

DISCUSSION PAPER SERIES

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ABSTRACT

Household Responses to Trade Shocks*

We use large-scale panel data from linked decadal censuses in England and Wales to study the responses of both individuals and their partners to rising Chinese import competition in the 2000s. We test whether partners provide insurance against lost household earnings by increasing labour supply. We find that both own and partner responses to the shock vary significantly by gender. Men in households exposed to import competition respond by increasing labour force participation at older ages, and by moving into solo self-employment. This is true both in response to their own trade exposure, and as an 'added worker effect' when their partner is exposed to the shock. By contrast, we find no such response for women, who do not increase labour supply if their male partners were initially employed in exposed industries. In general, self-employment appears to act as an employment buffer for men but not women. The impacts of import competition on partnering and family dissolution also differ according to the gender of those affected: for women below 45, but not men, exposure to the trade shock reduces the likelihood of divorce and of living with a new partner. Overall, our findings underscore the importance of investigating household responses, and the self-employment margin, to fully understand the effects of trade shocks.

JEL Classification: D10, F14, F16, F61, J12

Keywords: import competition, families, labour supply, added-worker effects

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1 Introduction

A large literature has documented the labour market outcomes of workers exposed to trade shocks in many countries.¹ This literature has mainly focused on the direct implications for employment, earnings and sectoral reallocation of affected workers, typically finding persistent negative effects from increasing import competition. This raises the question of whether other forms of self-insurance are available to the workers affected by adverse trade shocks and their families, either through responses by the partner, or adjustments in labour force participation choices. Does self-employment provide a buffer for workers who lose their jobs? Do partners provide insurance by increasing labour supply, compensating for lost earnings? Do affected workers adjust the timing of their retirement?

In this paper, we investigate these adjustment mechanisms in response to increased import competition in the 2000s. Drawing on large-scale panel data which link individuals across decadal censuses in England and Wales, we study the effects of the rapid growth in Chinese manufacturing imports on individuals *and* their households. Our data allows us to observe changes in labour market status, including whether the worker is employed or self-employed, and, for those inactive in the labour market, the reason for inactivity. A further strength of the data is that it includes information on the labour market activity of co-residents, making it possible to study the degree to which households offer insurance against trade shocks.

Our empirical analysis compares own and partner outcomes for workers with similar characteristics, but who were initially employed in industries with different levels of exposure to import competition. We measure how workers' and their partners' outcomes changed from 2001 to 2011, following China's entry into the WTO in 2001. We instrument for the growth in import competition in each industry using the growth in Chinese exports to other developed economies, following [Autor et al. \(2013, 2014\)](#). Our main outcome variables are employment, self-employment and retirement; measures of family stability; and partner labour supply. We allow for heterogeneity in effects by gender and age, which we find to be quantitatively important.

We first document the direct effect of trade exposure on individuals' labour market outcomes. Workers initially employed in industries exposed to import competition are more likely to exit manufacturing, with the majority of them reallocating to non-manufacturing sectors. This confirms the findings of previous studies, which we discuss in detail below. Men and women, however, do not respond to trade shocks in the same way. For women, while we observe a decline in their manufacturing employment, we find no significant

¹See, among others, [Autor et al. \(2013, 2014\)](#); [Dauth et al. \(2014, 2021\)](#); [Balsvik et al. \(2015\)](#); [Utar \(2018\)](#); [Citino & Linarello \(2021\)](#); [De Lyon & Pessoa \(2021\)](#). See [Dorn & Levell \(2021\)](#) for a summary.

effects on their overall labour force participation or rates of self-employment in response to trade shocks. For men, in addition to a movement into non-manufacturing sectors and increased unemployment, we find a significant increase in self-employment, which mitigates their employment losses. Most of the increase in self-employment is accounted for by an increase in solo self-employment (i.e., own account workers without employees); this is especially true at older ages. We find a smaller, but still statistically significant, effect of import exposure on the proportion of men who become self-employed with employees. The effect on labour force participation differs by age: while young men initially employed in exposed industries are less likely to be active in the labour market 10 years later, old males in exposed industries are more likely to remain active due to reduced flows into retirement.

These findings suggest that male workers use self-employment and delayed retirement to offset the earnings effects of the shock. Both of these adjustment mechanisms to trade shocks have been so far relatively underexplored. While providing an alternative source of employment to displaced workers, self-employment, and in particular solo self-employment, is likely to be associated with economic insecurity for many former manufacturing employees (Boeri et al., 2020; Giupponi & Xu, 2020). The role of self-employment for displaced workers is perhaps analogous to the role played by the informal sector in developing countries, which has been found to similarly act as an employment ‘buffer’ against the effects of trade shocks (Dix-Carneiro et al., 2021). Our finding that trade-exposed male workers retire later is consistent with the increase in male self-employment, as self-employed workers tend to retire later than the employed (Crawford et al., 2021). Delayed retirement is also another way workers can compensate for any income losses that result from exposure to import competition. The fact we find no significant effects on retirement or rates of self-employment for women suggests that either the availability or use of these insurance mechanisms appears to differ by gender.

We next turn to the impact of trade shocks on family formation and dissolution. We find that for women below 45, exposure to import competition significantly reduces the likelihood of divorce or of living with a new partner. This could be because trade shocks, by reducing their future expected earnings, leave married women more financially reliant on their current partners. In contrast, we find no evidence that married men exposed to import competition are either more or less likely to get divorced. This latter finding contrasts with Autor et al. (2019), who find substantial effects of import competition in male-dominated industries on divorce and marriage rates in more exposed local labour markets in the US, and an accompanying increase in premature male mortality. It is however consistent with findings for other European countries (Keller & Utar, 2022; Giuntella et al., 2022). Our results suggest that the negative implications of family breakdown and other social impacts that studies of the US have identified following reductions in manu-

facturing employment (Che et al., 2018; Pierce & Schott, 2020) are not inevitable, and may depend on other aspects, such as labour market institutions, which differ across countries.

Our final set of results looks at the responses of partners of those affected by import competition. Here, we find no evidence that women are more likely to enter or stay in the labour force in response to shocks affecting their male partners (irrespective of whether young children are present in the household). Our finding of limited added worker effects among women partners is consistent with some other studies (Goux et al. (2014); Halla et al. (2020)). By contrast, we find that, in households where women are exposed to import competition, their male partners increase labour force participation. This effect is larger for older men, who see greater reductions in inactivity in response to shocks affecting their female partners. The literature on added worker effects has typically focused on female responses to shocks affecting the household (e.g. Lundberg (1985)), but our results show that male responses can be relevant too. We note that men respond to shocks affecting their partners in the same way that they respond to shocks affecting themselves - through reduced flows into inactivity at older ages and through greater self-employment.

We subject all of our results to several robustness checks and sensitivity analyses. Our main results already control for detailed socio-demographic characteristics of workers. We assess the sensitivity of our results to various alternative samples and specifications, and to controls for the impact of workers' exposure to increased export demand from China or to exposure to increased import competition from Eastern Europe during this period. Our findings are consistent across these alternative specifications. We also verify that our results do not reflect industry-specific trends that predate the rise of import competition from China using data from the 1980s and 90s.

Our work contributes to several broad strands of the literature. The first is the literature on the labour market effects of trade shocks. Earlier work has focused on the consequences of increased Chinese import competition at the local labour market (Autor et al., 2013; Dauth et al., 2014; Balsvik et al., 2015; Foliano & Riley, 2017), firm (Utar, 2014; Bloom et al., 2016; Autor et al., 2020), and individual level (Autor et al., 2014; Utar, 2018; Dauth et al., 2021; Citino & Linarello, 2021; De Lyon & Pessoa, 2021).² We contribute to this particular literature by additionally documenting workers' responses along the self-employment and retirement margins, and by studying responses of partners in the same household as exposed workers.³ This paper is also closely related to recent empirical studies on the impact of trade shocks on marriage and fertility. The literature

²A broader literature examines the effects of trade shocks based on other episodes, including the large import tariff reductions in emerging economies such as India and Brazil (see, among others, Topalova (2010); Dix-Carneiro & Kovak (2017, 2019); Gaddis & Pieters (2017)).

³Previous studies of the impacts of trade shocks have restricted their samples to those of working age only, and so have not explored the role of the retirement margin. For example, Autor et al. (2014) study a sample who are aged 22-64 over the whole period of analysis while Dauth et al. (2021) restrict their sample to individuals aged 22-54.

on household-level outcomes of import competition is much smaller than that studying employment and earnings, perhaps because the administrative datasets used to study the impacts of these shocks on individual workers often do not include information on other members of their household. [Autor et al. \(2019\)](#), as discussed above, study how Chinese import competition affects marriage, divorce and single parenthood rates across local labour markets in the US. [Keller & Utar \(2022\)](#) study the impacts of exposure to Chinese import competition on divorce rates and fertility in Denmark. Our finding on a reduction in divorce rates among women under 45 who were exposed to import competition is consistent with the ‘retreat to family’ phenomenon proposed in [Keller & Utar \(2022\)](#), although we do not find evidence of the same effects on childbirth they document in their paper. [Giuntella et al. \(2022\)](#) also find a negative and marginally significant effect of import competition on women’s divorce rates in Germany.

We also contribute to the more general empirical literature on added worker effects, which studies spousal labour supply responses to labour demand shocks affecting their partners. Prior work has found mixed results and tended to focus on employment responses for women ([Layard et al., 1980](#); [Heckman & Macurdy, 1980, 1982](#); [Lundberg, 1985](#); [Maloney, 1987, 1991](#); [Spletzer, 1997](#); [Cullen & Gruber, 2000](#); [Halla et al., 2020](#)). In a cross-country comparison, [Bredtmann et al. \(2018\)](#) show that the existence and the magnitude of added worker effects vary over the different welfare regimes within Europe. In contrast to these reduced-form estimates, studies estimating life cycle models tend to find that family labour supply is an important insurance mechanism to income shocks, allowing households to smooth consumption ([Stephens, 2002](#); [Attanasio et al., 2005](#); [Blundell et al., 2016](#)). We contribute to this literature by studying family labour supply responses in the context of a trade shock, which represents a large-scale structural change.⁴ Our results contain important lessons for other ongoing structural shifts, such as technological change.

A further contribution, is to the understanding of how economic shocks affect transitions into self-employment. [Hacamo & Kleiner \(2022\)](#) shows that college graduates who graduate in a recession are more likely to enter self-employment as ‘forced entrepreneurs’. [Babina \(2020\)](#) shows that firms’ financial distress induces employees to move into self-employment. Our paper documents that the industry-level shocks which we study in this paper induce similar movements into self-employment.

More generally, by providing evidence for the UK, this paper contributes to the understanding of patterns in the effects of trade shocks across countries. The UK is an interesting case for investigating the economic adjustment processes to trade shocks, given that it

⁴[Huber & Winkler \(2019\)](#) study correlations in exposure to trade shocks within couples. While their paper focuses on how differences within couples affect the impact of trade shocks on across-household inequality, they also find that own earnings decrease if partners are positively exposed to export shocks.

experienced the largest percentage decline in manufacturing employment among OECD countries between 1999 and 2007, at the same time as a large increase in its trade deficit with China (Dorn & Levell, 2021). Previous work has emphasised differences in labour market institutions and flexibility (Balsvik et al., 2015; Keller & Utar, 2022), and differences in trade patterns (Dauth et al., 2021; Giuntella et al., 2022) as potential explanations for the varying impact of Chinese import competition across countries.

The remainder of this paper proceeds as follows. Section 2 describes the ONS Longitudinal Study and other data sources we draw on. Section 3 sets out our empirical research design. We present the main results in Section 4: Section 4.1 shows how rising exposure to import competition affects the labour market status of individual workers. Section 4.2 considers the impacts on partnering and divorce. Section 4.3 looks at household labour supply responses. Section 5 concludes with a discussion of the implications of our findings. The Appendix presents supplemental results and robustness checks.

2 Data and Sample Description

2.1 The ONS Longitudinal Study Data

The main dataset we draw on is the Office for National Statistics (ONS) Longitudinal Study (LS) (Office for National Statistics, 2019). The LS contains linked census and life events data for a roughly 1% sample of the population of England and Wales (people born on one of four selected dates in a calendar year). It includes census records for over 500,000 people usually resident in England and Wales from the 1971, 1981, 1991, 2001, and 2011 censuses.⁵ The LS data includes core socio-demographic variables including the age, sex, marital status and locations of sampled individuals, as well as data on workers' employment, occupation, industry, hours worked and type of employment (whether they are employees, self-employed with employees, or solo self-employed).⁶ Although the census asks for detailed information about the nature of individuals' work, it does not include information about earnings. Life events data are linked for LS members, including births to sample mothers, deaths, and cancer registrations.

The LS has a number of advantages for our purposes. First, it is a panel, allowing us to track individuals across different censuses held every 10 years. Most of our analysis concerns the impact of import competition on outcomes between the years 2001 and 2011. We use data from 1981 and 1991 for placebo and robustness exercises. Second, the LS

⁵A 'usual resident' of the UK is anyone who, on census day, was in the UK and had stayed or intended to stay in the UK for a period of 12 months or more, or had a permanent UK address and was outside the UK and intended to be outside the UK for less than 12 months.

⁶Hours worked are reported in bands in the 2011 wave, allowing us to observe part-time and full-time status but not precise hours worked.

includes not only individuals who are employed, but also those who are self-employed or out of the labour force. Those out of the labour force also report the reason they are not working (e.g. because they are studying, retired, sick, at home, etc). Administrative data sources often do not include this information.⁷ Third, it includes the survey responses of co-residents of study members. This is essential, as it allows us to study family labour supply responses to shocks affecting an LS member. It also allows us to examine the correlation between exposure to trade shocks across spouses. Fourth, in contrast to many household-level surveys, participation in the census is a legal requirement and the ONS goes to considerable lengths to maximise its coverage ([Office for National Statistics, 2015a](#)). Both the 2001 and 2011 censuses have an estimated response rate of 94%. The LS also has low rates of attrition relative to other longitudinal datasets. 88% of LS members in the 2001 census were successfully matched to records in the 2011 census, after excluding those who were known to have died or emigrated ([Lynch et al., 2015](#)).

2.2 Other Data Sources

To construct measures of industries' exposure to import competition, we draw on trade flows from the United Nations Commodity Trade Statistics Database ([UN Comtrade](#)). This contains detailed statistics on trade in individual commodities. To obtain imports and exports by industry, we map the commodity codes from various years into the Classification of Product by Activity (CPA) codes, which are identical in their first four digits to 1992 UK Standard Industry Classification (SIC92) codes.⁸ We deflate values so that they are expressed in 2010 pounds.⁹

As we describe in more detail below, we measure each industry's import exposure as imports relative to total domestic sales. To calculate this, we need information on the turnover of different UK industries, which we compute using the Business Structure Database (BSD) ([Office for National Statistics, 2021](#)). The BSD is administrative data covering plant-level information on employment, turnover, geography, and main industry for almost all business organisations in the UK from 1997 until the present (only very

⁷For instance, the UK Annual Survey of Hours and Earnings (ASHE) used in [De Lyon & Pessoa \(2021\)](#) covers employees and thus cannot distinguish movements into self-employment from job loss, and unemployment from non-participation, and the administrative data used to study trade shocks in Germany ([Dauth et al., 2021](#)) does not cover the self-employed.

⁸Mappings from Harmonised System (HS) products codes to CPA industry codes are taken from the Eurostat Reference and Management of Nomenclatures (RAMON) Index of Correspondence Tables, accessible here: https://ec.europa.eu/eurostat/ramon/rerelations/index.cfm?TargetUrl=LST_REL.

⁹These data show a rapid and sustained increase in reported UK imports from China between 1999 and 2000. This most likely reflects a change in the treatment of imports from Hong Kong which originated in China in this year ([Baranga, 2018](#)). For this reason, we include imports from Hong Kong in our measures of Chinese imports for the UK, but not in our measures of Chinese imports to other countries (which we use as an instrument for UK imports), as they are not affected by this issue.

small businesses are not included in the register).¹⁰ We calculate industry turnover by summing turnover across individual plants in the BSD.

2.3 Sample Description

We track workers from 2001, the year China acceded to the World Trade Organization (WTO), and measure how outcomes change between 2001 and 2011. We focus on employees who were born between 1942 and 1983 and who were therefore aged between 18 and 59 in 2001. As a result, by 2011, some individuals in our sample are above the state pension age (which in 2011 was 65 for men and 60 for women). This allows us to study the extent to which individuals adjust the length of their working lives in response to a shock.

Prior work has shown that the effects and responses to economic shocks differ greatly by gender and age (Keller & Utar, 2022; Salvanes et al., 2022), we thus split our sample into subgroups on these dimensions. Our sample includes 83,627 male employees (with almost 24% working in manufacturing in 2001) and 85,170 women employees (9% of whom were working in manufacturing in 2001). Splitting the sample by age, we denote those aged 18-44 in 2001 as ‘young’, and those aged 45-59 as ‘old’.

Table 1 shows descriptives for our sample at baseline in 2001. Columns 1 and 4 (for men and women, respectively) include employees in all industries, columns 2 and 5 only include those employed in manufacturing industries, and columns 3 and 6 only include those employed in the top 20 industries most exposed to Chinese import competition (which are all in manufacturing, see Table A.1 for the full list). Because our regressions control for industry fixed effects, our empirical analysis effectively compares changes in outcomes for workers in more and less exposed manufacturing industries. Table 1 shows that workers in the most exposed manufacturing industries are broadly similar to other manufacturing workers in terms of their baseline characteristics, although there are some differences, as we now discuss.

Panel A presents some basic demographic characteristics on age and whether born abroad. The average age of workers is similar across all workers, manufacturing workers and those in the most highly exposed industries (38-39 years old). Workers in highly exposed industries were slightly more likely to be foreign born than other manufacturing workers. This is more true for women than for men: 12% of women in highly exposed industries are foreign born, compared to 9% of women in manufacturing as a whole, while the figures for men were 10% and 7% respectively. To account for these differences, we control for both age and foreign born status in our empirical analysis.

¹⁰The BSD is derived from the Inter-Departmental Business Register (IDBR), which is a live register of plant data collected by HM Revenue and Customs via VAT and Pay As You Earn (PAYE) records.

Table 1: Summary Statistics: Worker Characteristics in 2001.

	MEN			WOMEN		
	(1)	(2)	(3)	(4)	(5)	(6)
	All Industries	Manuf. Industries	High Exposed Industries	All Industries	Manuf. Industries	High Exposed Industries
Observations (with partners)	83,627 (57,415)	19,970 (14,651)	4,578 (3,258)	85,170 (58,084)	7,889 (5,510)	2,521 (1,797)
Panel A. Demographic Characteristics						
Age	38.44	39.53	38.91	38.61	38.60	39.34
Foreign-born	0.083	0.069	0.095	0.081	0.093	0.120
Panel B. Marriage and Family Characteristics						
Single	0.346	0.297	0.312	0.299	0.311	0.286
Married	0.581	0.625	0.610	0.583	0.574	0.604
Widowed	0.004	0.005	–	0.014	0.013	0.015
Divorced	0.068	0.073	0.075	0.104	0.102	0.095
Has Partner	0.687	0.729	0.713	0.683	0.699	0.714
Has Children	0.426	0.439	0.433	0.432	0.358	0.374
Has Young Children	0.157	0.157	0.171	0.126	0.116	0.110
Panel C. Labour Market Characteristics						
Part-time	0.062	0.019	0.029	0.409	0.212	0.200
Hours worked	42.19	42.37	41.95	31.56	35.59	35.84
Low-skill	0.243	0.144	0.144	0.605	0.404	0.340
Blue-collar	0.302	0.499	0.500	0.054	0.316	0.464
White-collar	0.455	0.356	0.355	0.341	0.279	0.196
Panel D. Partner Characteristics						
Partner age	39.70	40.18	39.46	43.21	42.88	43.54
Partner hours worked	21.51	20.77	20.61	38.88	38.77	38.11
Partner manufacturing	0.103	0.177	0.195	0.232	0.425	0.444
Partner active	0.786	0.790	0.770	0.929	0.929	0.925
Partner employed	0.730	0.741	0.716	0.764	0.784	0.780
Partner self-employed	0.039	0.032	0.033	0.147	0.127	0.126
Partner unemployed	0.017	0.017	0.020	0.018	0.018	0.019
Partner inactive home	0.151	0.146	0.167	0.007	–	–

Notes: The table shows mean values for employees in the 2001 Longitudinal Study. Columns 1 and 4 (for the sample of men and women, respectively) include employees in all industries, columns 2 and 5 includes only those employed in manufacturing industries, and columns 3 and 6 only include those employed in the top 20 three-digit SIC92 industries most exposed to Chinese import competition (see [Table A.1](#)). Cells marked “–” are cases where average values have been suppressed because they were calculated with fewer than 10 individuals. Source is ONS Longitudinal Study.

Panel B shows information on individuals' marital status and family situation. Men working in manufacturing industries are four percentage points more likely to have a partner and to be married than those working in non-manufacturing industries, highlighting the importance of studying partner responses and family dynamics in this context. However, both men and women in the most exposed manufacturing industries are similar in terms of their partnering, and in terms of whether they have children, to other manufacturing workers.

Panel C shows that general patterns of employment differ across men and women. 41% of female employees work part-time, while the fraction of male employees working part-time is just 6% (21% and 2% if employed in manufacturing). Consequently, men work on average longer hours than women (42 vs 32 hours per week). Men and women are also employed in different occupations, which we group into low-skill, blue-collar, and white-collar occupations.¹¹ Overall, 24% of men work in low-skill occupations, 46% work in white-collar occupations and 30% work in blue-collar occupations. By contrast, 61% of women work in low-skill occupations, 34% in white-collar occupations and only 5% in blue-collar occupations. A much larger proportion of workers of both sexes are employed in blue-collar occupations in highly-exposed industries (columns 3 and 6) and the fractions of workers in these occupations are more similar for men and women: 50% of men employed in trade-exposed industries are employed in blue-collar industries compared to 46% of women. However, men in highly trade-exposed industries are much more likely to work in white-collar roles (36% of men compared to 20% of women), while women in these industries are much more likely to work in low-skill occupations. The proportions of men in different occupations in highly-exposed industries are almost identical to the proportions for manufacturing as a whole. Women in highly-exposed occupations are however more likely to be in blue-collar occupations than women in other manufacturing industries. 46% of women in highly exposed industries are in blue-collar occupations, compared to 31% of women in manufacturing as a whole. We control for baseline occupation in our main empirical specification to account for these differences. We also show that our results are not sensitive to the inclusion of occupation controls in our robustness checks.

For LS members with partners, Panel D summarises partner characteristics. The average man's partner is 40 years old and works approximately 22 hours per week. 21% of men's partners are not active participants in the labour market.¹² Only 10% of men's

¹¹We 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".

¹²Of these, about 71% report being inactive because they are "looking after the home".

partners are employed in manufacturing (rising to 18% for the partners of men who are themselves employed in manufacturing). By contrast, the average partner of women is 43 years old and works 38 hours per week. Only 7% of them are inactive and 23% work in manufacturing (43% for partners of women who themselves work in manufacturing). Those in the most exposed industries are very similar in terms of their partner’s baseline characteristics to other manufacturing workers.

3 Empirical Approach

Our analysis exploits the rapid increase in Chinese exports surrounding China’s entry into the WTO in 2001. This increase has been attributed to a number of factors including a reduction in trade uncertainty (Handley & Limao, 2017), a reduction in the tariffs China itself charged on its imported inputs (Pierce & Schott, 2016; Amiti et al., 2020), the end of international import quotas under the multi-fibre agreement (Keller & Utar, 2022), as well as continued rapid Chinese productivity growth during this period.

Figure A.1 shows the increase in Chinese imports to the UK. Most of this increase occurred after 2001. Real imports from China increased from approximately £20 billion in 2001 to around £50 billion in 2011. This led to China doubling its share of UK imports from 5% to over 10%. The extent of that import competition varied substantially across industries. Appendix Table A.1 shows the 20 industries most affected by import competition between 2001-2011. Imports were concentrated in low-tech manufacturing such as textiles, furniture and machinery production (e.g., the manufacture of games and toys; luggage and handbags; footwear; leather), consistent with China’s strong comparative advantage in labour-intensive activities during this period (Amiti & Freund, 2010).

Our empirical strategy uses this cross-industry variation, following Autor et al. (2013, 2014). For a worker i initially employed in industry j ,¹³ exposure to import competition IE_j^{UK} is defined as the growth in imports from China during 2001-2011 relative to that industry’s total domestic sales (i.e., industry turnover plus UK imports minus UK exports):

$$IE_{j,2011-2001}^{UK} = \frac{\Delta Imports_{j,2011-2001}^{China \rightarrow UK}}{Turnover_{j,2001} + Imports_{j,2001} - Exports_{j,2001}} \quad (1)$$

We compare own and partner outcomes for workers with similar characteristics, but who were initially employed in industries with different levels of exposure to import competition. The baseline specification controls for age and gender, as well as fixed effects

¹³Workers’ initial industry is the 3-digit SIC92 code of their employer in 2001 (a total of 179 industries).

for initial occupation, local labour market and broad industry sector:

$$\Delta Y_{ij,t_1-t_0} = \alpha + \beta IE_{j,t_1-t_0}^{UK} + \delta X_{ij,t_0} + \gamma^{occ} + \gamma^{ind} + \gamma^{ttwa} + \epsilon_{ij,t_1-t_0} \quad (2)$$

where i is for individual, j is for industry, and $t_1 = 2011$ and $t_0 = 2001$. $\Delta Y_{ij,t_1-t_0}$ is the change in outcome Y between 2001-2011 for individual i who was employed in industry j in 2001. The coefficient β captures the effect of increased import competition. The vector X_{ij,t_0} contains baseline controls for workers' gender, five-year age groups and their interaction with gender, and foreign-born status. We include two-digit occupation (γ^{occ}) and one-digit industry fixed effects (γ^{ind}) to account for industry and occupation-specific trends (e.g., those related to the automation of routine tasks).¹⁴ We also include local labour market fixed effects (γ^{ttwa}), which are defined as 2001 Travel to Work Areas (TTWAs); geographical units analogous to Commuting Zones (CZ) in the US.¹⁵ In the household-level analysis, we additionally include partners' age, and occupation and industry fixed effects. We cluster standard errors at the level of three-digit industries, allowing for correlation in error terms among workers who are initially employed in the same narrow industry. We scale eq. (1) by the interquartile range of exposure across all manufacturing workers, such that the reported coefficients can be interpreted as the effect of moving a worker from the 25th to the 75th percentile in the exposure distribution among manufacturing workers. For individuals initially employed in manufacturing, the average increase in import exposure from China between 2001-2011 was 3.96 percentage points, and the interquartile range was 5.87 (Table A.4).¹⁶

The growth in import exposure could in part reflect domestic demand or productivity shocks, which we could confound with the role of growing import competition. To address this, we follow the standard approach in the literature and employ an instrumental variable (IV) strategy aimed at isolating the role of factors driving Chinese export growth that are specific to China. We thus instrument for import exposure in eq. (1) with

$$\widetilde{IE}_{j,2011-2001} = \frac{\Delta Imports_{j,2011-2001}^{China \rightarrow Other}}{Turnover_{j,1997} + Imports_{j,1997} - Exports_{j,1997}} \quad (3)$$

where the numerator is the change in imports from China from 2001 to 2011 to other

¹⁴We show in the robustness checks that the occupation controls turn out not to affect our results.

¹⁵There are 186 TTWAs. These are generated such that at least 75% of the area's resident workforce work in the area and at least 75% of the people who work in the area also live in the area. Individuals are assigned to TTWAs using a time-consistent definition of TTWAs across censuses from Montresor (2019).

¹⁶In the Appendix, we investigate the degree to which partners are differently affected by increased Chinese import competition. The exposure of partners in the same household tends to be low, at just 0.22 across all workers (Table A.5). This means that in most cases when an LS member is exposed to a large trade shock, their partner is employed in an unexposed industry.

non-UK high-income countries.¹⁷ Equation (3) uses turnover, import and export levels from 1997, the earliest year in which we observe industry turnover, to avoid the potential endogeneity of using 2001 imports and sales that may have already been influenced by Chinese import growth.¹⁸ The identifying assumption underlying the use of this instrument is that common patterns in Chinese trade across developed countries do not reflect correlated demand or technology shocks across high-income countries. While this cannot be ruled out completely, Autor et al. (2014) obtain very similar results when measuring the change in import exposure using residuals from a gravity model of trade flows, suggesting that correlated import demand shocks across high-income countries play little role.¹⁹

We run several checks to confirm that our results do indeed reflect the effects of increased import competition rather than other factors. To verify our results do not reflect industry-specific trends that predate the rise of import competition from China, we repeat our main regression specifications for the decades 1981-1991 and 1991-2001, using workers' *future* (2001-2011) exposure to growing Chinese import competition in Appendix B. We find no evidence that workers employed in 1981 in industries that would later be exposed to Chinese import competition saw greater exits from manufacturing or a higher unemployment rate in 1991. The effects of future import competition on unemployment and manufacturing employment are slightly greater when we measure them for the 1991-2001 period but they remain small and statistically insignificant at 5%. This is not unexpected as the rapid growth in Chinese imports to the UK began towards the end of this later period.

We also check whether the growth in immigration to the UK in the 2000s, particularly from Eastern Europe, could confound our results by examining the extent to which trade-exposed industries saw greater growth in the share of foreign-born workers. This appears not to be the case. We find that the correlation between import exposure and the growth in the share of foreign workers is essentially zero, which is true for all industries and specifically for manufacturing industries. We discuss further robustness checks in the next section.

¹⁷These countries are Australia, Canada, Denmark, France, Germany, Italy, Japan, Spain, Switzerland, and the United States. As we show in the Appendix, our results are robust to using different sets of countries to construct the instrument.

¹⁸In the Appendix, we regress the value in eq. (1) on the value in eq. (3), which is equivalent to the first-stage regression. The results in Table A.2 and Table A.3 show that import growth for different industries in these other countries is highly predictive of UK import growth from China.

¹⁹The gravity approach neutralises demand conditions in importing countries by using the change in China's exports relative to its exports within destination markets, helping isolate supply and trade cost-driven changes in China's export performance. See Autor et al. (2013, 2014) for further details.

4 Results

4.1 Individual Labour Responses to Import Competition

In this section, we report results on how rising exposure to Chinese import competition affects the labour market status of individual workers. [Table 2](#) shows regression results for different labour market outcomes: employment in manufacturing, unemployment, employment in any industry, self-employment and being active in the labour force (columns (1)-(5), respectively).²⁰ By construction, the coefficients in columns (2)-(4) sum to those in column (5). The regressions are estimated by two-stage least squares (2SLS), using the variable described in [eq. \(3\)](#) as an instrument for the change in import exposure given in [eq. \(1\)](#). All regressions include the full set of controls discussed in [Section 3](#). We also report the mean of the dependent variable for each outcome to benchmark the magnitudes of the effects relative to general trends.

Panel A shows the results for all workers in our sample. We return to the differences by gender and age groups below. Exposure to Chinese import competition significantly decreases the probability of being employed in manufacturing and increases the probability of unemployment. Increasing import exposure from the 25th percentile to the 75th percentile among manufacturing workers reduces the probability that a worker is employed in manufacturing in 2011 by 7.5 percentage points and increases the probability they are unemployed by 0.5 ppt (for comparison regarding the scale of this effect, the unemployment rate in 2011 was 7.4%, [Office for National Statistics \(2013\)](#)). While the effect on manufacturing employment is considerable, we do not detect a statistically significant effect on the probability of being in employment (column (3)). This implies that workers initially employed in industries exposed to import competition are more likely to exit manufacturing, with the majority reallocating to non-manufacturing sectors. The Appendix shows that workers initially employed in import-competing industries only found new employment in different, typically worse-paid, occupations. [Table A.6](#) presents results on how import competition affected the change in workers' employment in low-skill, blue-collar, and white-collar occupations. Trade-exposed workers are more likely to shift out of blue-collar occupations and move into lower-paid, low-skill occupations. These results are consistent with findings that workers exposed to the China shock experienced lower earnings growth, conditional on employment, as shown in the US ([Autor et al., 2014](#)), Denmark ([Utar, 2018](#)) and the UK ([De Lyon & Pessoa, 2021](#)).

Panels B and C of [Table 2](#) show how the effects of import competition differ by gender. Men and women in exposed industries respond quite differently. The negative impact of

²⁰To save space, we do not report employment in non-manufacturing as an additional outcome in the tables. Implicitly, as we discuss later, this could be inferred from columns (1) and (3).

import exposure on manufacturing employment is greater for men than women; with a one unit change in import exposure associated with a 7.4 ppt decline in male employment in manufacturing, compared to a 5.8 percentage point decline in female manufacturing employment. For men, there is also a significant increase in unemployment, alongside an increase in economic activity (column (5)), while for women the point estimates in columns (2) and (5), although not statistically significant, suggest that import exposure leads to economic inactivity rather than unemployment.

As we noted above, an advantage of our data is that we can follow transitions into self-employment, which cannot be observed in other administrative datasets that follow employees only. As the mean dependent variables in [Table 2](#) show, there was a general

Table 2: Import Exposure and Labour Market Responses by Gender

	(1)	(2)	(3)	(4)	(5)
	Δ manuf	Δ unempl	Δ empl	Δ self-empl	Δ active
Panel A. All					
Import Exposure	-7.483*** (2.243)	0.480** (0.235)	-0.736 (0.604)	0.296 (0.282)	0.039 (0.399)
Mean Dep. Var.	-7.60	2.65	-28.35	7.50	-18.19
First-Stage <i>F</i> -stat	[32.12]	[32.12]	[32.12]	[32.12]	[32.12]
Observations	168,797	168,797	168,797	168,797	168,797
Panel B. Men					
Import Exposure	-7.410*** (2.187)	0.802*** (0.274)	-1.116* (0.675)	0.897** (0.371)	0.583* (0.348)
Mean Dep. Var.	-10.14	3.24	-27.87	10.23	-14.39
First-Stage <i>F</i> -stat	[29.23]	[29.23]	[29.23]	[29.23]	[29.23]
Observations	83,627	83,627	83,627	83,627	83,627
Panel C. Women					
Import Exposure	-5.801** (2.314)	0.057 (0.309)	-0.117 (0.721)	-0.620 (0.388)	-0.681 (0.542)
Mean Dep. Var.	-5.12	2.07	-28.82	4.81	-21.92
First-Stage <i>F</i> -stat	[35.25]	[35.25]	[35.25]	[35.25]	[35.25]
Observations	85,170	85,170	85,170	85,170	85,170

Notes: Table shows the effect of import exposure on individual labour market outcomes. Dependent variables in columns 1-5 are: being employed in manufacturing, being unemployed, employed, self-employed and active in the labour market (unemployed or in-work). The regressions in all columns are estimated using two-stage least squares (2SLS), with the variable described in eq. (3) as an instrument for the change in import exposure given in eq. (1). Controls are the worker's gender, five-year age groups interacted with gender, and a dummy for whether the worker was foreign-born. We also include a 2-digit occupation, 1-digit industry, and local labour market (defined as 2001 Travel to Work Areas) fixed effects. See Section 3 for more details. Standard errors are clustered at the (SIC92) 3-digit industry level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

increase in self-employment over this period, particularly among men. The share of our sample who were self-employed increased by 10.2 percentage points among men and 4.8 ppt among women.²¹ Self-employment may have acted as an ‘employment buffer’ for male workers, allowing displaced workers to remain at work following the shock. While a one-unit increase in import exposure decreases the likelihood that men are employees in 2011 by 1.1 ppt, it increases the likelihood they are self-employed by 0.9 ppt. Our results indicate that for male workers, these transitions were an important means of insurance against job loss caused by import competition. By contrast, we do not find evidence of such a buffer effect for women, who are no more likely to move into self-employment if exposed to the trade shock.

Self-employment includes both solo self-employment (i.e., own account workers without employees) and self-employment with employees (those who run businesses and hire workers). This distinction and the transitions across these self-employment outcomes matter for the interpretation of the effects. In Appendix [Table A.7](#), we decompose self-employment into solo self-employment and self-employment with employees. Most (around two-thirds) of the self-employment effect for men is accounted for by an increase in solo self-employment. There is a smaller, but still statistically significant, effect of import exposure on the proportion of men who become self-employed with employees.

In [Table 3](#), we report results split by age (‘young’ workers aged 18-44 in 2001 and ‘old’ workers aged 45-59) and gender. The impact of import exposure on manufacturing employment is substantially stronger for young workers than for old, among both men and women: A one-unit change in the import exposure measure decreases the probability a worker is employed in manufacturing by almost 9 ppt for young men (6.3 ppt for young women) relative to 5 ppt for old men (4.8 ppt for old women).

[Table 3](#) also reveals substantial differences in the labour market responses of young and old men. While young male workers exposed to import competition are much less likely to be in work (increases in self-employment are not sufficient to compensate for decreases in employment), the opposite is true for old male workers, who are *more* likely to be in work and economically active if initially employed in an exposed industry. To understand what lies behind this effect, we decompose the effects of import exposure on economic inactivity according to different possible reasons: retirement, studying, looking after the home, sickness, and ‘other’ reasons. The results are reported in [Table A.8](#). The key reason for higher rates of economic activity is the reduced probability of retirement. A one unit increase in import exposure decreases the likelihood of retirement in 2011 by 3.5 percentage points. This is consistent with the large increase in self-employment

²¹Our results suggest that rising import competition contributed to this trend for men, although the size of this contribution is likely to have been small, as only a minority of workers were employed in trade-exposed industries.

Table 3: Import Exposure and Labour Market Responses by Gender and Age

	(1)	(2)	(3)	(4)	(5)
	Δ manuf	Δ unempl	Δ empl	Δ self-empl	Δ active
Panel A. Young Men					
Import Exposure	-8.946*** (2.520)	0.870** (0.357)	-2.041*** (0.686)	0.766** (0.401)	-0.405** (0.206)
Mean Dep. Var.	-7.64	3.45	-19.04	11.63	-3.96
First-Stage <i>F</i> -stat	[26.20]	[26.20]	[26.20]	[26.20]	[26.20]
Observations	56,472	56,472	56,472	56,472	56,472
Panel B. Old Men					
Import Exposure	-5.018** (2.087)	0.717** (0.313)	0.564 (0.972)	1.018* (0.593)	2.298** (0.895)
Mean Dep. Var.	-15.34	2.82	-46.23	7.32	-36.09
First-Stage <i>F</i> -stat	[35.32]	[35.32]	[35.32]	[35.32]	[35.32]
Observations	27,155	27,155	27,155	27,155	27,155
Panel C. Young Women					
Import Exposure	-6.268*** (2.276)	0.317 (0.441)	-0.312 (0.596)	-0.685 (0.459)	-0.679 (0.421)
Mean Dep. Var.	-4.68	2.47	-18.21	5.68	-10.05
First-Stage <i>F</i> -stat	[31.42]	[31.42]	[31.42]	[31.42]	[31.42]
Observations	56,800	56,800	56,800	56,800	56,800
Panel B. Old Women					
Import Exposure	-4.843* (2.726)	-0.425** (0.199)	0.430 (1.254)	-0.526 (0.443)	-0.521 (1.070)
Mean Dep. Var.	-5.99	1.28	-50.05	3.07	-45.69
First-Stage <i>F</i> -stat	[40.95]	[40.95]	[40.95]	[40.95]	[40.95]
Observations	28,370	28,370	28,370	28,370	28,370

Notes: Table shows the effect of import exposure on individual labour market outcomes. See notes of [Table 2](#) for a list of the controls and details on the IV. Standard errors clustered at the 3-digit industry level are reported in parentheses. The mean dependent variable and first-stage *F* statistics are reported below the estimates. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

shown in Panel B of [Table 3](#), as older self-employed workers are more likely to remain in paid work at any given age than permanent employees ([Crawford et al. \(2021\)](#); [Banks \(2016\)](#)).²² Another possible reason for delayed retirement is to compensate for reduced earnings following displacement, or a wealth effect on lifetime labour supply. The use of delayed retirement to compensate for lower retirement savings due to job loss has

²²Most (72%) of the effect on older men's self-employment is accounted for by an increase in solo self-employment ([Table A.7](#)). Younger men in exposed industries see a larger increase in self-employment with employees than older men.

been explored in life-cycle models including [Stock & Wise \(1990\)](#), [Scheiber \(1992\)](#) and [Mercurieva \(2019\)](#), but this phenomenon is relatively underexplored in the context of responses to trade competition. For women, we do not find a significant effect on self-employment or retirement.

In the Appendix, we report a range of robustness checks for these results. We summarise them in [Table C.1](#) and [Table C.2](#). First, we show that our results are robust to using different country combinations when constructing our instruments for import exposure in eq. (3). Second, we include a richer set of industry- and occupation-specific controls (R&D stock, capital intensity, the Routine Task Intensity (RTI)). These additional controls do not affect our main results. We also show that our results do not change if we exclude occupation fixed effects. Third, we assess the sensitivity of our results to another major contemporary trade shock, namely the accession to the European Union of a number of Eastern European countries in 2004.²³ Accounting for import competition with Eastern Europe does not alter our main findings, consistent with the fact that these countries specialised in quite different exports to China ([Foliano & Riley, 2017](#)). Finally, we examine whether our results are affected if we control for workers' exposure to rising export demand from China. Controlling for UK exports to China also leaves our main results unchanged.²⁴

4.2 Effects of Import Competition on Family Outcomes

We now turn to consider the impacts of import competition on partnering and divorce. Changes in family formation and family stability may be an important mechanism through which labour market shocks can affect broader social outcomes, including for subsequent generations. Recent work documents how trade shocks affect family outcomes, and the findings appear to differ by country. Focusing on individuals aged 18-39, [Autor et al. \(2019\)](#) show how US areas more exposed to Chinese import competition saw significantly lower marriage rates, lower fertility, and increased single-parenthood and child poverty. They link the declines in marriage rates to higher crime and greater mortality among men in affected areas. However, the effects differ according to whether shocks predominantly affected male or female workers in the local labour market. In labour markets where relatively more men were affected, marriage rates and fertility declined. In labour markets where relatively more women were affected, marriage rates and fertility increased. In line

²³Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia.

²⁴[Autor et al. \(2013\)](#) also find that incorporating changes in US exports to China had no effect on their estimates. By contrast, [Dauth et al. \(2014\)](#) find that, in Germany, exports to the 'East' (China and Eastern Europe) helped to offset the negative employment effects. All of this is consistent with the fact that both the US and the UK both saw large growth in their imports from China but only limited growth in their exports to China, while Germany saw large increases in both its imports from and exports to China, and so a much smaller deterioration in its bilateral trade balance ([Dorn & Levell \(2021\)](#)).

with this latter result, [Keller & Utar \(2022\)](#) find that female workers in Denmark who were exposed to Chinese competition in the apparel sector were more likely to have children, drop out of the labour force and get married than other comparable workers. The effects were greater for women in their late 30s, with fewer remaining fertile years. They argue their results are consistent with a reduction in the opportunity costs of raising a family for women. Unlike [Autor et al. \(2019\)](#), however, they did not find effects on marriage and fertility for men affected by the shock. In Germany, [Giuntella et al. \(2022\)](#) find that exposure to import competition from China and Eastern Europe in the 2000s led to lower fertility, while greater exposure to export opportunities to this region increased it. They also find a negative and marginally significant effect on divorce for women.

[Table 4](#) shows how import competition affected family status, split again by age and gender. Column (1) focuses on marriage. Different from [Autor et al. \(2019\)](#) but similar to [Keller & Utar \(2022\)](#), we do not find evidence for the effects on the marriage rates of young men who were initially unmarried, or on the divorce rates of young men who were initially married. Among old men, singles in exposed industries are by contrast significantly less likely to get married.

Turning to divorce, the results in column (2) imply that import competition leads to a reduction in the likelihood that trade-affected (married) women under 45 get divorced, which is consistent with [Keller & Utar \(2022\)](#) and [Giuntella et al. \(2022\)](#).²⁵ In particular, a one-unit increase in exposure to import competition decreases the likelihood of divorce by 2 percentage points. This response is greater in the presence of children in the household (not shown in [Table 4](#)), where the estimated coefficient increases to 2.64 (standard error 0.77). Similarly, we find that exposure to import competition means that married women under 45 are less likely to find and cohabit with a new partner (column (5)).

Columns (3) and (4) of [Table 4](#) show the effects of import competition on whether those initially in a couple, or those who were initially single, have a partner in the household in the subsequent wave (irrespective of whether they are married or not). The effects are small and not insignificant across all subgroups. This implies that, while the likelihood that young women in married couples exposed to import competition divorce their partners is lower than for other workers, the effect of import exposure on whether young women have a married or unmarried partner is not as great.

Unlike [Keller & Utar \(2022\)](#), we do not find significant effects of import exposure on fertility, measured as the count of children aged under 10 in the 2011 wave (not reported in [Table 4](#), the coefficient is 0.014 with standard error of 0.971), nor do we find significantly greater reductions in labour force participation among young women (column (5) in [Table 3](#)). This suggests the lower divorce rate among young women we observe is not

²⁵Note that in England and Wales overall in 2001, the median age of women at divorce is 37.7 years. The corresponding figure for males is 40.0 years ([Office for National Statistics, 2015b](#)).

Table 4: The Effects of Import Exposure on Divorce and Partnering

	(1) Δ married (if unmarried)	(2) Δ divorced (if married)	(3) Δ has part. (if couple)	(4) Δ has part. (if not couple)	(5) Δ new partner (if couple)
Panel A. Young Men					
Import Exposure	0.428 (1.122)	0.216 (0.693)	0.211 (0.436)	-0.351 (0.859)	0.651 (0.553)
First-Stage F -stat	[21.22]	[30.42]	[28.66]	[21.16]	[27.88]
Observations	29,854	26,648	34,636	21,866	30,699
Panel B. Old Men					
Import Exposure	-3.218*** (1.237)	0.754 (0.768)	-1.304 (0.878)	-2.639 (2.192)	-0.856 (0.618)
First-Stage F -stat	[47.76]	[33.06]	[36.84]	[28.64]	[36.62]
Observations	5,233	21,930	22,844	4,319	21,184
Panel C. Young Women					
Import Exposure	-0.083 (1.211)	-2.041*** (0.655)	0.553 (0.573)	1.358 (1.229)	-1.201*** (0.458)
First-Stage F -stat	[30.24]	[33.31]	[30.17]	[34.34]	[31.24]
Observations	28,716	28,126	36,004	20,838	30,698
Panel D. Old Women					
Import Exposure	1.906 (1.475)	-0.097 (0.461)	0.824 (0.680)	0.905 (1.429)	0.013 (0.320)
First-Stage F -stat	[38.69]	[41.65]	[40.05]	[44.05]	[40.46]
Observations	6,878	21,498	22,227	6,149	19,647

Notes: Table shows the effect of import exposure on individuals' family status. Column (1) shows the effects on marriage for a sample of initially unmarried people. Column (2) shows the effects on divorce for a sample of initially married individuals. Columns (3)-(4) show the effects on partnering for coupled and uncoupled individuals, respectively. Column (5) shows the effects on new partnering, that is, finding and cohabiting with a new person. We use age and other characteristics of the partner to assess whether partners of LS members observed in two different waves are likely to be the same individual or not. In this process, we lose a few observations, which is the reason why the number of observations between columns 3 and 5 differs. See notes of Table 2 for a list of the controls and details on the IV. Standard errors clustered at the 3-digit industry level are reported in parentheses. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$. Source is ONS Longitudinal Study.

driven by a fall in the opportunity costs of starting a family. A possible explanation for lower divorce rates among young women is that, by reducing their future expected earnings, exposure to import competition may leave women more financially reliant on their current partners.

4.3 Family Labour Supply Responses to Import Competition

In this section, we look at the responses of *partners* of those affected by import competition. We restrict attention to the sample of 'stable' couples, defined as households with

LS members who have a partner in both waves, and whose partners' characteristics – the year of birth and gender – do not change. For ease of exposition, we focus on heterosexual couples – including non-heterosexual couples in the analysis does not change our results.

The own and partner labour supply responses in response to import competition are shown for men in [Table 5](#) and for women in [Table 6](#). In these regressions, we include controls for partner characteristics (partner's age, occupation, and one-digit industry fixed effects), in addition to the previous controls used in [Section 4.1](#). The own-response effect sizes in these tables differ from those in [Table 2](#) and [Table 3](#) mainly because those in stable couples respond to the shock differently to singles. [Table A.9](#) shows these effects alongside those for singles. Men in couples who are exposed to import competition are just as likely to leave manufacturing as single men but are more likely to remain in work, less likely to be unemployed, and more likely to shift towards self-employment. Women in couples also behave differently to single women following the trade shock; the point estimates, although statistically insignificant, suggest that those in stable couples are more likely to leave the labour force and become inactive than single women (who are instead more likely to move into unemployment).

The final two columns of [tables 5 and 6](#) test for the presence or absence of added worker effects. In these tables, we focus on the extensive margin of responses (we discuss changes in hours of work below). [Table 5](#) shows that women in a relationship with men do not increase their labour market activity to compensate for any earnings losses their partner may have experienced as a result of rising import competition. Effects on the likelihood that female partners move into work are negative, small, and not significantly different from zero. This is true for both young and old women, despite the fact that their male partners are more likely to be unemployed in 2011 if in an exposed industry in 2001. In the Appendix, we also investigate heterogeneity in responses across subsamples, including whether children are present in the household or not, and whether partners were initially active in the labour market, employed full-time or employed part-time. The results do not change when we restrict the sample to those with children or young children, remaining negative and statistically insignificant ([Table A.12](#)).

A potential explanation for the absence of an added worker effect among women is that women's labour market responses are restricted by social norms that men should be the 'breadwinners' in the couple, particularly if increasing labour supply would make the woman the couple's main earner ([Bertrand et al., 2015](#)). Another possible explanation is that the UK unemployment benefit system, based on means-tested benefits over this period, creates disincentives for women to enter the labour market if their male partners lose their jobs ([Bredtmann et al., 2018](#)).

The results are different when it comes to the responses of men in households where women are exposed to rising import competition ([Table 6](#)). The male partners of women

Table 6: Import Exposure and Family Labour Supply Responses (WOMEN)

	OWN RESPONSE				PARTNER RESPONSE		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Δ manuf	Δ unempl	Δ empl	Δ self-empl	Δ active	Δ partner in work	Δ partner active	
Panel A. Women							
Import Exposure	-6.424*** (2.436)	-0.251 (0.237)	-0.212 (0.906)	-0.646* (0.359)	-1.108 (0.740)	1.249*** (0.403)	1.064*** (0.399)
Mean Dep. Var.	-5.21	1.46	-30.34	4.86	-24.02	-14.89	-14.42
First-Stage F-stat	[35.49]	[35.49]	[35.49]	[35.49]	[35.49]	[35.49]	[35.49]
Observations	49,767	49,767	49,767	49,767	49,767	49,767	49,767
Panel B. Young Women							
Import Exposure	-6.820*** (2.364)	0.091 (0.335)	-0.353 (0.810)	-0.711 (0.455)	-0.973 (0.606)	1.092** (0.506)	0.703** (0.329)
Mean Dep. Var.	-4.83	1.74	-17.53	6.02	-9.78	-3.26	-2.57
First-Stage F-stat	[30.91]	[30.91]	[30.91]	[30.91]	[30.91]	[30.91]	[30.91]
Observations	30,289	30,289	30,289	30,289	30,289	30,289	30,289
Panel C. Old Women							
Import Exposure	-5.720** (2.914)	-0.779*** (0.227)	0.103 (1.824)	-0.598 (0.513)	-1.273 (1.711)	1.627* (0.848)	1.802** (0.811)
Mean Dep. Var.	-5.79	1.03	-50.25	3.05	-46.17	-32.98	-32.85
First-Stage F-stat	[40.86]	[40.86]	[40.86]	[40.86]	[40.86]	[40.86]	[40.86]
Observations	19,478	19,478	19,478	19,478	19,478	19,478	19,478

Notes: Table shows the effects of import exposure on women's own labour supply and the labour supply of their male partners. Samples are for those in stable couples (those who remain in the same relationship over the period 2001-2011). In addition to the controls described in the notes of Table 2, all regressions control for partner characteristics: partners' age, occupation and one-digit industry fixed effects. Standard errors clustered at the 3-digit industry level are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

in trade-exposed industries increase their labour supply: each one-unit increase in import exposure raises the probability their partner is in work by 1.2 ppt. The effects are stronger for older women, for whom each one-unit increase in import exposure results in a 1.6 ppt increase in their partner's employment. The responses of men to import competition affecting their partners shown in [Table 6](#), mirror those we found for older men directly affected by import competition shown in [Table 3](#), showing an increase in labour market activity at older ages (when there is, of course, more scope to increase activity). Thus, increased activity at older ages by men appears to be a means of compensating for lost household earnings, whether they arise through shocks affecting men directly or through shocks affecting their partners.

Appendix [Table A.10](#) and [Table A.11](#) split the changes in the probabilities partners are in work into self-employment and employment, by gender. The increase in labour supply by the male partners is almost entirely driven by an increase in self-employment. Partners of older women exposed to trade shocks are also less likely to transition into part-time employment: each one-unit increase in women's import exposure increases the probability their partners remain in full-time work by 2.4 ppt. In other words, older men respond to shocks affecting their partners by increasing labour supply on both intensive and extensive margins.

The results on male partners' labour supply ([Table A.13](#)) show that male responses to shocks affecting their partners are greatest for families where the youngest child was aged 5-10. A natural question is whether the increase in male partners' activity is an increase in activity from men who were initially inactive, or a reduction in flows into inactivity from those who were initially active. We first note that about 93% of male partners are active in 2001 (see [Table 1](#)). We find that the effects of import exposure on male partner's labour supply are similar when we condition on households where male partners were initially active in the labour market or in (full-time) work in 2001 (see [Table A.13](#), Panels B.1, B.2, and B.4, respectively). This implies that much of the increase in labour force participation of men in households in which women are exposed to import competition is driven by the fact these men are less likely to move into inactivity by 2011. Male partners who were initially working full-time are also less likely to transition to part-time work when their partners are exposed to Chinese import competition.

A further question is whether our results are driven by the fact that partners are exposed to correlated shocks if, for example, partners work in the same industry. As we discussed in [Section 3](#), the cross-partner correlation in import exposure is low, suggesting this is unlikely to be driving our results. To further check this, we restrict our sample to cases where the partners of LS members are not employed in trade-exposed industries. The results are shown in [Table C.3](#) and [Table C.4](#) for women and [Table C.5](#) and [Table C.6](#) for men. The results are similar to those in our main sample, implying that cross-partner

correlations in import exposure are not driving our findings.

To summarise, our results suggest that household labour supply is a potentially important channel of insurance, especially in households where women are exposed to trade shocks: male partners of these women increase labour force participation through greater self-employment and reduced inactivity at older ages.

5 Conclusion

In this paper, we use linked census data to investigate the responses of households in England and Wales to increased Chinese import competition in the 2000s. In addition to studying the impact of this shock on individuals' employment in manufacturing and participation in the workforce, we study broader margins of adjustment at both the individual and the household level, including the shock's impact on self-employment, retirement, family formation and family stability, and family labour supply. Our analysis allows for heterogeneity by gender and age.

We have three key findings. First, we show that the decline in manufacturing that resulted from the trade shock not only led to an increase in unemployment, but also to an increase in self-employment among males, which acted as a buffer for affected workers. Most of this increase was accounted for by a greater likelihood of solo self-employment rather than self-employment with employees. This emphasises the importance for researchers of observing self-employment outcomes to understand worker adjustment mechanisms, especially in settings (such as the UK) where self-employment accounts for a substantial share of the workforce. We also observe that older males in exposed industries delay their retirement; this could either reflect more flexible retirement patterns associated with self-employment, or workers extending their working lives in response to earnings losses.

Second, we find that, in the UK, import competition significantly reduces the likelihood of divorce or of living with a new partner for women aged below 45. By reducing their future expected earnings, exposure to import competition may leave women more financially reliant on their current partners. In contrast, we find no evidence of an impact on the divorce rates of married men exposed to import competition. This is different from the US experience: [Autor et al. \(2019\)](#) find substantial increases in divorce and marriage rates in local labour markets where men were more exposed to the China trade shock. It is however consistent with findings from other European countries ([Giuntella et al., 2022](#); [Keller & Utar, 2022](#)). Our results suggest that the negative pattern of family breakdown and other social impacts following reductions in manufacturing employment (e.g., [Che et al. \(2018\)](#) on crime, [Pierce & Schott \(2020\)](#) on 'deaths of despair') need not be

inevitable. One possibility is that the scale and nature of these broader social impacts depend on whether affected individuals transition into inactivity (as appears to be the case for men in the US) or move into other forms of employment. Future research is needed to understand the importance of this particular channel.

Third, while we find no evidence that women respond to shocks affecting their male partners, we do find an added worker effect for men, who are significantly more likely to be working ten years later if their female partner was initially employed in a trade-exposed industry. The stronger responsiveness of males here mirrors our finding on gender differences regarding their own response to trade shock exposure. The effect is larger for older men, who see greater reductions in inactivity in response to shocks affecting their partners.

Overall, we show there is substantial heterogeneity in labour market and life decisions in response to increased import competition by gender, age, and family type. Men and women do not respond to trade shocks in the same way, nor do they respond in the same way to shocks affecting their partners. Future research should investigate to what extent these differences are driven by differences in opportunities or differences in constraints, such as social norms. More generally, heterogeneity in responses to labour market shocks is important for understanding how they will affect gender inequality.

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 findings on the partner responses suggest that the family plays an important part in providing insurance to workers; individuals without strong intra-household insurance are likely to be more in need of public insurance.

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APPENDIX FOR:

Household Responses to Trade Shocks

[Aitor Irastorza-Fadrique](#), [Peter Levell](#) & [Matthias Parey](#)

A Supplemental Results and Tables

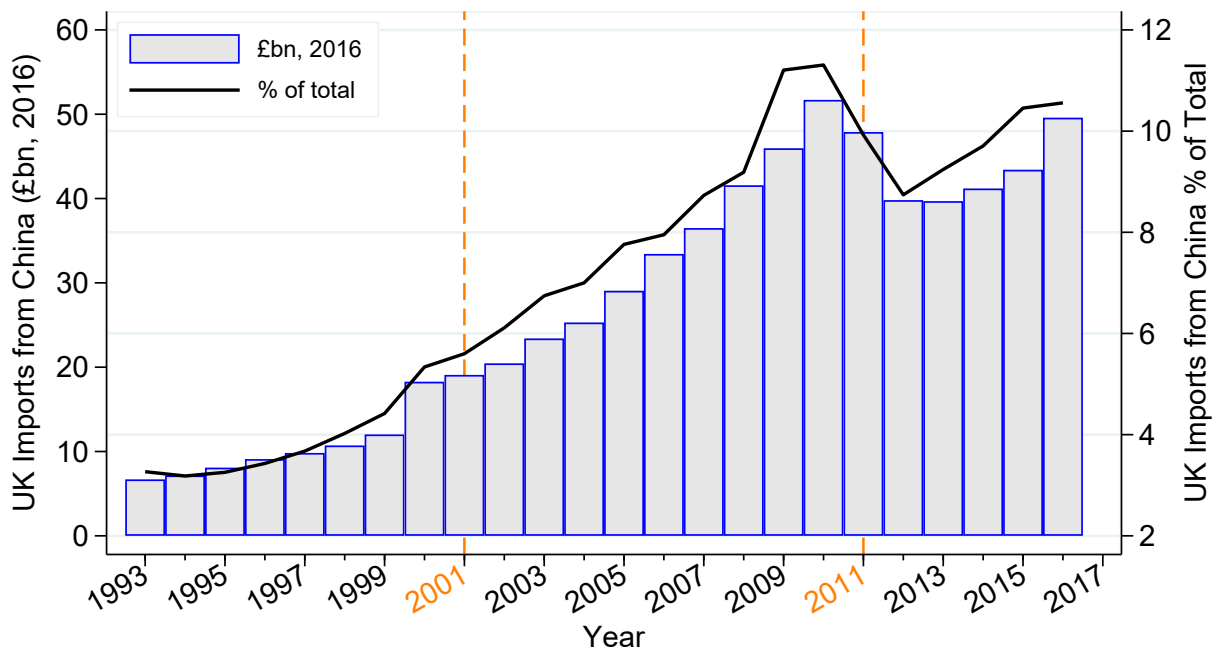
Table A.1: Top 20 Industries Most Exposed to Import Competition.

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

Notes: This table shows the 20 industries 3-digit SIC92 industries most affected by import competition between 2001-2011. See Section 3 for details about how import exposure is constructed. Source is ONS Longitudinal Study.

Figure A.1: Import Competition between the UK and China (1993-2016)

UK Imports from China (1993-2016)



Source is UN Comtrade Database

Table A.2: First-Stage Regressions (All Employees)

	(1) No Controls	(2) Individual Controls	(3) Partner Controls
Import Exposure IV	1.041*** (0.161)	1.034*** (0.182)	1.035*** (0.179)
R^2	0.744	0.769	0.772
Sample Size	168,797	168,797	115,523
Controls	No	Yes	Yes
Ind, Occ, TTWA FE	No	Yes	Yes
Partner FE	No	No	Yes

Notes: This table shows the first-stage results, where we regress exposure to import competition (see eq. (1)) on the instrument (see eq. (3)) for all employees. See notes of Table 2 and Table 5 for a list of the controls. Section 3 provides more details. Standard errors clustered at the industry level. *** $p < 0.01$. Source is ONS Longitudinal Study.

Table A.3: First-Stage Regressions (By Age and Gender)

	Panel A. Men			Panel B. Women		
Import Exposure IV	0.982*** (0.153)	0.973*** (0.180)	0.974*** (0.173)	1.141*** (0.176)	1.127*** (0.190)	1.132*** (0.193)
R^2	0.717	0.740	0.743	0.787	0.817	0.818
Sample Size	83,627	83,627	57,431	85,170	85,170	58,092
	Panel C. Young Men			Panel D. Young Women		
Import Exposure IV	0.989*** (0.159)	0.983*** (0.192)	0.985*** (0.184)	1.117*** (0.181)	1.111*** (0.198)	1.121*** (0.204)
R^2	0.722	0.742	0.747	0.779	0.809	0.808
Sample Size	56,472	56,472	34,605	56,800	56,800	35,951
	Panel E. Old Men			Panel F. Old Women		
Import Exposure IV	0.966*** (0.143)	0.952*** (0.160)	0.954*** (0.157)	1.188*** (0.168)	1.157*** (0.181)	1.148*** (0.181)
R^2	0.708	0.739	0.742	0.802	0.834	0.834
Sample Size	27,155	27,155	22,826	28,370	28,370	22,141
Controls	No	Yes	Yes	No	Yes	Yes
Ind, Occ, TTWA FE	No	Yes	Yes	No	Yes	Yes
Partner FE	No	No	Yes	No	No	Yes

Notes: This table shows the first-stage results, where we regress exposure to import competition (see eq. (1)) on the instrument (see eq. (3)). See Section 3 for more details. Standard errors clustered at the 3-digit industry level reported in parentheses. *** $p < 0.01$. Source is ONS Longitudinal Study.

Table A.4: Descriptive Overview. Import Exposure by Gender

	(1) All Workers	(2) Manufacturing Workers	(3) High Exposed Workers
Panel A. All			
Import Exposure	0.65	3.96	12.10
P90, P10 interval	[0.91, 0.00]	[12.77, 0.09]	[20.25, 6.13]
P75, P25 interval	[0.00, 0.00]	[6.12, 0.25]	[14.34, 6.31]
Observations	168,797	27,859	7,099
Panel B. Men			
Import Exposure	0.85	3.58	11.58
P90, P10 interval	[1.97, 0.00]	[10.74, 0.07]	[17.23, 6.13]
P75, P25 interval	[0.00, 0.00]	[5.57, 0.25]	[14.34, 6.31]
Observations	83,627	19,790	4,578
Panel C. Women			
Import Exposure	0.49	4.93	13.04
P90, P10 interval	[0.13, 0.00]	[14.34, 0.21]	[20.26, 6.14]
P75, P25 interval	[0.00, 0.00]	[6.31, 0.38]	[17.22, 9.00]
Observations	85,170	7,889	2,521

Notes: See Section 3 for details about how import exposure is constructed. Sources are ONS Longitudinal Study and UN Comtrade Database.

Table A.5: 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

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

Table A.6: Import Exposure and Labour Reallocation

	(1)	(2)	(3)
	Δ low-skill	Δ blue-collar	Δ white-collar
Panel A. All			
Import Exposure	1.465*** (0.444)	-2.056*** (0.633)	0.590 (0.789)
First-stage <i>F</i> -stat	[31.00]	[31.00]	[31.00]
Observations	133,605	133,605	133,605
Panel B. Men			
Import Exposure	1.172** (0.468)	-2.708*** (0.811)	1.536* (0.851)
First-stage <i>F</i> -stat	[28.21]	[28.21]	[28.21]
Observations	68,875	68,875	68,875
Panel C. Women			
Import Exposure	1.151* (0.611)	0.594 (0.531)	-1.745** (0.816)
First-Stage <i>F</i> -stat	[33.78]	[33.78]	[33.78]
Observations	64,730	64,730	64,730

Notes: Table shows the effects of import exposure on flows into different occupational groups conditional on remaining in employment. 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”. Standard errors clustered at the 3-digit industry level are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table A.7: Import Exposure and Types of Self-Employment (by Age and Gender)

	(1) SE	(2) Solo SE	(3) SE with employees	(1) SE	(2) Solo SE	(3) SE with employees
	Panel A. Men			Panel B. Women		
Import Exposure	0.897** (0.371)	0.577** (0.257)	0.320* (0.173)	-0.620 (0.388)	-0.679* (0.370)	0.059 (0.109)
First-stage <i>F</i> -stat	[29.23]	[29.23]	[29.23]	[35.25]	[35.25]	[35.25]
Sample Size	83,627	83,627	83,627	85,170	85,170	85,170
	Panel C. Young Men			Panel D. Young Women		
Import Exposure	0.766*** (0.401)	0.428 (0.301)	0.338* (0.182)	-0.685 (0.459)	-0.783* (0.418)	0.098 (0.176)
First-stage <i>F</i> -stat	[26.20]	[26.20]	[26.20]	[31.42]	[31.42]	[31.42]
Sample Size	56,472	56,472	56,472	56,800	56,800	56,800
	Panel E. Old Men			Panel F. Old Women		
Import Exposure	1.018* (0.593)	0.721* (0.435)	0.296 (0.319)	-0.526 (0.443)	-0.508 (0.393)	-0.017 (0.119)
First-stage <i>F</i> -stat	[35.32]	[35.32]	[35.32]	[40.95]	[40.95]	[40.95]
Sample Size	27,155	27,155	27,155	28,370	28,370	28,370

Notes: Table shows the effects of import exposure on whether or not individuals go into self-employment (SE), solo self-employment (solo SE) and self-employment with employees. See notes of Table 2 for a list of the controls and details on the IV. Panels (a) and (b) consider men and women, respectively. Panels (c)-(f) show results by different age and gender subsamples. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table A.8: Import Exposure and Economic (In)activity

	(1) Δ inactivity	(2) Δ retired	(3) Δ studying	(4) Δ at home	(5) Δ sickness	(6) Δ other
Panel A. Young Men						
Import Exposure	0.405** (0.206)	-0.036 (0.121)	-0.069 (0.073)	0.257** (0.112)	0.111 (0.167)	0.143 (0.102)
First-Stage <i>F</i> -stat	[26.20]	[26.20]	[26.20]	[26.20]	[26.20]	[26.20]
Observations	56,472	56,472	56,472	56,472	56,472	56,472
Panel B. Old Men						
Import Exposure	-2.298** (0.895)	-3.472*** (0.856)	-0.057 (0.041)	0.590** (0.234)	0.079 (0.356)	0.562** (0.226)
First-Stage <i>F</i> -stat	[35.32]	[35.32]	[35.32]	[35.32]	[35.32]	[35.32]
Observations	27,155	27,155	27,155	27,155	27,155	27,155
Panel C. Young Women						
Import Exposure	0.679 (0.421)	-0.059 (0.079)	0.085 (0.109)	0.319 (0.401)	-0.002 (0.205)	0.336 (0.221)
First-Stage <i>F</i> -stat	[31.42]	[31.42]	[31.42]	[31.42]	[31.42]	[31.42]
Observations	56,800	56,800	56,800	56,800	56,800	56,800
Panel D. Old Women						
Import Exposure	0.521 (1.070)	0.330 (0.831)	-0.127 (0.086)	0.447* (0.242)	-0.052 (0.277)	-0.075 (0.208)
First-Stage <i>F</i> -stat	[40.95]	[40.95]	[40.95]	[40.95]	[40.95]	[40.95]
Observations	28,370	28,370	28,370	28,370	28,370	28,370

Notes: Table reports the effect of import exposure on whether or not individuals are inactive in the labour force (column (1)). This is then decomposed into columns (2)-(6) based on the reason they are not participating: because they are retired (column (2)), studying (column (3)), looking after the home (column (4)), sick (column (5)), or for other reasons (column (6)). See notes of [Table 2](#) for a list of the controls and details on the IV. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table A.9: Import Exposure and Labour Market Responses by Family Type

	(1)	(2)	(3)	(4)	(5)
	Δ manuf	Δ unempl	Δ empl	Δ self-empl	Δ active
Panel A. Men in Stable Couples					
Import Exposure	-7.715*** (2.153)	0.580*** (0.236)	-0.697 (0.657)	1.298*** (0.395)	1.182*** (0.402)
Mean Dep. Var.	-11.20	2.18	-28.69	10.20	-16.31
First-Stage <i>F</i> -stat	[30.98]	[30.98]	[30.98]	[30.98]	[30.98]
Observations	51,302	51,302	51,302	51,302	51,302
Panel B. Single Men (in 2001 and 2011)					
Import Exposure	-7.837*** (2.263)	1.439** (0.702)	-1.842* (1.072)	0.769 (0.995)	0.336 (0.995)
Mean Dep. Var.	-8.03	5.60	-24.84	10.35	-8.892
First-Stage <i>F</i> -stat	[27.62]	[27.62]	[27.62]	[27.62]	[27.62]
Observations	17,578	17,578	17,578	17,578	17,578
Panel C. Women in Stable Couples					
Import Exposure	-6.424*** (2.436)	-0.251 (0.237)	-0.212 (0.906)	-0.646* (0.359)	-1.108 (0.740)
Mean Dep. Var.	-5.21	1.46	-30.34	4.86	-24.02
First-Stage <i>F</i> -stat	[35.49]	[35.49]	[35.49]	[35.49]	[35.49]
Observations	49,767	49,767	49,767	49,767	49,767
Panel B. Single Women (in 2001 and 2011)					
Import Exposure	-5.842** (2.199)	1.376* (0.785)	-0.164 (1.064)	0.063 (0.655)	1.275 (0.878)
Mean Dep. Var.	-5.23	3.53	-20.68	4.71	-12.44
First-Stage <i>F</i> -stat	[29.92]	[29.92]	[29.92]	[29.92]	[29.92]
Observations	14,639	14,639	14,639	14,639	14,639

Notes: Table shows effect of import exposure on individual labour market outcomes for men and women in stable couples (Panels A and C) and male and female singles (panels B and D). Stable couples refer to those who remain in the same relationship over the period 2001-2011. Single refers to those who never married and were without a partner in both 2001 and 2011. In addition to the controls described in the notes of [Table 2](#), the regressions for those in stable couples control for partner characteristics: partners' age, occupation, and one-digit industry fixed effects. Standard errors clustered at the 3-digit industry level are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table A.10: Import Exposure and Women's Labour Supply Responses by Age

	(1)	(2)	(3)	(4)	(5)
	Δ partner active	Δ partner in work	Δ partner employed	Δ partner self-empl	Δ partner full-time
Panel A. Partners of Men					
Import Exposure	-0.581 (0.433)	-0.764 (0.616)	-0.616 (0.731)	-0.149 (0.288)	-1.384 (0.851)
Mean Dep. Var.	-6.91	-7.01	-9.20	2.19	3.51
First-Stage <i>F</i> -stat	[30.98]	[30.98]	[30.98]	[30.98]	[34.34]
Observations	51,302	51,302	51,302	51,302	30,773
Panel B. Partners of Young Men					
Import Exposure	-0.457 (0.565)	-0.907 (0.553)	-0.613 (0.608)	-0.294 (0.479)	-0.683 (0.951)
Mean Dep. Var.	4.85	4.55	1.17	3.38	2.82
First-Stage <i>F</i> -stat	[27.53]	[27.53]	[27.53]	[27.53]	[30.17]
Observations	30,277	30,277	30,277	30,277	20,556
Panel C. Partners of Old Men					
Import Exposure	-1.018 (1.239)	-0.807 (1.336)	-0.777 (1.172)	-0.031 (0.561)	-3.012** (1.555)
Mean Dep. Var.	-23.83	-23.67	-24.13	0.47	4.88
First-Stage <i>F</i> -stat	[36.55]	[36.55]	[36.55]	[36.55]	[47.29]
Observations	21,025	21,025	21,025	21,025	10,217

Notes: Table shows the effects of import exposure on the labour supply of men's female partners. Panels A (partners of all men), B (partners of young men), and C (partners of old men) report results for different sub-samples. In addition to the controls described in the notes of [Table 2](#), all regressions control for partner characteristics: partners' age, occupation, and one-digit industry fixed effects. Standard errors clustered at the 3-digit industry level are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table A.11: Import Exposure and Men's Labour Supply Responses by Age

	(1)	(2)	(3)	(4)	(5)
	Δ partner active	Δ partner in work	Δ partner employed	Δ partner self-empl	Δ partner full-time
Panel A. Partners of Women					
Import Exposure	1.064*** (0.399)	1.249*** (0.403)	0.115 (0.576)	1.134*** (0.436)	1.227** (0.508)
Mean Dep. Var.	-14.42	-14.89	-16.86	1.96	6.99
First-Stage <i>F</i> -stat	[35.49]	[35.49]	[35.49]	[35.49]	[34.27]
Observations	49,767	49,767	49,767	49,767	37,018
Panel B. Partners of Young Women					
Import Exposure	0.703** (0.329)	1.092** (0.506)	-0.173 (1.095)	1.265** (0.572)	0.690 (0.448)
Mean Dep. Var.	-2.57	-3.26	-8.33	5.07	3.72
First-Stage <i>F</i> -stat	[30.91]	[30.91]	[30.91]	[30.91]	[31.73]
Observations	30,289	30,289	30,289	30,289	26,997
Panel C. Partners of Old Women					
Import Exposure	1.803** (0.811)	1.627* (0.848)	0.790 (1.090)	0.837 (0.785)	2.437** (1.178)
Mean Dep. Var.	-32.86	-32.98	-30.11	-2.86	15.84
First-Stage <i>F</i> -stat	[40.86]	[40.86]	[40.86]	[40.86]	[38.68]
Observations	19,478	19,478	19,478	19,478	10,021

Notes: Table shows the effects of import exposure on the labour supply of women's male partners. Panels A (partners of all women), B (partners of young women), and C (partners of old women) report results for different sub-samples. In addition to the controls described in the notes of Table 2, all regressions control for partner characteristics: partners' age, occupation, and one-digit industry fixed effects. Standard errors clustered at the 3-digit industry level are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table A.12: Import Exposure and Women's Labour Supply Responses.
By Presence of Children and Labour Market Status in 2001.

	(1) Δ partner active	(2) Δ partner in work	(3) Δ partner employed	(4) Δ partner self-empl	(5) Δ partner full-time	(6) Sample Size [F-S <i>F</i> -stat]
Panel A. Presence of Children in 2001						
(A.1) those with at least one child	-0.148 (0.514)	-0.596 (0.562)	-0.118 (0.641)	-0.478 (0.361)	-2.154 (1.365)	28,012 [33.57]
(A.1.1) youngest child aged 0-4	-0.484 (0.779)	-0.712 (0.701)	-0.180 (0.859)	-0.532 (0.533)	-2.932* (1.721)	11,178 [31.19]
(A.1.2) youngest child aged 5-10	-0.164 (1.613)	-0.336 (1.529)	1.437 (1.724)	-1.773* (0.930)	-1.485 (1.841)	7,142 [34.25]
(A.2) those without children	-1.097 (0.922)	-0.931 (1.056)	-1.076 (1.151)	0.145 (0.446)	0.123 (1.763)	23,290 [27.89]
Panel B. Partners' (Women) Labour Status in 2001						
(B.1) women active in 2001	-0.463 (0.739)	-0.925 (0.713)	-0.530 (0.844)	-0.396 (0.359)	-1.384 (0.851)	40,429 [33.33]
(B.2) women in work in 2001	-0.474 (0.761)	-0.787 (0.738)	-0.462 (0.880)	-0.325 (0.366)	-1.384 (0.851)	39,607 [32.26]
(B.3) women part-time in 2001	-0.809 (0.949)	-0.978 (0.872)	0.279 (1.090)	-1.257** (0.633)	-0.926 (1.345)	18,517 [35.39]
(B.4) women full-time in 2001	-0.324 (0.801)	-0.735 (0.842)	-1.039 (1.302)	0.304 (0.702)	-0.821 (1.142)	21,090 [29.24]

Notes: Table shows the effects of import exposure on the labour supply of men's female partners. In addition to the controls described in the notes of Table 2, all regressions control for partner characteristics: partners' age, occupation, and one-digit industry fixed effects. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table A.13: Import Exposure and Men's Labour Supply Responses.
By Presence of Children and Labour Market Status in 2001.

	(1) Δ partner active	(2) Δ partner in work	(3) Δ partner employed	(4) Δ partner self-empl	(5) Δ partner full-time	(6) Sample Size [F-S F-stat]
Panel A. Presence of Children in 2001						
(A.1) those with at least one child	1.314*** (0.462)	1.300* (0.725)	-0.105 (1.626)	1.405 (1.057)	1.404* (0.839)	23,699 [40.73]
(A.1.1) youngest child aged 0-4	0.841* (0.441)	1.285* (0.753)	1.417 (2.126)	-0.132 (1.742)	0.574 (1.176)	7,450 [43.12]
(A.1.2) youngest child aged 5-10	1.661** (0.781)	2.296** (0.996)	-1.549 (1.658)	3.846** (1.768)	1.871 (1.190)	6,371 [34.07]
(A.2) those without a dependent child	0.831 (0.516)	1.209** (0.477)	0.359 (0.953)	0.850 (0.902)	1.016* (0.544)	26,070 [29.94]
Panel B. Partners' (Men) Labour Status in 2001						
(B.1) men active in 2001	1.021*** (0.391)	1.358*** (0.394)	-0.023 (0.613)	1.381*** (0.489)	1.227** (0.508)	46,543 [34.30]
(B.2) men in work in 2001	0.913** (0.406)	1.257*** (0.372)	-0.068 (0.637)	1.325** (0.541)	1.227** (0.508)	45,723 [34.22]
(B.3) men part-time in 2001	-0.024 (1.973)	1.889 (2.101)	-6.353 (5.276)	8.242 (5.160)	5.865 (3.721)	2,117 [35.87]
(B.4) men full-time in 2001	0.919** (0.422)	1.201*** (0.357)	0.191 (0.706)	1.011 (0.615)	1.016** (0.457)	43,606 [33.54]

Notes: Table shows the effects of import exposure on the labour supply of women's male partners. In addition to the controls described in the notes of Table 2, all regressions control for partner characteristics: partners' age, occupation, and one-digit industry fixed effects. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

B Placebo Checks

Figure B.1: Placebo Exercise. Manufacturing Employment.

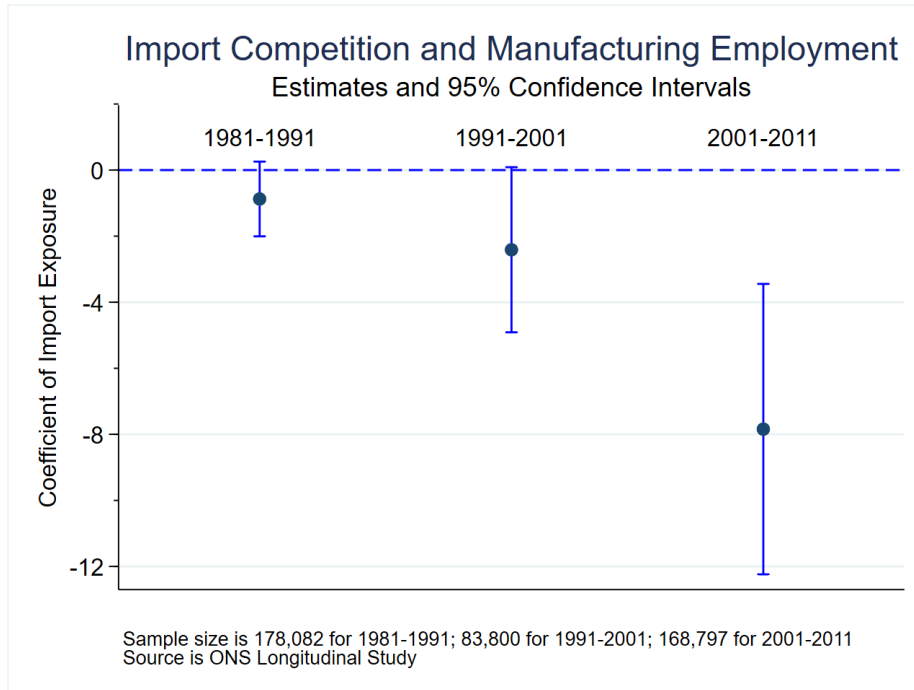


Figure B.2: Placebo Exercise. Unemployment.

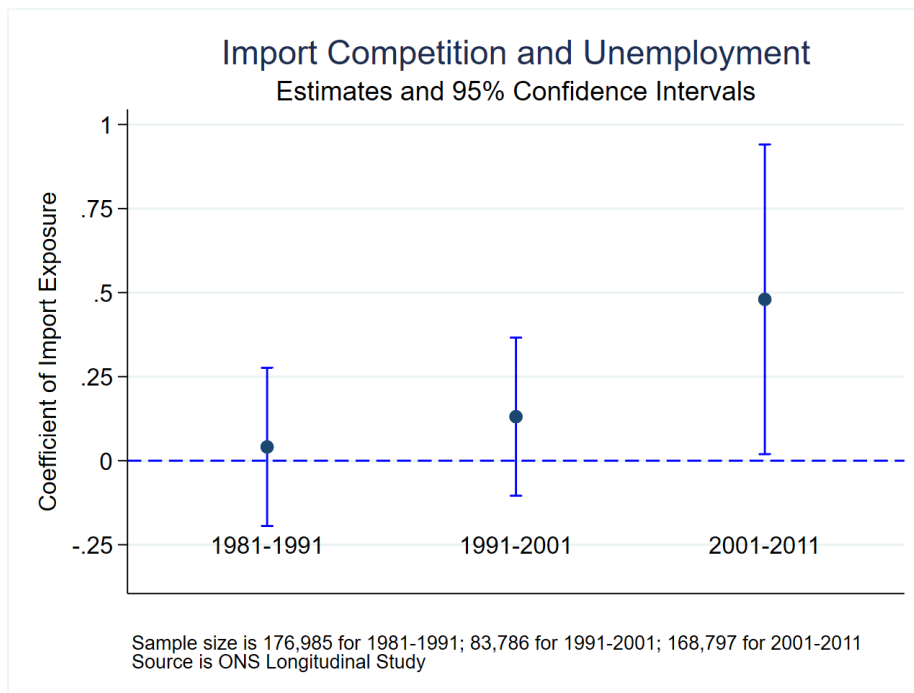


Table B.1: Placebo Exercise. 1981-1991.

	(1)	(2)	(3)	(4)
	Δ manuf	Δ unempl	Δ in work	Δ active
Panel A. All				
Import Exposure	-0.875 (0.577)	0.041 (0.120)	0.115 (0.215)	0.106 (0.179)
First-Stage <i>F</i> -stat	[17.53]	[17.51]	[17.51]	[17.49]
Observations	178,082	176,985	176,985	178,066
Panel B. Men				
Import Exposure	-0.526 (0.659)	-0.033 (0.155)	0.402 (0.245)	0.330* (0.192)
First-Stage <i>F</i> -stat	[24.12]	[23.92]	[23.92]	[24.00]
Observations	104,523	103,822	103,822	104,512
Panel C. Women				
Import Exposure	0.176 (0.449)	0.153 (0.126)	0.216 (0.292)	0.294 (0.297)
First-Stage <i>F</i> -stat	[12.68]	[12.76]	[12.76]	[12.68]
Observations	73,559	73,163	73,163	73,554

Notes: Table reports results of regressing changes in labour market outcomes between 1981-1991 in industries' future changes in import exposure (2001-2011). 'Being in work' cannot be decomposed between being in work as an employee and being self-employed in 1981. See notes of [Table 2](#) for a list of the controls and details on the IV. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$. Source is ONS Longitudinal Study.

Table B.2: Placebo Exercise. 1991-2001.

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ manuf	Δ unempl	Δ in work	Δ empl	Δ self-empl	Δ active
Panel A. All						
Import Exposure	-2.412*	0.131	-0.391	-0.452	0.060	-0.261
	(1.275)	(0.120)	(0.298)	(0.406)	(0.225)	(0.289)
First-Stage <i>F</i> -stat	[76.98]	[76.98]	[76.98]	[76.98]	[76.98]	[76.98]
Observations	83,786	83,786	83,786	83,786	83,786	83,786
Panel B. Men						
Import Exposure	-2.957*	0.027	-0.035	-0.616	0.580	-0.008
	(1.730)	(0.203)	(0.354)	(0.594)	(0.505)	(0.371)
First-Stage <i>F</i> -stat	[83.54]	[83.54]	[83.54]	[83.54]	[83.54]	[83.54]
Observations	50,484	50,484	50,484	50,484	50,484	50,484
Panel C. Women						
Import Exposure	-0.187	0.258	-0.598	-0.062	-0.536	-0.341
	(0.417)	(0.230)	(0.367)	(0.682)	(0.386)	(0.347)
First-Stage <i>F</i> -stat	[59.35]	[59.35]	[59.35]	[59.35]	[59.35]	[59.35]
Observations	33,302	33,302	33,302	33,302	33,302	33,302

Notes: Table reports results of regressing changes in labour market outcomes between 1991-2001 in industries' future changes in import exposure (2001-2011). See notes of [Table 2](#) for a list of the controls and details on the IV. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$. Source is ONS Longitudinal Study.

C Robustness Checks

Table C.1: Summary of Main Robustness Checks. MEN.

	Panel A. Manufacturing Employment.			Panel B. Unemployment.		
	Men	Young Men	Old Men	Men	Young Men	Old Men
A. Excluding EU countries	-7.587*** (2.223)	-9.264*** (2.605)	-5.024** (2.032)	0.830*** (0.288)	0.913** (0.383)	0.721** (0.313)
B. Adding industry controls	-7.495*** (2.149)	-9.132*** (2.525)	-4.919** (1.968)	0.816*** (0.281)	0.884** (0.366)	0.714** (0.324)
C. Adding occupation controls	-7.424*** (2.186)	-8.952*** (2.517)	-5.056** (2.086)	0.811*** (0.273)	0.885** (0.356)	0.717** (0.315)
D. No occupation fixed effects	-7.591*** (2.295)	-9.134*** (2.632)	-5.138** (2.184)	0.757*** (0.262)	0.892** (0.337)	0.681** (0.316)
E. Trade with Eastern Europe	-6.433** (2.575)	-8.272*** (2.804)	-3.524 (2.607)	0.738** (0.350)	0.804* (0.456)	0.627 (0.383)
F. Export Exposure	-7.269*** (2.271)	-8.645*** (2.591)	-5.065** (2.147)	0.769*** (0.261)	0.789** (0.347)	0.748** (0.339)
	Panel C. Employment.			Panel D. Self-Employment.		
	Men	Young Men	Old Men	Men	Young Men	Old Men
A. Excluding EU countries	-1.179* (0.697)	-2.138*** (0.670)	0.630 (1.064)	0.881** (0.376)	0.744* (0.392)	0.976 (0.642)
B. Adding industry controls	-1.004 (0.676)	-1.842*** (0.663)	0.612 (1.024)	0.678* (0.379)	0.526 (0.385)	0.826 (0.583)
C. Adding occupation controls	-1.121* (0.668)	-2.064*** (0.685)	0.607 (0.957)	0.881** (0.273)	0.763* (0.404)	0.964* (0.583)
D. No occupation fixed effects	-1.019 (0.717)	-1.820** (0.779)	0.407 (1.005)	0.902** (0.416)	0.698* (0.414)	1.205* (0.666)
E. Trade with Eastern Europe	-1.312 (0.851)	-2.206** (0.923)	0.237 (1.056)	1.389*** (0.452)	1.127** (0.491)	1.809*** (0.699)
F. Export Exposure	-1.059 (0.688)	-1.845*** (0.702)	0.444 (0.999)	0.800** (0.384)	0.645 (0.436)	0.959 (0.588)

Notes: Table summarises the robustness checks for our main results for men. Sample size is 83,627 for men; 56,472 for young men; and 27,155 for old men. See notes of [Table 2](#) for a list of the controls and details on the IV. A excludes European Union countries when constructing eq. (3). B and C consider a richer set of industry- and occupation-specific controls: R&D stock, capital intensity, and the Routine Task Intensity (RTI). D does not include occupation fixed effects. E accounts for import competition with Eastern Europe. F accounts for export exposure. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table C.2: Summary of Main Robustness Checks. WOMEN.

	Panel A. Manufacturing Employment.			Panel B. Unemployment.		
	Women	Young Women	Old Women	Women	Young Women	Old Women
A. Excluding EU countries	-5.830** (2.315)	-6.483*** (2.340)	-4.519* (2.670)	0.110 (0.332)	0.365 (0.463)	-0.376* (0.223)
B. Adding industry controls	-5.823*** (2.246)	-6.319*** (2.215)	-4.768* (2.640)	0.056 (0.309)	0.331 (0.439)	-0.475** (0.203)
C. Adding occupation controls	-5.823** (2.314)	-6.283*** (2.275)	-4.879* (2.728)	0.048 (0.312)	0.315 (0.441)	-0.453** (0.200)
D. No occupation fixed effects	-5.865** (2.545)	-6.262*** (2.395)	-5.013* (2.917)	0.106 (0.301)	0.384 (0.437)	-0.398** (0.197)
E. Trade with Eastern Europe	-5.943** (2.427)	-6.591*** (2.328)	-4.760 (2.905)	0.034 (0.263)	0.318 (0.382)	-0.457** (0.181)
F. Export Exposure	-5.748** (2.405)	-6.098** (2.391)	-4.980* (2.780)	0.071 (0.309)	0.333 (0.442)	-0.415** (0.204)
	Panel C. Employment.			Panel D. Self-Employment.		
	Women	Young Women	Old Women	Women	Young Women	Old Women
A. Excluding EU countries	-0.073 (0.751)	-0.460 (0.654)	0.834 (1.304)	-0.615 (0.379)	0.642 (0.461)	-0.583 (0.458)
B. Adding industry controls	0.011 (0.717)	-0.099 (0.583)	0.370 (1.262)	-0.724* (0.386)	-0.813* (0.460)	-0.583 (0.441)
C. Adding occupation controls	-0.097 (0.716)	-0.301 (0.596)	0.470 (1.232)	-0.627 (0.390)	-0.687 (0.461)	-0.542 (0.439)
D. No occupation fixed effects	-0.165 (0.747)	-0.296 (0.628)	0.132 (1.277)	-0.809* (0.435)	-0.886* (0.502)	-0.657 (0.488)
E. Trade with Eastern Europe	-0.358 (0.713)	-0.425 (0.604)	0.051 (1.134)	-0.395 (0.339)	-0.451 (0.404)	-0.330 (0.377)
F. Export Exposure	-0.114 (0.729)	-0.171 (0.604)	0.247 (1.219)	-0.696* (0.400)	-0.827* (0.457)	-0.513 (0.444)

Notes: Table summarises the robustness checks for our main results for women. See notes of [Table 2](#) for a list of the controls and details on the IV. Sample size is 85,170 for women; 56,800 for young women; and 28,370 for old women. See notes in [Table C.1](#) for details of different specifications. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table C.3: Robustness Sample. Partner Not Exposed to Import Competition. Import Exposure and Women’s Labour Supply Responses (I)

	(1)	(2)	(3)	(4)	(5)
	Δ partner active	Δ partner in work	Δ partner employed	Δ partner self-empl	Δ partner full-time
Panel A. Men					
Import Exposure	-0.009 (0.775)	-0.213 (0.689)	0.266 (0.838)	-0.478 (0.412)	-1.335 (0.817)
First-Stage <i>F</i> -stat	[31.99]	[31.99]	[31.99]	[31.99]	[33.53]
Observations	36,515	36,515	36,515	36,515	28,398
Panel B. Young Men					
Import Exposure	-0.240 (0.472)	-0.692 (0.516)	-0.137 (0.687)	-0.555 (0.648)	-1.049 (1.123)
First-Stage <i>F</i> -stat	[28.37]	[28.37]	[28.37]	[28.37]	[29.07]
Observations	21,459	21,459	21,459	21,459	18,942
Panel C. Old Men					
Import Exposure	0.135 (1.691)	0.353 (1.620)	0.805 (1.439)	-0.218 (0.330)	-2.018 (1.523)
First-Stage <i>F</i> -stat	[38.69]	[38.69]	[38.69]	[38.69]	[47.65]
Observations	15,056	15,056	15,056	15,056	9,456

Notes: Table shows the effects of import exposure on the labour supply of men’s female partners. Sample is those with partners that are working but in industries not exposed to import competition. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table C.4: Robustness Sample. Partner Not Exposed to Import Competition.
Import Exposure and Women's Labour Supply Responses (II)

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ partner active	Δ partner in work	Δ partner employed	Δ partner self-empl	Δ partner full-time	Sample Size [F-S F-stat]
Panel A. Presence of Children in 2001						
(A.1) those with at least one dependent child	-0.132 (0.598)	-0.382 (0.665)	0.657 (0.733)	-1.039 (0.583)	-2.025 (1.382)	18,985 [35.65]
(A.1.1) dependent child aged 0-4	-0.511 (0.795)	-1.324 (0.845)	0.368 (1.095)	-1.692* (0.922)	-3.063 (2.045)	6,270 [42.60]
(A.1.2) dependent child aged 5-10	0.482 (1.454)	0.970 (1.571)	3.272** (1.436)	-2.302 (1.445)	-0.530 (1.973)	5,205 [31.66]
(A.2) those without a dependent child	0.185 (1.395)	-0.019 (1.264)	-0.136 (1.477)	0.116 (0.522)	0.196 (1.765)	17,530 [28.65]
Panel B. Partners' Labour Status in 2001						
(B.1) partner in work in 2001	-0.009 (0.775)	-0.213 (0.689)	0.266 (0.838)	-0.478 (0.412)	-1.335 (0.817)	36,515 [31.99]
(B.2) partner part-time in 2001	-0.813 (0.953)	-0.926 (0.883)	0.556 (1.102)	-1.482** (0.673)	-0.875 (1.616)	17,657 [33.83]
(B.3) partner full-time in 2001	0.639 (0.904)	0.366 (0.821)	-0.048 (1.430)	0.413 (0.876)	-1.001 (1.111)	18,858 [29.29]

Notes: Table shows the effects of import exposure on the labour supply of men's female partners. Sample is those with partners that are working but in industries not exposed to import competition. In addition to the controls described in the notes of Table 2, all regressions control for partner characteristics: partners' age, occupation, and one-digit industry fixed effects. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table C.5: Robustness Sample. Partner Not Exposed to Import Competition.
Import Exposure and Men’s Labour Supply Responses (I)

	(1)	(2)	(3)	(4)	(5)
	Δ partner active	Δ partner in work	Δ partner employed	Δ partner self-empl	Δ partner full-time
Panel A. Women					
Import Exposure	0.943*** (0.456)	1.269*** (0.495)	0.468 (0.733)	0.802 (0.614)	1.340*** (0.399)
First-Stage <i>F</i> -stat	[31.38]	[31.38]	[31.38]	[31.38]	[31.50]
Observations	37,221	37,221	37,221	37,221	30,159
Panel B. Young Women					
Import Exposure	0.398 (0.488)	0.863 (0.549)	-0.191 (1.258)	1.054 (0.995)	1.000* (0.546)
First-Stage <i>F</i> -stat	[25.97]	[25.97]	[25.97]	[25.97]	[27.53]
Observations	23,554	23,554	23,554	23,554	22,018
Panel C. Old Women					
Import Exposure	2.441* (1.343)	2.476* (1.387)	2.162* (1.306)	0.314 (0.814)	2.216** (0.970)
First-Stage <i>F</i> -stat	[39.75]	[39.75]	[39.75]	[39.75]	[39.33]
Observations	13,667	13,667	13,667	13,667	8,141

Notes: Table shows the effects of import exposure on the labour supply of women’s male partners. Sample is those with partners that are working but in industries not exposed to import competition. In addition to the controls described in the notes of [Table 2](#), all regressions control for partner characteristics: partners’ age, occupation, and one-digit industry fixed effects. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.

Table C.6: Robustness Sample. Partner Not Exposed to Import Competition.
Import Exposure and Men's Labour Supply Responses (II)

	(1) Δ partner active	(2) Δ partner in work	(3) Δ partner employed	(4) Δ partner self-empl	(5) Δ partner full-time	(6) Sample Size [F-S F-stat]
Panel A. Presence of Children in 2001						
(A.1) those with at least one dependent child	1.577*** (0.461)	0.893 (0.929)	0.009 (1.993)	0.884 (1.433)	1.610* (0.961)	18,194 [42.12]
(A.1.1) dependent child aged 0-4	1.312** (0.528)	1.621** (0.704)	2.523 (2.329)	-0.902 (2.103)	1.496 (1.553)	5,807 [41.40]
(A.1.2) dependent child aged 5-10	2.631*** (0.982)	2.603* (1.362)	-1.373 (2.841)	3.975 (2.722)	0.687 (2.648)	4,868 [37.97]
(A.2) those without a dependent child	0.492 (0.734)	1.594** (0.694)	1.010 (1.136)	0.584 (1.058)	1.149 (0.702)	19,027 [24.29]
Panel B. Partners' Labour Status in 2001						
(B.1) partner in work in 2001	0.943** (0.456)	1.269** (0.495)	0.468 (0.733)	0.802 (0.614)	1.340** (0.399)	37,221 [31.38]
(B.2) partner part-time in 2001	-1.437 (2.630)	1.677 (3.012)	0.113 (6.436)	1.565 (5.768)	13.84** (6.943)	1,882 [39.71]
(B.3) partner full-time in 2001	0.930** (0.456)	1.165** (0.462)	0.446 (0.713)	0.719 (0.680)	1.119*** (0.410)	35,339 [31.17]

Notes: Table shows the effects of import exposure on the labour supply of women's male partners. Sample is those with partners that are working but in industries not exposed to import competition. In addition to the controls described in the notes of [Table 2](#), all regressions control for partner characteristics: partners' age, occupation, and one-digit industry fixed effects. Standard errors clustered at the 3-digit industry level reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source is ONS Longitudinal Study.