular, the 'male breadwinner norm') which could limit the responsiveness of women to shocks affecting their partners (Bertrand et al., 2015).

[3]See, among others, Halla et al. (2020) in the context of a plant closure, Goux et al. (2014) in the context of a French reform and Bredtmann et al. (2018) in the context of the Great Recession.

[4]A disincentive effect of a husband's unemployment-related benefits on his wife's labor supply arises if the husband's benefits are linked to the wife's earnings, either because benefits are means-tested on the basis of family income or because any part of the benefit is withdrawn when the wife is working or earning. Individuals who are entitled to only a reduced rate of unemployment benefits when the partner receives some sort of income may be better off on unemployment allowance in the UK (Bredtmann et al., 2018).

These results are robust to several sensitivity checks, which include (i) controlling for additional industry- and occupation-level characteristics, (ii) accounting for export competition, (iii) considering trade with Eastern Europe as an additional potential shock, and (iv) using alternative country-groups in the instrument.

The rest of this document is structured as follows. Section 2 describes the ONS Longitudinal Study and other data sources we draw on. In section 3, we present our empirical and identification strategy. Section 4 shows the main results of the paper. Section 5 concludes.

# 2 Data

## 2.1 Longitudinal Study

Our analysis draws primarily on the ONS Longitudinal Study (LS). The LS is a panel dataset that links individuals across nation-wide censuses, conducted at 10 year intervals. The LS sample comprises individuals born on four selected birth dates (and thus roughly 1% of the population) in England and Wales across censuses conducted in 1971, 1981, 1991, 2001, and 2011. It contains basic demographic information as well as information on the employment status, occupation, industry and location of sample members and of members of their households. Some new members are added in each census.

Our use of the LS offers a number distinct advantages. First, the panel dimension of the dataset allows us to look at heterogeneity in individual responses, and to separate out the direct effects on individuals of shocks to their industry from any indirect effects of shocks impacting other industries in their local labour market. It thus allows for a richer analysis than studies that rely solely on regional-level variation in exposure to trade shocks (see, among others, Autor et al. (2013); Balsvik et al. (2015); Autor et al. (2019)).

Second, the LS also contains rich data on workers' occupation allowing us to directly examine the nature of job transitions following a trade shock. Moreover, unlike many administrative datasets that have been used in the literature, the LS continues to cover individuals who have become unemployed, self-employed or who have exited the labour force. Other administrative panel datasets (for example those used in Dauth et al. (2021); De Lyon & Pessoa (2021)) only cover employees and thus cannot distinguish (endogenous) moves into self-employment from job-loss, or unemployment from other forms of non-participation. As we discuss below, moves into self-employment appear to be a key adjustment margin for male workers.

Third, the LS contains information on other household members and therefore allows us to examine household-level responses to shocks. For instance, the LS allows us to examine the correlation between exposure to trade shocks across spouses, and the responses of partners to shocks affecting individual household members. To our knowledge, this has not been investigated before in the context of the China shock.

Finally, in contrast to many household-level survey data sets, participation in the census is a legal requirement and considerable resources are expended to maximise its coverage. The 2011 census had an estimated response rate of 94% (Office for National Statistics, 2015). This minimises problems of sample representativeness and attrition.

Our sample covers individuals aged 18-59 in 2001 and for whom their current industry of employment is observed. We further split the sample into young (those aged 18-44 in 2001) and old (those aged 45-59 in 2001) workers. Importantly for the retirement margin, it means that, by 2011, a number of individuals will be above the state pension age (for the period of analysis, 65 for men and 60 for women).

## 2.2 Business Structure Database

The BSD is an administrative dataset covering the employment, turnover, location and industry of all 'local units' (plants and offices) for UK firms whose turnover exceeds the threshold for VAT payments (£85,000 in 2016/17). In 2004 the BSD was estimated to account for almost 99% of economic activity in the UK.

We use the BSD for two purposes. The first is to estimate the output of different UK industries, which is calculated as the sum of firms' turnovers in each industry. The second is to calculate local exposure to import competition (which we plan to use for a local-level analysis). Local labour markets are defined using Travel to Work Areas (TTWAs).[5] The boundaries of TTWAs are specifically chosen by the UK Office for National Statistics (ONS) to ensure that most households who live in each area work within the same TTWA. Montresor (2019) develops a time-consistent definition of TTWAs across censuses, which are used to assign individuals to TTWAs based on the 2001 Census.

## 2.3 Other Data Sources

Data on trade flows are taken from the UN Comtrade database. The product codes from various years are mapped onto Classification of Product by Activity (CPA) codes which are identical in their first four digits to UK Standard Industry Classification codes.[6] Mappings from HS products codes to CPA industry codes are taken from the Eurostat RAMON Index of Correspondence Tables.[7] To construct measures of technological exposure we take data from the ONS on the size of industries' net capital stocks, and the proportion of this capital which is classified as ICT, Computing and R&D. We divide net capital stocks by output taken from the ONS Supply and Use Tables.[8]

[5] Geographical units analogous to Commuting Zones (CZ) in the US.

[6] We map product codes to UK four (and occasionally three) digit SIC 1992 codes.

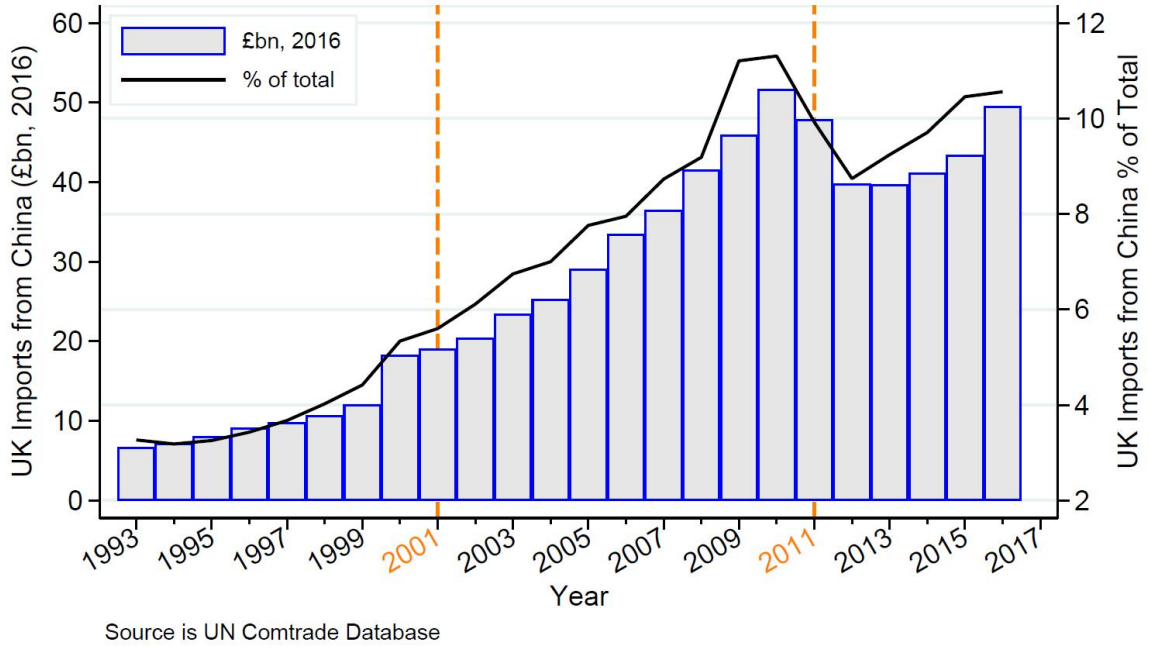
[7] See here: https://ec.europa.eu/eurostat/ramon/relations/index.cfm?TargetUrl=LST_REL

[8] These data come in the UK SIC 2007 industries. We map these to UK SIC 1992 industries using https://warwick.ac.uk/fac/soc/economics/staff/jcsmith/sicmapping/resources/proportional/.

# 3 Empirical & Identification Strategy

Our empirical strategy exploits variation in exposure of individual industries to the increase in import competition surrounding China's accession to the World Trade Organization (WTO) in 2001. The increase in Chinese imports to the UK is shown in Figure 1. China accounted for under 5% of UK imports in the early 2000s, which rose to 11% in 2010. This increase has been attributed to a number of supply factors including a reduction in trade uncertainty (Handley & Limao, 2017), a reduction in the tariffs China itself charged on inputs (Pierce & Schott, 2016; Amiti et al., 2020), the end of international agreements such as the multi-fibre agreement as well as rapid productivity growth in China.[9]

**Figure 1:** Import Competition UK-China, 1993-2016




Industry-level exposure is defined in the same way as Autor et al. (2014). That is, for industry $j$, exposure to import competition is defined as the growth in imports from China for each industry relative to that industry's total domestic sales, such that:

$$IE^{UK}_{j,2011-2001} = \frac{\Delta M^{China \rightarrow UK}_{j,2011-2001}}{Turnover_{j,2001} + Imports_{j,2001} - Exports_{j,2001}} \tag{1}$$

where IE is for Import Exposure. The numerator is the change in imports from China over the period 2001 to 2011, whereas the denominator is measured as industry output plus industry imports minus industry exports. The greatest increase in import exposure occurred in low-tech manufacturing sectors, which are generally linked to textiles, furniture and machinery production (among others, the manufacture of games and toys; luggage and handbags; sports goods; or radio, television and communication equipment). See Table A.1.

[9] China's rise over the past decades offers a rare opportunity to study the impacts of a large trade shock in developed economies (see Dorn & Levell (2021) for a summary).

A natural concern with this import exposure measure is that observed changes in imports could in part reflect domestic shocks to UK industries. To capture the China supply-driven component in UK imports from China, we follow Autor et al. (2014) and instrument for import exposure in Equation 1 with the variable

$$\widetilde{IE}_{j,2011-2001} = \frac{\Delta M^{China \rightarrow Other}_{j,2011-2001}}{Turnover_{j,1997} + Imports_{j,1997} - Exports_{j,1997}} \tag{2}$$

where $\Delta M^{China \rightarrow Other}_{j,2011-2001}$ is the change in imports from China from 2001 to 2011 in non-UK high-income countries.[10] To address possible sorting in anticipation of import changes, note that Equation 2 utilizes turnover, import and export levels from the year 1997. The motivation for the instrument is that these other countries are similarly exposed to growth in imports from China that is driven by China's accession to the WTO in 2001. The identifying assumption underlying the use of this instrument, for which there is ample support (Autor et al., 2014; Acemoglu et al., 2016), is that demand shocks are uncorrelated (or weakly correlated) across these countries for the period under consideration.[11]

***Estimation Strategy*** – Our baseline estimating equation is the following:

$$\Delta Y_{ij,t_1-t_0} = \alpha + \beta \widetilde{IE}_{j,t_1-t_0} + \delta X_{ij,t_0} + \gamma^{occ} + \gamma^{ind} + \gamma^{ttwa} + \epsilon_{ij,t_1-t_0} \tag{3}$$

where $i$ is for individual, $j$ is for industry, and $t_1 = 2011$ and $t_0 = 2001$. It follows that $\Delta Y_{ij,t_1-t_0}$ is the change in outcome $Y$ between 2001 and 2011 for individual $i$ who is initially employed in industry $j$. The coefficient of interest is $\beta$, which captures the effects of import exposure. The vector $X_{ij,t_0}$ contains (baseline) controls for worker's gender, five-year age groups and its interaction with worker's gender, and foreign-born status. Importantly, $\gamma^{occ}$, $\gamma^{ind}$, and $\gamma^{ttwa}$ include two-digit occupation (addressing potentially confounding technological factors), one-digit industry (to focus on variation within one-digit industries), and TTWA (location) fixed effects. Finally, $\epsilon_{ij,t_1-t_0}$ represents an idiosyncratic error term. Throughout the analysis, we cluster standard errors at the level of three-digit industries, thus allowing for correlation in error terms among workers who are initially employed in the same industry. We scale $\widetilde{IE}_{j,t_1-t_0}$ by the inter-quartile range of exposure across manufacturing workers. That means that a one-unit change in the estimates can be interpreted as moving a worker from the 25th to the 75th percentile in the exposure distribution among manufacturing workers. Implicitly, our analysis compares outcomes among individuals who were originally located in industries that differ in their exposure to import competition, but who are similar otherwise.

[10] These countries include Australia, Canada, Denmark, France, Germany, Italy, Japan, Spain, Switzerland, and the United States, for which trade data are available as comprehensively as for the UK.

[11] See Autor et al. (2013, 2014) for further discussion of threats to identification using this instrumentation approach. Autor et al. (2013, 2014) obtain similar results when they instead make use of inferred changes in China's productivity and trade costs relative to the US using residuals from a gravity-based strategy.

# 4 Main Results

In this section, we present our main results.[12] First, we study the effects of import exposure on employment forms and inactivity. We also study workers' occupational movements in response to the trade shock. We then estimate the effects of import exposure on several family outcomes, including divorce, fertility and new partnering. In the final subsection, we focus on the labour supply response of spouses to the import exposure of their partner.

## 4.1 Import Competition and Employment Forms

We start by considering several labour market outcomes in Table 1. We report the 2SLS estimates of the effects of import exposure on manufacturing employment (column 1), unemployment (column 2), being in work (column 3), employment (column 4), and self-employment (column 5) for all as well as separated for men and women. As outlined in section 3, each regression includes a set of industry, occupation and location (i.e., TTWA) fixed effects, in addition to baseline demographic characteristics.

**Table 1:** Import Competition and Employment Forms

| | (1) Δ manuf | (2) Δ unempl | (3) Δ in work | (4) Δ empl | (5) Δ self-emp |
|---|---|---|---|---|---|
| Import Exposure ALL | -7.483*** | 0.480** | -0.441 | -0.736 | 0.296 |
| | (2.243) | (0.235) | (0.410) | (0.604) | (0.282) |
| | [32.12] | [32.12] | [32.12] | [32.12] | [32.12] |
| | 168,797 | 168,797 | 168,797 | 168,797 | 168,797 |
| Import Exposure MEN | -7.410*** | 0.802*** | -0.219 | -1.116* | 0.897** |
| | (2.187) | (0.274) | (0.405) | (0.675) | (0.371) |
| | [29.23] | [29.23] | [29.23] | [29.23] | [29.23] |
| | 83,627 | 83,627 | 83,627 | 83,627 | 83,627 |
| Import Exposure WOMEN | -5.801** | 0.057 | -0.738 | -0.117 | -0.620 |
| | (2.314) | (0.309) | (0.577) | (0.721) | (0.388) |
| | [35.25] | [35.25] | [35.25] | [35.25] | [35.25] |
| | 85,170 | 85,170 | 85,170 | 85,170 | 85,170 |
| Controls | Yes | Yes | Yes | Yes | Yes |
| Ind, Occ, TTWA FE | Yes | Yes | Yes | Yes | Yes |

Standard errors clustered at industry level reported in parentheses.
First-stage F statistics reported in square brackets. Below is the sample size.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Source is ONS Longitudinal Study.

[12] We present descriptive statistics on baseline socio-demographic (e.g., age, education, marital status) and employment characteristics in Table A.2 (for the full sample) and Table A.3 (for manufacturing workers) as well as first-stage results for different samples in Table A.4 and Table A.5 in the Appendix.

For all employed workers, we find that the probability of being employed in manufacturing decreases significantly with import exposure. At the same time, the probability of unemployment increases. In terms of the magnitudes, recall that a one-unit change in the import exposure measure reflects the change from the 25th to the 75th percentile among manufacturing workers.[13] This intervention thus reduces the probability of being employed in manufacturing by 7.5 percentage points and increases the probability of being unemployed by 0.48 percentage points. Consistent with existing literature, this suggests that increased import competition with China was a major labour market shock in the UK. Turning to gender differences in these effects, the results show that the latter is especially true for men. However, we do not find that male workers initially employed in industries exposed to rising import competition are less likely to be in work compared to workers in industries less exposed to the trade shock. This follows from the fact that the reduction in employment is somewhat moderated by an increase in self-employment. In particular, the estimate implies that moving a worker from the 25th to the 75th percentile of the distribution among manufacturing workers increases the likelihood of working as self-employed by 0.9 percentage points for men. This is turn suggests that transitions into self-employment are an important mechanism for worker adjustment to trade shocks, which is true for men but not for women.

**Table 2:** Import Competition and Employment Forms

| | (1) Δ manuf | (2) Δ unempl | (3) Δ in work | (4) Δ empl | (5) Δ self-emp |
|---|---|---|---|---|---|
| Import Exposure | -8.946*** | 0.870** | -1.275*** | -2.041*** | 0.766** |
| YOUNG MEN | (2.520) | (0.357) | (0.396) | (0.686) | (0.401) |
| | 56,472 | 56,472 | 56,472 | 56,472 | 56,472 |
| Import Exposure | -5.018** | 0.717** | 1.581** | 0.564 | 1.018* |
| OLD MEN | (2.087) | (0.313) | (0.805) | (0.972) | (0.593) |
| | 27,155 | 27,155 | 27,155 | 27,155 | 27,155 |
| Import Exposure | -6.268*** | 0.317 | -0.997* | -0.312 | -0.685 |
| YOUNG WOMEN | (2.276) | (0.441) | (0.541) | (0.596) | (0.459) |
| | 56,800 | 56,800 | 56,800 | 56,800 | 56,800 |
| Import Exposure | -4.843* | -0.425** | -0.096 | 0.430 | -0.526 |
| OLD WOMEN | (2.726) | (0.199) | (1.075) | (1.254) | (0.443) |
| | 28,370 | 28,370 | 28,370 | 28,370 | 28,370 |
| Controls | Yes | Yes | Yes | Yes | Yes |
| Ind, Occ, TTWA FE | Yes | Yes | Yes | Yes | Yes |

Standard errors clustered at industry level reported in parentheses.
Below is the sample size. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source is ONS Longitudinal Study.

[13] Non manufacturing workers are not a useful comparison group since they have zero trade exposure.

We dig deeper into the analysis by showing the results separately by gender and age in Table 2. First, it reveals that the negative impacts of trade exposure on the different labour market outcomes are substantially larger for the young (those aged 18-44). Second, the null effect on being in work for male workers obtained in the previous table masks substantial differences by age. While affected young male workers are less likely to be in work compared to unaffected young male workers (mostly because increases to self-employment make up less of the overall employment loss), the opposite effect is true for old male workers, who are more likely to be in work in response to the trade shock.

We explore the latter finding in Table 3, where we investigate the impact of import exposure on inactivity for young and old male workers.[14] Interestingly, we find that whereas young male workers are more likely to be inactive following the trade shock (consistent with the idea of young male workers facing strong negative employment effects), old male workers are significantly less likely to be inactive and remain in the labour force (relative to comparable old male workers not affected by the trade shock). In columns 2-5, we decompose economic inactivity by several reasons: retirement, studying, being at home, sickness, and other reasons for inactivity. The key finding is that old male workers who are initially employed in affected industries are significantly less likely to be retired in the 10 years after the shock

**Table 3:** Import Competition and Inactivity

| | (1) Δ inactivity | (2) Δ retired | (3) Δ studying | (4) Δ at home | (5) Δ sickness | (6) Δ other |
|---|---|---|---|---|---|---|
| Import Exposure | -0.582* | -1.241*** | -0.064 | 0.362*** | 0.083 | 0.277*** |
| MEN | (0.348) | (0.348) | (0.053) | (0.128) | (0.177) | (0.096) |
| | [29.23] | [29.23] | [29.23] | [29.23] | [29.23] | [29.23] |
| | 83,627 | 83,627 | 83,627 | 83,627 | 83,627 | 83,627 |
| Import Exposure | 0.405** | -0.036 | -0.069 | 0.257** | 0.111 | 0.143 |
| YOUNG MEN | (0.206) | (0.121) | (0.073) | (0.112) | (0.167) | (0.102) |
| | [26.20] | [26.20] | [26.20] | [26.20] | [26.20] | [26.20] |
| | 56,472 | 56,472 | 56,472 | 56,472 | 56,472 | 56,472 |
| Import Exposure | -2.298** | -3.472*** | -0.057 | 0.590** | 0.079 | 0.562** |
| OLD MEN | (0.895) | (0.856) | (0.041) | (0.234) | (0.356) | (0.226) |
| | [35.32] | [35.32] | [35.32] | [35.32] | [35.32] | [35.32] |
| | 27,155 | 27,155 | 27,155 | 27,155 | 27,155 | 27,155 |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Ind, Occ, TTWA FE | Yes | Yes | Yes | Yes | Yes | Yes |

Standard errors clustered at industry level reported in parentheses.
First-stage F statistics reported in square brackets. Below is the sample size.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Source is ONS Longitudinal Study.

[14]The effect of trade exposure on inactivity for female workers (both young and old) is not statistically significant, and hence, the results are not reported here.

than comparable workers in less exposed industries. In terms of the magnitudes, moving a worker from the 25th to the 75th percentile of the distribution among manufacturing workers decreases the likelihood of retirement by 3.5 percentage points. Delaying retirement is thus an additional adjustment margin to compensate for earnings losses associated with import shocks. This effect may have been missed in previous studies of the impacts of trade competition, which restrict their samples to those of working age for the whole sample period.[15]

## 4.2 Import Competition and Occupations

The panel structure of the LS data allows us to follow individuals across censuses. This provides a unique opportunity to study the transitions across occupational groups over a ten-year horizon. The corresponding results are shown in Table 4, where we group occupations into white-collar, blue-collar and low-skill occupations based on 1-digit SOC codes.[16]

**Table 4:** Import Competition and Occupations

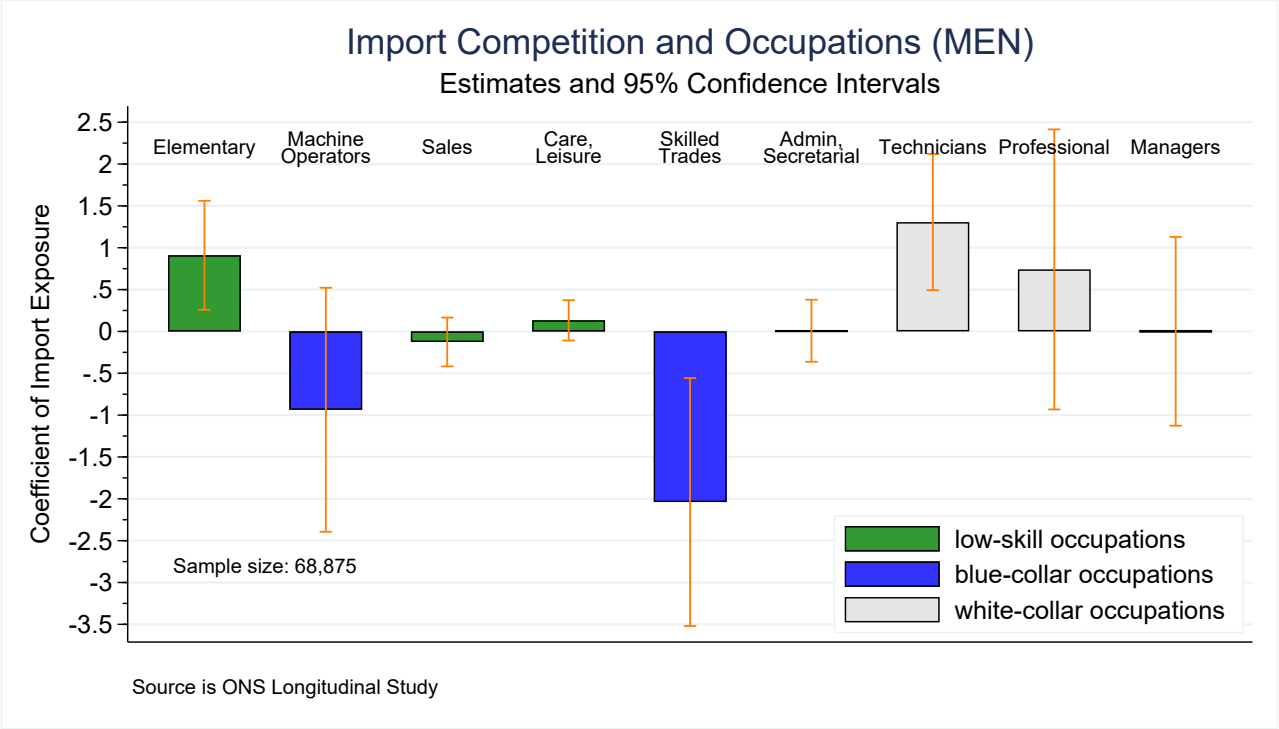
| | (1) Δ low-skill | (2) Δ blue-collar | (3) Δ white-collar |
|---|---|---|---|
| Import Exposure ALL | 1.465*** | -2.056*** | 0.590 |
| | (0.444) | (0.633) | (0.789) |
| | [31.00] | [31.00] | [31.00] |
| | 133,605 | 133,605 | 133,605 |
| Import Exposure MEN | 1.172** | -2.708*** | 1.536* |
| | (0.468) | (0.811) | (0.851) |
| | [28.21] | [28.21] | [28.21] |
| | 68,875 | 68,875 | 68,875 |
| Import Exposure WOMEN | 1.151* | 0.594 | -1.745** |
| | (0.611) | (0.531) | (0.816) |
| | [33.78] | [33.78] | [33.78] |
| | 64,730 | 64,730 | 64,730 |
| Controls | Yes | Yes | Yes |
| Ind, Occ, TTWA FE | Yes | Yes | Yes |

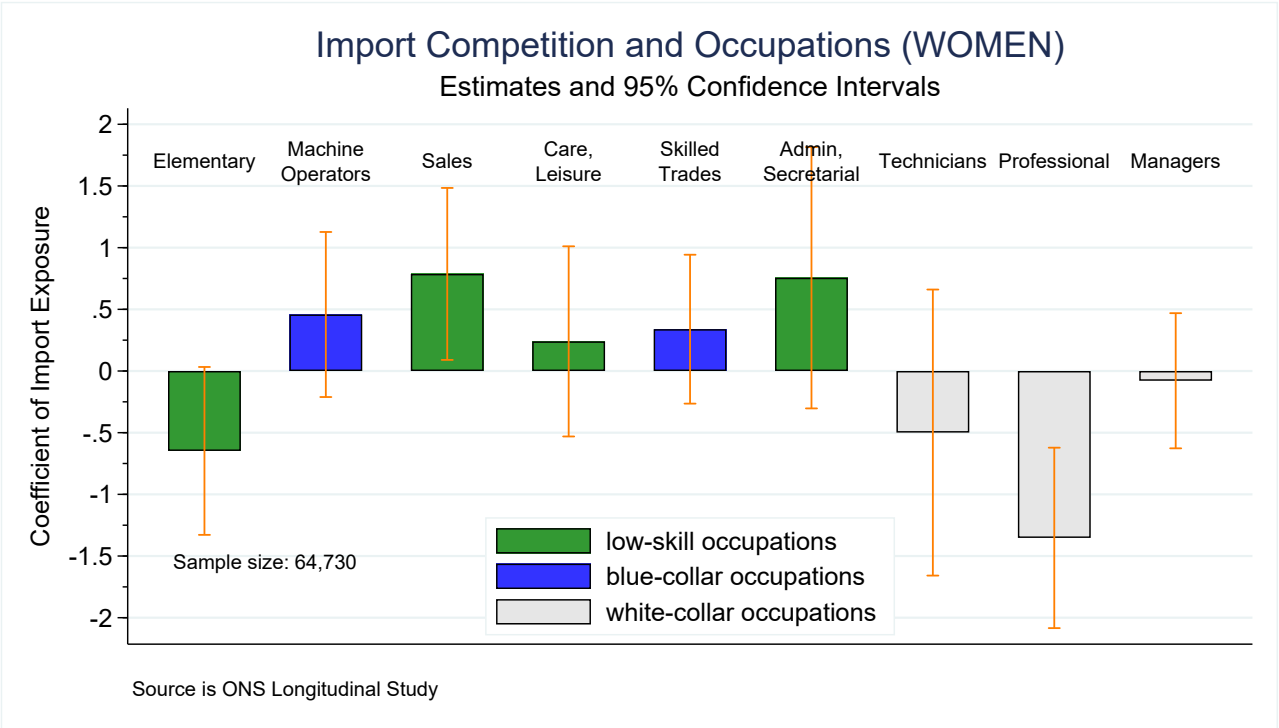
Standard errors clustered at industry level reported in parentheses.
First-stage F statistics in square brackets. Below is the sample size.
$^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Source is ONS Longitudinal Study.

[15] Autor et al. (2014), for example, study a sample who are aged 22-64 over the period they consider, while Dauth et al. (2021) restrict their sample to individuals aged 22-54.

[16] We define blue collar workers as those employed in "skilled trades occupations" and "process, plant and machine operatives". Low-skill workers are those employed in "administrative and secretarial occupations", "caring, leisure and other service occupations", "sales and customer service occupations" and "elementary occupations". Finally, white-collar workers are defined as those working in "managers, directors and senior officials", "professional occupations", and "associate professional and technical occupations".

**Figure 2:** Import Competition and Occupations



When all workers are considered, we see a significant and qualitatively large decrease in blue-collar occupations, and a corresponding increase in low-skill and white-collar occupations. However, this masks remarkable differences by gender. Importantly, we show that male workers affected by the trade shock lose employment in blue-collar occupations disproportionately and also pick up more jobs in low-skilled and white-collar occupations, leading to employment polarisation.[17] By contrast, a different pattern is observed for females, who are less likely to report they work in white-collar occupations and more likely to work in low-skilled occupations as a result of higher import competition.

We extend the analysis to consider 1-digit SOC codes. The results are shown in Figure 2, separately for men and women. Male workers lose employment in skilled trades occupations (e.g., motor mechanics; TV, radio and audio engineers; musical instrument makers) and find jobs in elementary occupations (e.g., waiters; labourers in building and woodworking trades; leisure and theme park attendants) and associate professional and technical occupations (e.g., air traffic controllers; vocational and industrial trainers and instructors; product, clothing and related designers). Females, by contrast, lose employment in professional occupations (e.g., design and development engineers; planning and quality control engineers) and go into sales and customer service occupations (e.g., merchandisers and window dressers; sales and retail assistants; customer care occupations).[18]

## 4.3 Import Competition and the Family

Using a local labour market approach, Autor et al. (2019) document how the negative impacts of labour market shocks induced by increasing import competition from China have negatively affected the marriage-market value of men, and in turn marriage and fertility rates in the US (i.e., trade leading to family breakdown). In a different setting with individual-level data, Keller & Utar (2022) find that Danish female workers (especially those in their late 30s) exposed to strong Chinese competition in the apparel sector increase fertility, and marry more than other comparable workers in the same sector (a so called 'retreat to family'). At present, little is known about whether these relationships are present in other developed countries with different trade-induced labour market shifts, and with different labour market institutions and welfare policies.

Table 5 displays the 2SLS estimates of the effects of import exposure on several family outcomes by gender and age: divorce (column 1), partnering (column 2), and fertility (column 3). We find heterogeneous impacts across the different subgroups of the sample.

[17] Keller & Utar (2021) also study the role of international trade in job polarization.

[18] It might also be the case that workers respond to trade shocks by moving to a new area. In non-tabulated results (available on request), we explore movements from one TTWA to another in response to trade shocks for different samples. We find that internal migration is not a primary margin of adjustment for workers in the UK. Autor et al. (2014) also conclude that migration is not a primary margin of adjustment for affected workers in the US. By contrast, Dauth et al. (2014) find evidence for internal migration in Germany.

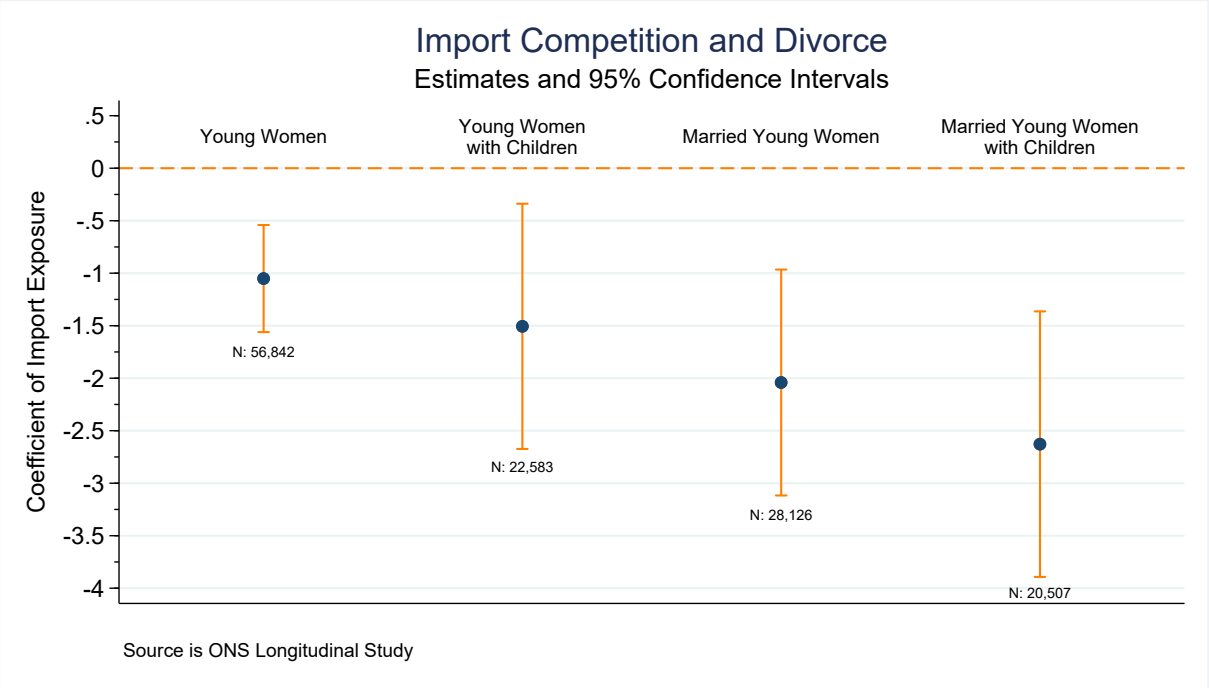
First, we find no evidence that import competition leads to lower or higher fertility. If anything, the estimated coefficient is positive, although it is not statistically significant in any of the samples considered. The key finding, however, is that import competition leads to a reduction in the likelihood that affected women get divorced (see column 1). As we show in the upper graph of Figure 3, this effect is driven by young women and there is an even larger reduction in divorce probabilities for young women with children. Restricting the sample to young women who are married in 2001 reinforces the previous finding. In terms of the magnitudes, moving a worker from the 25th to the 75th percentile of the distribution among manufacturing workers decreases the likelihood that affected young women with children get divorced by 1.5 percentage points. When restricting to married young women with children, the estimate increases to 2.6 pp. This means that the divorce impact of the shock is likely to be driven by insurance motivations, as family breakdown could compound and amplify the initial impacts of the trade shock. Furthermore, we find that affected young women are less likely to find and live with a new partner than those not affected by import competition (see column 2 in Table 5), with the effect being again stronger for those initially with children (see the bottom graph in Figure 3). The marital status and (new) partnering probabilities of men in exposed industries seems, by contrast, to be unaffected.

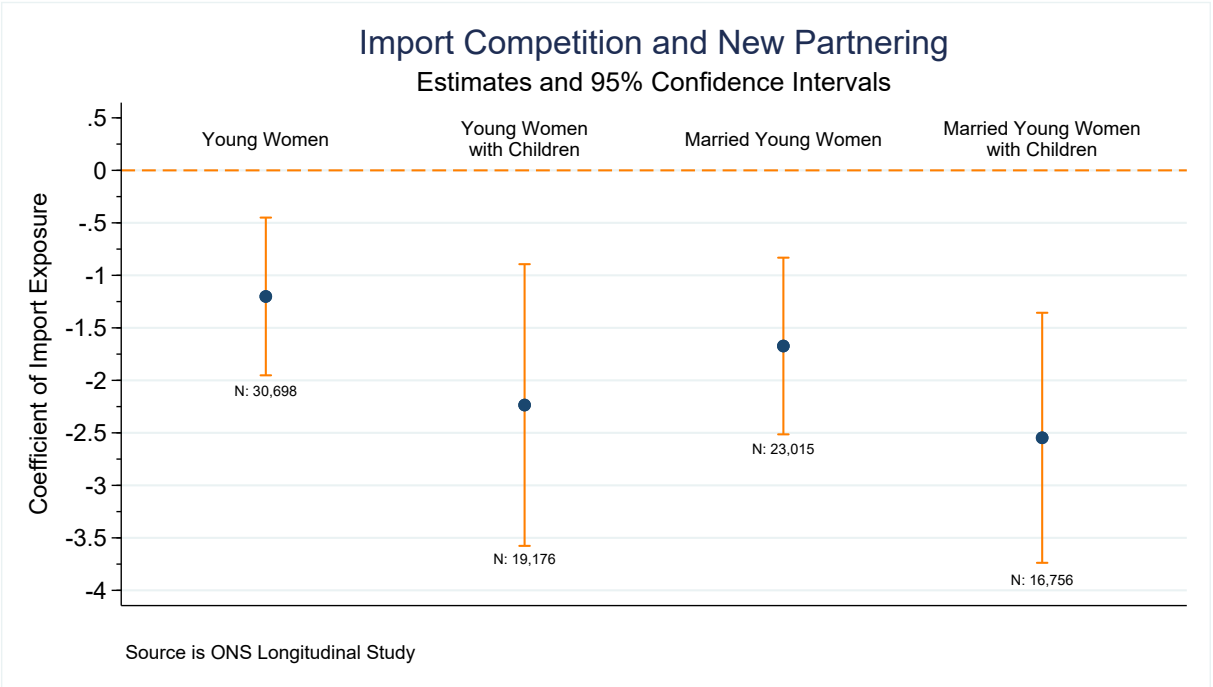
**Table 5:** Import Competition and the Family

| | (1)<br>$\Delta$ divorced | (2)<br>$\Delta$ new partner | (3)<br>$\Delta$ fertility |
|---|---|---|---|
| Import Exposure | -0.448 | 0.651 | 0.450 |
| YOUNG MEN | (0.381) | (0.553) | (0.542) |
| | 56,502 | 30,699 | 56,502 |
| Import Exposure | 1.068 | -0.856 | 0.460 |
| OLD MEN | (0.764) | (0.618) | (0.462) |
| | 27,163 | 21,184 | 27,163 |
| Import Exposure | -1.051*** | -1.201*** | 0.014 |
| YOUNG WOMEN | (0.311) | (0.458) | (0.971) |
| | 56,842 | 30,698 | 56,842 |
| Import Exposure | 0.474 | 0.013 | 0.666 |
| OLD WOMEN | (0.409) | (0.320) | (0.480) |
| | 28,376 | 19,647 | 28,376 |
| Controls | Yes | Yes | Yes |
| Ind, Occ, TTWA FE | Yes | Yes | Yes |

Standard errors clustered at industry level reported in parentheses.
Below is the sample size. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source is ONS Longitudinal Study.

**Figure 3:** Family Adjustments in Response to Trade Shocks



## 4.4 Import Competition and Added Worker Effects

When one partner is affected by the trade shock, the second partner could provide insurance by adjusting their labour supply (Blundell et al., 2016). However, gender norms and role models might limit the flexibility of spouses to respond to changes in economic conditions (Bertrand et al., 2015). In this section, we focus on the labour supply response of spouses to the import exposure of their partner. As shown in Table A.6, within-household exposure of partners tends to have a (relatively) low correlation in our sample of analysis, meaning that in many cases where the census respondent in the LS experiences a large trade shock, the partner is employed in an industry which experiences a very different trade shock.[19] This in turn suggests that spouses may potentially provide insurance to the trade shock.

Table 6 shows the results separately for men and women.[20] We start by investigating how import exposure of male LS members affects the labour supply behaviour of their female spouses. We do not find statistically significant effects on the different dimensions of labour supply here. If anything, the estimates for being in work, employment and self-employment are negative, and the estimate for the impact of import exposure on unemployment positive, but they are not statistically significant. However, when we look at the trade exposure of female LS members, we find strong and significant effects on labour force participation of their male spouses, mostly in the form of self-employment and longer working life.

**Table 6:** Partner Employment Effects

| | (1) Δ partner in work | (2) Δ partner active | (3) Δ partner empl | (4) Δ partner self emp | (5) Δ partner unempl |
|---|---|---|---|---|---|
| Import Exposure MEN | -1.074 | -0.752 | -0.753 | -0.320 | 0.322 |
| | (1.069) | (0.815) | (1.168) | (0.362) | (0.389) |
| | [33.32] | [33.32] | [33.32] | [33.32] | [33.32] |
| | 40,429 | 40,429 | 40,429 | 40,429 | 40,429 |
| Import Exposure WOMEN | 1.522*** | 1.275** | 0.074 | 1.448*** | -0.247 |
| | (0.459) | (0.506) | (0.726) | (0.470) | (0.354) |
| | [34.29] | [34.29] | [34.29] | [34.29] | [34.29] |
| | 46,543 | 46,543 | 46,543 | 46,543 | 46,543 |
| Controls | Yes | Yes | Yes | Yes | Yes |
| Ind, Occ, TTWA FE | Yes | Yes | Yes | Yes | Yes |
| Partner FE | Yes | Yes | Yes | Yes | Yes |

Standard errors clustered at industry level reported in parentheses.
First-stage F statistics reported in square brackets. Below is the sample size.
$^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Source is ONS Longitudinal Study.

[19] The correlation is always below 0.3.

[20] The regression model includes a partner fixed effect, accounting for partners' 1 digit industry. We restrict the sample to those whose partner is active in 2001. Recall that only heterosexual couples are considered. We discuss various robustness checks below.

We look at some further heterogeneity in Table 7. We highlight two important results. First, we find that men respond to trade shocks affecting their partner by increasing their participation in the labour force, driven by an increase in self-employment when young and by reducing inactivity (especially) at older ages.[21] This evidence suggests that import competition induces some 'encourage worker effects' for men. Second, we find negative 'added worker effects' for young women, as they are less likely to be in the labour force when their male partner is affected by the trade shock. This finding is in line with earlier UK evidence (Bryan & Longhi, 2018; Bredtmann et al., 2018) and it might reflect the disincentive effect of the (means-tested) unemployment benefit system on women's labour force participation. It might also reflect gender norms (e.g., the 'male breadwinner norm') which could limit the responsiveness of women to shocks affecting their partners (Bertrand et al., 2015).

**Table 7:** Partner Employment Effects

| | (1) Δ partner in work | (2) Δ partner active | (3) Δ partner empl | (4) Δ partner self emp | (5) Δ partner unempl |
|---|---|---|---|---|---|
| Import Exposure | -1.590** | -0.976** | -1.207 | -0.383 | 0.614 |
| YOUNG MEN | (0.693) | (0.383) | (0.947) | (0.550) | (0.510) |
| | 23,870 | 23,870 | 23,870 | 23,870 | 23,870 |
| Import Exposure | -0.264 | -0.442 | 0.091 | -0.356 | -0.178 |
| OLD MEN | (1.996) | (1.859) | (1.730) | (0.605) | (0.355) |
| | 16,559 | 16,559 | 16,559 | 16,559 | 16,559 |
| Import Exposure | 1.264** | 0.822** | -0.364 | 1.628** | -0.443 |
| YOUNG WOMEN | (0.526) | (0.371) | (1.160) | (0.806) | (0.424) |
| | 29,347 | 29,347 | 29,347 | 29,347 | 29,347 |
| Import Exposure | 2.242** | 2.360** | 1.174 | 1.067 | 0.119 |
| OLD WOMEN | (0.896) | (1.146) | (1.035) | (0.881) | (0.757) |
| | 17,196 | 17,196 | 17,196 | 17,196 | 17,196 |
| Controls | Yes | Yes | Yes | Yes | Yes |
| Ind, Occ, TTWA FE | Yes | Yes | Yes | Yes | Yes |
| Partner FE | Yes | Yes | Yes | Yes | Yes |

Standard errors clustered at industry level reported in parentheses.
First-stage F statistics reported in square brackets. Below is the sample size.
$^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Source is ONS Longitudinal Study.

[21] Recall that these results are based on the partner being active in 2001. That means they remain longer in work rather than movements from inactivity.

***Robustness of the Main Results*** – We show in Table A.7 and Table A.8 that these results are robust to several sensitivity checks, which include (i) controlling for additional industry- and occupation-level characteristics, (ii) accounting for export competition, (iii) considering trade with Eastern Europe as an additional potential shock, and (iv) using alternative country-groups in the instrument. In addition, Table A.9 shows that the partner analysis in section 4.4 is robust to (i) restricting the sample to those who remain with the same partner in 2011, (ii) restricting the sample to those whose partner is not exposed to import competition, and (iii) controlling for additional partner characteristics. Finally, Table A.10 and Table A.11 report the results for the placebo exercise as well as further robustness checks controlling for retirement dynamics in the 1980s.

# 5 Conclusion

Understanding the ways households adjust to large-scale trade shocks is important for many reasons. To fully understand the individual-level career and labour market implications, it is important to investigate the long-run transitions that workers go through in response to trade shocks, including movements to alternative forms of employment such as self-employment or movements to/from (in)activity. Furthermore, the households of affected workers might be able to offer insurance through adjusting their labour market supply choices. Policy-makers need to understand full adjustments – employment *and* household adjustments – for designing appropriate policy responses in mediating the effects of such shocks, both employment-oriented and family-oriented policy responses.

This paper uses data from the ONS Longitudinal Study and exploits rising import competition from China to investigate these questions for workers and households in England and Wales. We uncover a varied pattern of employment and household adjustments. We show that affected male workers are significantly more likely to be self-employed and significantly less likely to be retired in the 10 years after the shock relative to those not affected. Import competition also leads to a reduction in the likelihood that affected women get divorced or find a new partner. As for intra-household adjustments, men respond to trade shocks affecting their partner by increasing labour force participation (driven by an increase in self-employment and in the form of longer working life, 'encouraged worker effects'), while the labour supply of women does not adjust in response to shocks affecting their partners.

These findings underline three important points. First, the importance of investigating household-level responses to trade shocks (i.e., family dissolution/formation, 'added worker effects'). Second, the relevance of self-employment and longer working life as potential adjustment margins to large-scale trade shocks, both for workers in affected industries as well as for their partners. Finally, these findings show that average responses among workers disguise important heterogeneity, highlighting the importance of the nature of shocks and the age and gender of affected workers when formulating policy.

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ONLINE APPENDIX:

# Alternative Margins of Adjustment to Trade Shocks: Self-Employment, Delayed Retirement, and Added Worker Effects

Aitor Irastorza-Fadrique, Peter Levell & Matthias Parey

# A Tables

**Table A.1:** Top 20 Industries Most Exposed to Import Competition.

| **Industry** (UK SIC92 classification) | **Employment Share, %** (all manufacturing industries) |
|---|---|
| Games and Toys | 0.30 |
| Luggage, Handbags | 0.11 |
| Footwear | 0.38 |
| Leather | - |
| Transport Equipment not elsewhere classified | - |
| Sports Goods | 0.15 |
| Wearing Apparel; Dressing and Dyeing of Fur | 2.45 |
| Domestic Appliances not elsewhere classified | 0.82 |
| Office Machinery and Computers | 1.57 |
| Manufacturing not otherwise specified | 1.90 |
| Radio, Television and Communication Equipment | 2.81 |
| Furniture | 3.74 |
| Miscellaneous Manufacturing not elsewhere classified | 1.41 |
| Textiles | 3.46 |
| Cutting, Shaping and Finishing of Stone | 0.11 |
| Musical Instruments | 0.10 |
| Rubber Products | 0.94 |
| Refractory Ceramic Products | 0.78 |
| Electrical Machinery not elsewhere classified | 4.18 |
| Glass and Glass Products | 0.91 |

Sample in these 20 industries is 34,572. Source is ONS Longitudinal Study.

**Table A.2:** Descriptive Statistics on Baseline Characteristics (import exposure, demographics, employment). Workers in All vs. Manufacturing Industries (in 2001)

| | ALL WORKERS | | MEN | | WOMEN | |
|---|---|---|---|---|---|---|
| | All Industries | Manuf. Industries | All Industries | Manuf. Industries | All Industries | Manuf. Industries |
| Import Exposure | 0.65 | 3.91 | 0.77 | 3.58 | 0.51 | 4.76 |
| P90, P10 interval | [1.62, 0.00] | [10.00, 0.07] | [2.38, 0.00] | [9.82, 0.04] | [0.21, 0.00] | [11.92, 0.18] |
| P75, P25 interval | [0.00, 0.00] | [6.04, 0.22] | [0.00, 0.00] | [4.37, 0.22] | [0.00, 0.00] | [8.85, 0.35] |
| Female | 0.466 | 0.274 | 0.000 | 0.000 | 1.000 | 1.000 |
| Age | 38.898 | 39.454 | 38.986 | 39.672 | 38.798 | 38.877 |
| Hours Worked | 37.795 | 40.718 | 42.893 | 42.693 | 31.953 | 35.494 |
| Foreign | 0.102 | 0.087 | 0.104 | 0.079 | 0.099 | 0.108 |
| Education | 0.264 | 0.188 | 0.261 | 0.193 | 0.267 | 0.175 |
| Single | 0.318 | 0.302 | 0.336 | 0.300 | 0.298 | 0.308 |
| Married | 0.585 | 0.606 | 0.586 | 0.617 | 0.583 | 0.575 |
| Widowed | 0.009 | 0.007 | 0.005 | 0.005 | 0.015 | 0.013 |
| Divorced | 0.088 | 0.085 | 0.073 | 0.078 | 0.104 | 0.103 |
| Has Children | 0.424 | 0.412 | 0.422 | 0.432 | 0.427 | 0.358 |
| Has Partner | 0.685 | 0.716 | 0.689 | 0.722 | 0.681 | 0.697 |
| Has Young Children | 0.141 | 0.144 | 0.155 | 0.155 | 0.126 | 0.117 |
| Employed | 0.871 | 0.926 | 0.827 | 0.922 | 0.921 | 0.937 |
| Self-employed | 0.129 | 0.074 | 0.173 | 0.078 | 0.079 | 0.063 |
| Part-time | 0.230 | 0.082 | 0.075 | 0.026 | 0.407 | 0.228 |
| Low-skill | 0.389 | 0.206 | 0.222 | 0.138 | 0.581 | 0.386 |
| Blue-collar | 0.205 | 0.455 | 0.332 | 0.507 | 0.058 | 0.319 |
| White-collar | 0.406 | 0.339 | 0.445 | 0.355 | 0.360 | 0.296 |
| Managers (occ1) | 0.155 | 0.164 | 0.189 | 0.179 | 0.114 | 0.122 |
| Professionals (occ2) | 0.112 | 0.065 | 0.121 | 0.076 | 0.102 | 0.036 |
| Technicians (occ3) | 0.139 | 0.110 | 0.134 | 0.099 | 0.144 | 0.137 |
| Administrative (occ4) | 0.136 | 0.083 | 0.053 | 0.028 | 0.229 | 0.227 |
| Skilled trades (occ5) | 0.117 | 0.203 | 0.198 | 0.253 | 0.025 | 0.069 |
| Caring, leisure (occ6) | 0.071 | 0.002 | 0.019 | 0.001 | 0.129 | 0.004 |
| Sales and customer (occ7) | 0.071 | 0.018 | 0.037 | 0.008 | 0.110 | 0.046 |
| Machine operatives (occ8) | 0.087 | 0.252 | 0.134 | 0.254 | 0.033 | 0.249 |
| Elementary (occ9) | 0.112 | 0.103 | 0.112 | 0.101 | 0.112 | 0.107 |
| Partner age | 42.255 | 41.047 | 40.466 | 40.282 | 43.942 | 43.146 |
| Partner active | 0.806 | 0.823 | 0.735 | 0.784 | 0.873 | 0.929 |
| Partner in work | 0.782 | 0.805 | 0.715 | 0.766 | 0.845 | 0.911 |
| Partner employed | 0.664 | 0.730 | 0.652 | 0.722 | 0.674 | 0.752 |
| Partner self-employed | 0.118 | 0.075 | 0.063 | 0.044 | 0.171 | 0.158 |
| Partner unemployed | 0.024 | 0.018 | 0.020 | 0.018 | 0.028 | 0.018 |
| Partner manufacturing | 0.167 | 0.246 | 0.105 | 0.180 | 0.224 | 0.422 |
| Partner hours worked | 27.808 | 25.613 | 19.569 | 20.685 | 35.570 | 39.136 |
| **Sample size** | **223,558** | **34,539** | **119,377** | **25,062** | **104,181** | **9,477** |
| **(with partner)** | **(194,002)** | **(24,683)** | **(94,111)** | **(18,090)** | **(99,891)** | **(6,593)** |

This table shows descriptive statistics on baseline (2001) characteristics which include summary statistics for the import exposure (the mean and percentiles), mean age, fraction of people with college education, fraction of foreign-born people, mean hours worked, marital distribution, occupational distribution and partners' employment characteristics. Source is ONS Longitudinal Study.

**Table A.3:** Descriptive Statistics on Baseline Characteristics (age, marital status, employment). Manufacturing Workers. High vs. Low Exposed (in 2001)

| | ALL WORKERS | | MEN | | WOMEN | |
|---|---|---|---|---|---|---|
| | Low Exposed | High Exposed | Low Exposed | High Exposed | Low Exposed | High Exposed |
| Female | 0.250 | 0.343 | 0.000 | 0.000 | 1.000 | 1.000 |
| Age | 39.473 | 39.399 | 39.834 | 39.149 | 38.390 | 39.878 |
| Hours Worked | 40.939 | 40.093 | 42.788 | 42.388 | 35.394 | 35.700 |
| Foreign | 0.077 | 0.115 | 0.071 | 0.105 | 0.095 | 0.136 |
| Education | 0.196 | 0.163 | 0.195 | 0.186 | 0.200 | 0.121 |
| Single | 0.303 | 0.299 | 0.297 | 0.311 | 0.322 | 0.277 |
| Married | 0.605 | 0.607 | 0.620 | 0.607 | 0.560 | 0.607 |
| Widowed | 0.007 | 0.008 | 0.005 | 0.003 | 0.012 | 0.017 |
| Divorced | 0.084 | 0.085 | 0.077 | 0.078 | 0.105 | 0.099 |
| Has Children | 0.412 | 0.410 | 0.433 | 0.429 | 0.351 | 0.373 |
| Has Partner | 0.718 | 0.709 | 0.728 | 0.706 | 0.688 | 0.716 |
| Has Young Children | 0.144 | 0.147 | 0.151 | 0.168 | 0.121 | 0.106 |
| Employed | 0.935 | 0.900 | 0.930 | 0.897 | 0.951 | 0.907 |
| Self-employed | 0.065 | 0.099 | 0.069 | 0.103 | 0.048 | 0.093 |
| Low-skill | 0.209 | 0.196 | 0.139 | 0.133 | 0.419 | 0.316 |
| Blue-collar | 0.439 | 0.499 | 0.505 | 0.512 | 0.248 | 0.475 |
| White-collar | 0.351 | 0.305 | 0.355 | 0.355 | 0.337 | 0.209 |
| Managers (occ1) | 0.165 | 0.160 | 0.175 | 0.193 | 0.135 | 0.098 |
| Professionals (occ2) | 0.068 | 0.056 | 0.077 | 0.074 | 0.041 | 0.023 |
| Technicians (occ3) | 0.118 | 0.088 | 0.103 | 0.088 | 0.161 | 0.088 |
| Administrative (occ4) | 0.086 | 0.074 | 0.029 | 0.024 | 0.255 | 0.171 |
| Skilled trades (occ5) | 0.204 | 0.199 | 0.255 | 0.248 | 0.052 | 0.106 |
| Caring, leisure (occ6) | 0.002 | 0.002 | 0.001 | 0.001 | 0.005 | 0.004 |
| Sales and customer (occ7) | 0.018 | 0.019 | 0.008 | 0.008 | 0.049 | 0.041 |
| Machine operatives (occ8) | 0.236 | 0.300 | 0.250 | 0.264 | 0.191 | 0.369 |
| Elementary (occ9) | 0.103 | 0.100 | 0.100 | 0.100 | 0.111 | 0.099 |
| Partner age | 41.040 | 41.241 | 40.499 | 39.728 | 42.754 | 44.099 |
| Partner active | 0.824 | 0.820 | 0.791 | 0.763 | 0.930 | 0.927 |
| Partner employed | 0.737 | 0.711 | 0.729 | 0.697 | 0.759 | 0.739 |
| Partner self-employed | 0.069 | 0.089 | 0.043 | 0.047 | 0.154 | 0.167 |
| Partner unemployed | 0.018 | 0.019 | 0.018 | 0.019 | 0.017 | 0.021 |
| Partner manufacturing | 0.233 | 0.282 | 0.175 | 0.199 | 0.416 | 0.435 |
| Partner hours worked | 25.176 | 26.673 | 20.738 | 20.358 | 39.248 | 38.590 |
| **Sample size** | **25,510** | **9,029** | **19,131** | **5,931** | **6,379** | **3,098** |
| **(with partner)** | **(18,288)** | **(6,390)** | **(13,907)** | **(4,178)** | **(4,381)** | **(2,212)** |

This table shows descriptive statistics on baseline (2001) characteristics which include mean age, fraction of people with college education, fraction of foreign-born people, mean hours worked, marital distribution, occupational distribution and partners' employment characteristics. Source is ONS Longitudinal Study.

**Table A.4:** First-Stage Regressions (All)

| | Panel A: All | | |
|---|---|---|---|
| Import Exposure IV | 1.038*** | 1.033*** | 1.034*** |
| | (0.159) | (0.182) | (0.179) |
| $R^2$ | 0.744 | 0.769 | 0.772 |
| Sample Size | 194,671 | 166,581 | 114,422 |
| Controls | No | Yes | Yes |
| Ind, Occ, TTWA FE | No | Yes | Yes |
| Partner FE | No | No | Yes |

Standard errors clustered at industry level.
$^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$
Source is ONS Longitudinal Study.

**Table A.5:** First-Stage Regressions (by gender and age)

| | Panel A: Men | | | Panel B: Young Men | | | Panel C: Old Men | | |
|---|---|---|---|---|---|---|---|---|---|
| Import Exposure IV | 0.981*** | 0.972*** | 0.974*** | 0.987*** | 0.981*** | 0.987*** | 0.968*** | 0.951*** | 0.952*** |
| | (0.152) | (0.180) | (0.173) | (0.158) | (0.191) | (0.184) | (0.143) | (0.161) | (0.157) |
| $R^2$ | 0.718 | 0.739 | 0.743 | 0.722 | 0.741 | 0.746 | 0.708 | 0.739 | 0.741 |
| Sample Size | 98,676 | 82,438 | 56,801 | 67,384 | 55,616 | 34,216 | 31,292 | 26,822 | 22,585 |
| | **Panel D: Women** | | | **Panel E: Young Women** | | | **Panel F: Old Women** | | |
| Import Exposure IV | 1.138*** | 1.126*** | 1.128*** | 1.112*** | 1.107*** | 1.115*** | 1.189*** | 1.160*** | 1.146*** |
| | (0.176) | (0.189) | (0.192) | (0.179) | (0.197) | (0.203) | (0.171) | (0.182) | (0.182) |
| $R^2$ | 0.787 | 0.818 | 0.818 | 0.781 | 0.810 | 0.809 | 0.801 | 0.834 | 0.834 |
| Sample Size | 95,995 | 84,143 | 57,621 | 64,281 | 56,143 | 35,650 | 31,714 | 28,000 | 21,971 |
| Controls | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Ind, Occ, TTWA FE | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Partner FE | No | No | Yes | No | No | Yes | No | No | Yes |

Standard errors clustered at industry level reported in parentheses.
$^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Source is ONS Longitudinal Study.

**Table A.6:** Import Exposure within Households

| | **Correlation with partner's exposure** | |
|---|---|---|
| | All Industries | Manufacturing |
| All | 0.220 | 0.216 |
| | 151,228 | 19,836 |
| Men | 0.165 | 0.181 |
| | 67,190 | 13,849 |
| Women | 0.274 | 0.243 |
| | 84,038 | 5,987 |
| Young Men | 0.142 | 0.175 |
| | 38,290 | 8,145 |
| Young Women | 0.265 | 0.263 |
| | 53,348 | 3,892 |
| Old Men | 0.197 | 0.189 |
| | 28,900 | 5,704 |
| Old Women | 0.288 | 0.209 |
| | 30,690 | 2,095 |

Sample size reported below the correlation coefficient.
Source is ONS Longitudinal Study.

## Table A.7: Robustness Checks. Men.

| | (1) Baseline estimates | (2) excluding Germany | (3) excluding Germany, US | (4) excluding EU countries | (5) adding ind controls | (6) adding occ controls | (7) accounting for Easter Europe | (8) accounting for exports |
|---|---|---|---|---|---|---|---|---|
| **Panel A: Manufacturing employment** | | | | | | | | |
| Men | -7.410*** | -7.399*** | -6.829*** | -7.587*** | -7.495*** | -7.424*** | -6.433** | -7.269*** |
| | (2.187) | (2.150) | (2.047) | (2.223) | (2.149) | (2.186) | (2.575) | (2.271) |
| Young Men | -8.946*** | -8.983*** | -8.166*** | -9.264*** | -9.132*** | -8.952*** | -8.272*** | -8.645*** |
| | (2.520) | (2.480) | (2.353) | (2.605) | (2.525) | (2.517) | (2.804) | (2.591) |
| Old Men | -5.018** | -4.985** | -4.805** | -5.024** | -4.919** | -5.056** | -3.524 | -5.065** |
| | (2.087) | (2.037) | (1.985) | (2.032) | (1.968) | (2.086) | (2.607) | (2.147) |
| **Panel B: Unemployment** | | | | | | | | |
| Men | 0.802*** | 0.796*** | 0.688*** | 0.830*** | 0.816*** | 0.811*** | 0.738** | 0.769*** |
| | (0.274) | (0.269) | (0.256) | (0.288) | (0.281) | (0.273) | (0.350) | (0.261) |
| Young Men | 0.870** | 0.867** | 0.701** | 0.913** | 0.884** | 0.885** | 0.804* | 0.789** |
| | (0.357) | (0.354) | (0.317) | (0.383) | (0.366) | (0.356) | (0.456) | (0.347) |
| Old Men | 0.717** | 0.706** | 0.716** | 0.721** | 0.714** | 0.717** | 0.627 | 0.748** |
| | (0.313) | (0.309) | (0.312) | (0.313) | (0.324) | (0.315) | (0.383) | (0.339) |
| **Panel C: In Work** | | | | | | | | |
| Men | -0.219 | -0.263 | -0.140 | -0.298 | -0.326 | -0.240 | 0.079 | -0.259 |
| | (0.405) | (0.399) | (0.367) | (0.420) | (0.419) | (0.403) | (0.539) | (0.427) |
| Young Men | -1.275*** | -1.336*** | -1.195*** | -1.394*** | -1.315*** | -1.301*** | -1.079** | -1.201*** |
| | (0.396) | (0.384) | (0.369) | (0.394) | (0.414) | (0.395) | (0.530) | (0.387) |
| Old Men | 1.581** | 1.570** | 1.656** | 1.606** | 1.438* | 1.572** | 2.046** | 1.404* |
| | (0.805) | (0.787) | (0.813) | (0.807) | (0.832) | (0.798) | (0.978) | (0.798) |
| **Panel D: Employment** | | | | | | | | |
| Men | -1.116* | -1.134* | -0.893 | -1.179* | -1.004 | -1.121* | -1.312 | -1.059 |
| | (0.675) | (0.666) | (0.618) | (0.697) | (0.676) | (0.668) | (0.851) | (0.688) |
| Young Men | -2.041*** | -2.104*** | -1.880*** | -2.138*** | -1.842*** | -2.064*** | -2.206** | -1.845*** |
| | (0.686) | (0.660) | (0.658) | (0.670) | (0.663) | (0.685) | (0.923) | (0.702) |
| Old Men | 0.564 | 0.654 | 0.923 | 0.630 | 0.612 | 0.607 | 0.237 | 0.444 |
| | (0.972) | (0.985) | (0.923) | (1.064) | (1.024) | (0.957) | (1.056) | (0.999) |
| **Panel E: Self-Employment** | | | | | | | | |
| Men | 0.897** | 0.871** | 0.754** | 0.881** | 0.678* | 0.881** | 1.389*** | 0.800** |
| | (0.371) | (0.369) | (0.364) | (0.376) | (0.379) | (0.273) | (0.452) | (0.384) |
| Young Men | 0.766** | 0.768** | 0.685* | 0.744* | 0.526 | 0.763* | 1.127** | 0.645 |
| | (0.401) | (0.390) | (0.396) | (0.392) | (0.385) | (0.404) | (0.491) | (0.436) |
| Old Men | 1.018* | 0.916 | 0.733 | 0.976 | 0.826 | 0.964* | 1.809*** | 0.959 |
| | (0.593) | (0.599) | (0.547) | (0.642) | (0.583) | (0.583) | (0.699) | (0.588) |
| **Panel F: Inactivity** | | | | | | | | |
| Men | -0.582* | -0.533 | -0.549 | -0.533 | -0.490 | -0.571 | -0.814* | -0.511 |
| | (0.348) | (0.337) | (0.345) | (0.346) | (0.342) | (0.348) | (0.440) | (0.341) |
| Young Men | 0.405** | 0.469** | 0.494** | 0.482** | 0.432** | 0.417** | 0.274 | 0.412* |
| | (0.206) | (0.198) | (0.204) | (0.194) | (0.203) | (0.207) | (0.256) | (0.225) |
| Old Men | -2.298** | -2.276*** | -2.372*** | -2.327*** | -2.152** | -2.289*** | -2.673** | -2.152*** |
| | (0.895) | (0.870) | (0.905) | (0.886) | (0.922) | (0.888) | (1.079) | (0.827) |
| **Panel G: Retirement** | | | | | | | | |
| Men | -1.241*** | -1.205*** | -1.268*** | -1.198*** | -1.134*** | -1.243*** | -1.484*** | -1.128*** |
| | (0.348) | (0.345) | (0.333) | (0.367) | (0.362) | (0.346) | (0.417) | (0.311) |
| Young Men | -0.036 | -0.030 | -0.049 | -0.039 | -0.014 | -0.041 | -0.131 | 0.023 |
| | (0.121) | (0.120) | (0.111) | (0.126) | (0.124) | (0.121) | (0.167) | (0.115) |
| Old Men | -3.472*** | -3.389*** | -3.536*** | -3.386*** | -3.269*** | -3.469*** | -3.936*** | -3.303*** |
| | (0.856) | (0.846) | (0.845) | (0.884) | (0.914) | (0.849) | (0.993) | (0.782) |
| **Sample Size [F-statistics]** | | | | | | | | |
| Men | 83,627 | 83,627 | 83,627 | 83,627 | 83,418 | 82,953 | 83,627 | 83,627 |
| | [29.23] | [25.64] | [70.36] | [17.52] | [29.71] | [29.19] | [23.66] | [27.52] |
| Young Men | 56,472 | 56,472 | 56,472 | 56,472 | 56,337 | 55,897 | 56,472 | 56,472 |
| | [26.12] | [23.14] | [61.65] | [15.97] | [26.70] | [26.16] | [21.44] | [25.52] |
| Old Men | 27,155 | 27,155 | 27,155 | 27,155 | 27,081 | 27,056 | 27,155 | 27,155 |
| | [35.32] | [30.67] | [85.25] | [20.79] | [35.77] | [35.30] | [28.05] | [34.69] |

Standard errors clustered at industry level reported in parentheses. First-stage F statistics and sample size reported below. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$
Source is ONS Longitudinal Study.

## Table A.8: Robustness Checks. Women.

| | (1) Baseline estimates | (2) excluding Germany | (3) excluding Germany, US | (4) excluding EU countries | (5) adding ind controls | (6) adding occ controls | (7) accounting for Easter Europe | (8) accounting for exports |
|---|---|---|---|---|---|---|---|---|
| **Panel A: Manufacturing employment** | | | | | | | | |
| Women | -5.810** | -5.817** | -5.460** | -5.830** | -5.823*** | -5.823** | -5.943** | -5.748** |
| | (2.314) | (2.304) | (2.272) | (2.315) | (2.246) | (2.314) | (2.427) | (2.405) |
| Young Women | -6.268*** | -6.354*** | -5.778*** | -6.483*** | -6.319*** | -6.283*** | -6.591*** | -6.098** |
| | (2.276) | (2.277) | (2.213) | (2.340) | (2.215) | (2.275) | (2.328) | (2.391) |
| Old Women | -4.843* | -4.719* | -4.726* | -4.519* | -4.768* | -4.879* | -4.760 | -4.980* |
| | (2.726) | (2.707) | (2.683) | (2.670) | (2.640) | (2.728) | (2.905) | (2.780) |
| **Panel B: Unemployment** | | | | | | | | |
| Women | 0.057 | 0.080 | 0.065 | 0.110 | 0.056 | 0.048 | 0.034 | 0.071 |
| | (0.309) | (0.313) | (0.310) | (0.332) | (0.309) | (0.312) | (0.263) | (0.309) |
| Young Women | 0.317 | 0.345 | 0.352 | 0.365 | 0.331 | 0.315 | 0.318 | 0.333 |
| | (0.441) | (0.447) | (0.454) | (0.463) | (0.439) | (0.441) | (0.382) | (0.442) |
| Old Women | -0.425** | -0.409** | -0.469** | -0.376* | -0.475** | -0.453** | -0.457** | -0.415** |
| | (0.199) | (0.202) | (0.187) | (0.223) | (0.203) | (0.200) | (0.181) | (0.204) |
| **Panel C: In Work** | | | | | | | | |
| Women | -0.738 | -0.746 | -0.726 | -0.688 | -0.713 | -0.725 | -0.753 | -0.810 |
| | (0.577) | (0.590) | (0.575) | (0.629) | (0.566) | (0.575) | (0.559) | (0.567) |
| Young Women | -0.997* | -1.068* | -0.932* | -1.103* | -0.913* | -0.988* | -0.876* | -0.998* |
| | (0.541) | (0.551) | (0.508) | (0.613) | (0.509) | (0.541) | (0.458) | (0.538) |
| Old Women | -0.096 | 0.002 | -0.207 | 0.251 | -0.214 | -0.071 | -0.279 | -0.266 |
| | (1.075) | (1.094) | (1.076) | (1.119) | (1.081) | (1.062) | (1.041) | (1.059) |
| **Panel D: Employment** | | | | | | | | |
| Women | -0.117 | -0.137 | -0.111 | -0.073 | 0.011 | -0.097 | -0.358 | -0.114 |
| | (0.721) | (0.732) | (0.716) | (0.751) | (0.717) | (0.716) | (0.713) | (0.729) |
| Young Women | -0.312 | -0.395 | -0.214 | -0.460 | -0.099 | -0.301 | -0.425 | -0.171 |
| | (0.596) | (0.606) | (0.566) | (0.654) | (0.583) | (0.596) | (0.604) | (0.604) |
| Old Women | 0.430 | 0.517 | 0.239 | 0.834 | 0.370 | 0.470 | 0.051 | 0.247 |
| | (1.254) | (1.269) | (1.234) | (1.304) | (1.262) | (1.232) | (1.134) | (1.219) |
| **Panel E: Self-Employment** | | | | | | | | |
| Women | -0.620 | -0.608 | -0.615 | -0.615 | -0.724* | -0.627 | -0.395 | -0.696* |
| | (0.388) | (0.385) | (0.386) | (0.379) | (0.386) | (0.390) | (0.339) | (0.400) |
| Young Women | -0.685 | -0.672 | -0.718 | -0.642 | -0.813* | -0.687 | -0.451 | -0.827* |
| | (0.459) | (0.459) | (0.461) | (0.461) | (0.460) | (0.461) | (0.404) | (0.457) |
| Old Women | -0.526 | -0.514 | -0.447 | -0.583 | -0.583 | -0.542 | -0.330 | -0.513 |
| | (0.443) | (0.442) | (0.423) | (0.458) | (0.441) | (0.439) | (0.377) | (0.444) |
| **Panel F: Divorce** | | | | | | | | |
| Women | -0.502* | -0.475* | -0.526** | -0.463* | -0.516** | -0.513* | -0.565** | -0.541** |
| | (0.258) | (0.259) | (0.264) | (0.265) | (0.257) | (0.263) | (0.274) | (0.264) |
| Young Women | -1.051*** | -1.030*** | -1.024*** | -1.067*** | -1.093*** | -1.063*** | -1.252*** | -1.075*** |
| | (0.311) | (0.305) | (0.315) | (0.304) | (0.229) | (0.321) | (0.407) | (0.321) |
| Old Women | 0.474 | 0.512 | 0.347 | 0.635 | 0.549 | 0.457 | 0.569 | 0.414 |
| | (0.409) | (0.419) | (0.386) | (0.462) | (0.428) | (0.410) | (0.393) | (0.400) |
| **Panel G: New Partnering** | | | | | | | | |
| Women | -0.773** | -0.836*** | -0.818*** | -0.851** | -0.728** | -0.757** | -0.880*** | -0.664** |
| | (0.314) | (0.318) | (0.311) | (0.340) | (0.319) | (0.315) | (0.325) | (0.338) |
| Young Women | -1.201*** | -1.298*** | -1.207*** | -1.346*** | -1.130** | -1.185*** | -1.316*** | -1.045** |
| | (0.458) | (0.464) | (0.449) | (0.505) | (0.458) | (0.456) | (0.451) | (0.501) |
| Old Women | 0.013 | 0.009 | -0.066 | 0.043 | -0.013 | 0.027 | -0.075 | 0.043 |
| | (0.320) | (0.323) | (0.306) | (0.349) | (0.324) | (0.327) | (0.353) | (0.318) |
| **Sample Size [F-statistics]** | | | | | | | | |
| Women | 85,170 | 85,170 | 85,170 | 85,170 | 84,957 | 85,066 | 85,170 | 85,170 |
| | [35.25] | [29.96] | [60.57] | [19.25] | [35.57] | [35.34] | [39.73] | [34.82] |
| Young Women | 56,800 | 56,800 | 56,800 | 56,800 | 56,667 | 56,721 | 56,800 | 56,800 |
| | [31.42] | [26.99] | [62.82] | [16.71] | [31.68] | [31.47] | [35.20] | [31.01] |
| Old Women | 28,370 | 28,370 | 28,370 | 28,370 | 28,290 | 28,345 | 28,370 | 28,370 |
| | [40.95] | [33.64] | [52.77] | [25.01] | [41.29] | [41.19] | [45.99] | [40.55] |

Standard errors clustered at industry level reported in parentheses. First-stage F statistics and sample size reported below. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source is ONS Longitudinal Study.

## Table A.9: Partner Analysis. Robustness Checks.

| | (1) Δ partner in work | (2) Δ partner active | (3) Δ partner empl | (4) Δ partner self emp | (5) Δ partner unempl | (6) Sample Size [F-statistic] |
|---|---|---|---|---|---|---|
| **Panel A: Women** | | | | | | |
| (i) Partner is active in 2001. | 1.522*** | 1.275** | 0.074 | 1.448*** | -0.247 | 46,543 |
| | (0.459) | (0.506) | (0.726) | (0.470) | (0.354) | [34.29] |
| (ii) Partner characteristics added (age, occupation). | 1.552*** | 1.300** | 0.339 | 1.213*** | -0.252 | 49,769 |
| | (0.514) | (0.536) | (0.641) | (0.455) | (0.338) | [35.48] |
| (iii) Partner is not exposed to import competition. | 1.534*** | 1.201** | 0.752 | 0.781 | -0.332 | 37,221 |
| | (0.572) | (0.611) | (0.893) | (0.561) | (0.444) | [31.34] |
| (iv) Same partner in 2001 and 2011. | 1.653*** | 1.400*** | 0.403 | 1.250*** | -0.253 | 49,769 |
| | (0.498) | (0.526) | (0.654) | (0.436) | (0.337) | [35.48] |
| **Panel B: Young Women** | | | | | | |
| (i) Partner is active in 2001. | 1.264** | 0.822** | -0.364 | 1.628** | -0.443 | 29,347 |
| | (0.526) | (0.371) | (1.160) | (0.806) | (0.424) | [30.97] |
| (ii) Partner characteristics added (age, occupation). | 1.343** | 0.911*** | 0.010 | 1.333* | -0.432 | 30,290 |
| | (0.613) | (0.342) | (1.132) | (0.768) | (0.432) | [30.91] |
| (iii) Partner is not exposed to import competition. | 1.206* | 0.738 | 0.119 | 1.087 | -0.468 | 23,554 |
| | (0.646) | (0.558) | (1.354) | (0.993) | (0.465) | [25.93] |
| (iv) Same partner in 2001 and 2011. | 1.415** | 0.978*** | 0.048 | 1.367* | -0.437 | 30,290 |
| | (0.591) | (0.330) | (1.130) | (0.773) | (0.430) | [30.90] |
| **Panel C: Old Women** | | | | | | |
| (i) Partner is active in 2001. | 2.242** | 2.360** | 1.174 | 1.067 | 0.119 | 17,196 |
| | (0.896) | (1.146) | (1.035) | (0.881) | (0.757) | [39.01] |
| (ii) Partner characteristics added (age, occupation). | 2.120** | 2.169* | 1.197 | 0.924 | 0.048 | 19,479 |
| | (0.930) | (1.186) | (0.944) | (0.805) | (0.644) | [40.86] |
| (iii) Partner is not exposed to import competition. | 2.661** | 2.604* | 2.479** | 0.181 | -0.056 | 13,667 |
| | (1.221) | (1.460) | (1.195) | (0.819) | (0.931) | [39.70] |
| (iv) Same partner in 2001 and 2011. | 2.269** | 2.330* | 1.297 | 0.972 | 0.061 | 19,479 |
| | (0.933) | (1.224) | (0.943) | (0.810) | (0.646) | [40.86] |
| **Panel D: Men** | | | | | | |
| (i) Partner is active in 2001. | -1.074 | -0.752 | -0.753 | -0.320 | 0.322 | 40,429 |
| | (1.069) | (0.815) | (1.168) | (0.362) | (0.389) | [33.32] |
| (ii) Partner characteristics added (age, occupation). | -0.938 | -0.768 | -0.823 | -0.115 | 0.170 | 51,302 |
| | (0.670) | (0.498) | (0.702) | (0.310) | (0.321) | [30.99] |
| (iii) Partner is not exposed to import competition. | -0.587 | -0.401 | -0.159 | -0.427 | 0.186 | 36,515 |
| | (0.779) | (0.877) | (0.942) | (0.422) | (0.237) | [31.95] |
| (iv) Same partner in 2001 and 2011. | -0.911 | -0.732 | -0.809 | -0.102 | 0.179 | 51,302 |
| | (0.690) | (0.497) | (0.736) | (0.306) | (0.324) | [30.97] |
| **Panel E: Young Men** | | | | | | |
| (i) Partner is active in 2001. | -1.590** | -0.976** | -1.207 | -0.383 | 0.614 | 23,870 |
| | (0.693) | (0.383) | (0.947) | (0.550) | (0.510) | [29.68] |
| (ii) Partner characteristics added (age, occupation). | -0.700 | -0.281 | -0.472 | -0.229 | 0.419 | 30,277 |
| | (0.792) | (0.767) | (0.713) | (0.507) | (0.437) | [27.54] |
| (iii) Partner is not exposed to import competition. | -0.852 | -0.407 | -0.379 | -0.472 | 0.444 | 21,459 |
| | (0.526) | (0.463) | (0.682) | (0.651) | (0.326) | [28.28] |
| (iv) Same partner in 2001 and 2011. | -0.679 | -0.260 | -0.470 | -0.209 | 0.419 | 30,277 |
| | (0.769) | (0.742) | (0.708) | (0.501) | (0.437) | [27.52] |
| **Panel F: Old Men** | | | | | | |
| (i) Partner is active in 2001. | -0.264 | -0.442 | 0.091 | -0.356 | -0.178 | 16,559 |
| | (1.996) | (1.859) | (1.730) | (0.605) | (0.355) | [39.52] |
| (ii) Partner characteristics added (age, occupation). | -1.265 | -1.458 | -1.207 | -0.058 | -0.193 | 21,025 |
| | (1.264) | (1.194) | (1.043) | (0.575) | (0.283) | [36.57] |
| (iii) Partner is not exposed to import competition. | -0.210 | -0.434 | 0.274 | -0.484 | -0.224 | 15,056 |
| | (1.926) | (2.001) | (1.696) | (0.730) | (0.330) | [38.62] |
| (iv) Same partner in 2001 and 2011. | -1.337 | -1.514 | -1.274 | -0.062 | -0.178 | 21,025 |
| | (1.448) | (1.371) | (1.197) | (0.582) | (0.285) | [36.53] |

Standard errors clustered at industry level reported in parentheses. First-stage F statistics and sample size reported in the last column. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Source is ONS Longitudinal Study.

**Table A.10:** Placebo Exercise (1981-1991)

| | (1) Δ manuf | (2) Δ unempl | (3) Δ in work | (4) Δ active | (5) Δ divorced | (6) Δ fertility |
|---|---|---|---|---|---|---|
| Import Exposure | -0.875 | 0.041 | 0.115 | 0.106 | 0.131 | 0.354 |
| ALL | (0.577) | (0.120) | (0.215) | (0.179) | (0.080) | (0.226) |
| | [17.53] | [17.51] | [17.51] | [17.49] | [17.53] | [17.55] |
| | 178,082 | 176,985 | 176,985 | 178,066 | 178,082 | 175,476 |
| Import Exposure | -0.526 | -0.033 | 0.402 | 0.330* | -0.043 | 0.438 |
| MEN | (0.659) | (0.155) | (0.245) | (0.192) | (0.093) | (0.287) |
| | [24.12] | [23.92] | [23.92] | [24.00] | [24.12] | [24.29] |
| | 104,523 | 103,822 | 103,822 | 104,512 | 104,523 | 103,058 |
| Import Exposure | 0.176 | 0.153 | 0.216 | 0.294 | 0.372** | -0.205 |
| WOMEN | (0.449) | (0.126) | (0.292) | (0.297) | (0.186) | (0.389) |
| | [12.68] | [12.76] | [12.76] | [12.68] | [12.68] | [12.65] |
| | 73,559 | 73,163 | 73,163 | 73,554 | 73,559 | 72,418 |
| Import Exposure | -1.021 | 0.040 | 0.029 | 0.038 | -0.013 | 0.758** |
| YOUNG MEN | (0.854) | (0.169) | (0.234) | (0.126) | (0.130) | (0.366) |
| | [25.37] | [25.10] | [25.10] | [25.22] | [25.37] | [25.57] |
| | 72,241 | 71,853 | 71,853 | 72,231 | 72,241 | 71,078 |
| Import Exposure | 0.146 | -0.141 | 1.213** | 1.014* | -0.096 | -0.386 |
| OLD MEN | (0.637) | (0.257) | (0.549) | (0.592) | (0.118) | (0.376) |
| | [21.25] | [21.23] | [21.25] | [21.25] | [21.25] | [21.36] |
| | 32,282 | 31,969 | 31,969 | 32,281 | 32,282 | 31,980 |
| Import Exposure | -0.224 | 0.038 | 0.052 | 0.014 | 0.569* | -0.272 |
| YOUNG WOMEN | (0.522) | (0.142) | (0.352) | (0.323) | (0.297) | (0.482) |
| | [12.31] | [12.40] | [12.40] | [12.31] | [12.31] | [12.20] |
| | 50,021 | 49,766 | 49,766 | 50,016 | 50,021 | 49,087 |
| Import Exposure | 0.636 | 0.331** | 0.560 | 0.827 | 0.008 | 0.137 |
| OLD WOMEN | (0.581) | (0.148) | (0.487) | (0.538) | (0.159) | (0.392) |
| | [13.87] | [13.94] | [13.94] | [13.87] | [13.87] | [14.01] |
| | 23,538 | 23,397 | 23,397 | 23,538 | 23,538 | 23,331 |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Ind, Occ, TTWA FE | Yes | Yes | Yes | Yes | Yes | Yes |

Standard errors clustered at industry level reported in parentheses.
First-stage F statistics reported in square brackets. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$
Source is ONS Longitudinal Study.

**Table A.11:** Further Robustness Checks for Retirement (Men)

| | (1) Baseline | (2) Controlling for average retirement age in the 80s by industry | (3) Controlling for the share of retired people in the 80s by industry | (4) Controlling for decadal change (1981-1991) in retirement by industry |
|---|---|---|---|---|
| **Panel A: In Work** | | | | |
| Men | -0.219 | -0.202 | -0.271 | -0.453 |
| | (0.405) | (0.392) | (0.405) | (0.432) |
| Young Men | -1.275*** | -1.273*** | -1.229*** | -1.222*** |
| | (0.396) | (0.409) | (0.410) | (0.407) |
| Old Men | 1.581** | 1.643** | 1.348* | 0.638 |
| | (0.805) | (0.690) | (0.714) | 0.716) |
| **Panel B: Inactivity** | | | | |
| Men | -0.582* | -0.590** | -0.476* | -0.305 |
| | (0.348) | (0.292) | (0.284) | (0.278) |
| Young Men | 0.405** | 0.400* | 0.392* | 0.368* |
| | (0.206) | (0.208) | (0.213) | (0.222) |
| Old Men | -2.298** | -2.313*** | -1.970*** | -1.248** |
| | (0.895) | (0.696) | (0.722) | (0.627) |
| **Panel C: Retirement** | | | | |
| Men | -1.241*** | -1.221*** | -1.068*** | -0.854*** |
| | (0.248) | (0.250) | (0.275) | (0.288) |
| Young Men | -0.036 | -0.033 | -0.008 | -0.009 |
| | (0.121) | (0.093) | (0.094) | (0.107) |
| Old Men | -3.472*** | -3.430*** | -3.035*** | -2.223*** |
| | (0.856) | (0.658) | (0.745) | (0.778) |
| **Sample Size [F-statistic]** | | | | |
| Men | 83,627 | 77,157 | 77,173 | 77,173 |
| | [29.23] | [29.09] | [28.32] | [27.61] |
| Young Men | 56,472 | 52,385 | 52,393 | 52,393 |
| | [26.12] | [25.99] | [25.29] | [24.68] |
| Old Men | 27,155 | 24,772 | 24,780 | 24,780 |
| | [35.32] | [35.46] | [34.50] | [33.47] |

Standard errors clustered at industry level reported in parentheses.
First-stage F statistics and sample size reported below. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$
Source is ONS Longitudinal Study.