Globalization and Mental Distress*

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Abstract

We study the effects of import competition on workers' mental distress, using unique longitudinal data on mental health for British residents, coupled with measures of import competition in more than 100 industries over 1995-2007. We find that import competition has a large negative impact on individual mental health. Compared to a worker employed in the industry at the 25th percentile of the import competition distribution, a worker employed in the industry at the 75th percentile would need a yearly monetary compensation of £270 to make up for her greater utility loss. We find import competition to have larger effects on the right tail of the mental distress distribution, thereby increasing inequality in mental health not only across but also within industries. We show that this is consistent with import competition disproportionately hitting specific groups of workers in an industry, such as the youngest or those with a large family, a poor financial condition, a short job tenure, a temporary contract, and a blue-collar or tradable job. Using information on family ties, we find that import competition has negative spillovers to other family members. In particular, women's mental distress increases as a consequence of the import competition faced by their partners. Moreover, paternal import competition leads to reduced investment in child rearing and worsened children's self-esteem and life satisfaction. Finally, we provide evidence that import competition is likely to work through a complex set of channels. These include observable labor market outcomes such as higher likelihood of job displacement and lower wage growth, but also reduced job satisfaction and gloomier expectations about the future.

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1. Introduction

Globalization and trade integration can bring about significant improvements in countries' welfare (see, e.g., Costinot and Rodríguez-Clare, 2018, and Feenstra, 2018, for a recent discussion). As a case in point, the two decades preceding the Great Recession—and the associated trade collapse—have seen a rapid expansion in trade participation for many developed countries, coupled with substantial improvements in their living standards. Yet, the same period has witnessed an unprecedented diffusion of anti-globalization sentiments, which have rapidly pervaded several industrialized economies, fueling the affirmation of nationalist parties and putting trade integration under fire.[1] The magnitude of this phenomenon, its pervasiveness in society, and the fact that it has emerged during a phase of sustained economic expansion, suggest that trade integration may have produced distributional effects that go beyond the standard adjustments in earnings and employment faced by specific groups of workers after a trade shock. In this paper, we shed light on this issue by documenting the widespread effects of import competition on workers' mental distress.

A rapidly developing literature highlights a number of novel non-pecuniary effects of import competition, including increases in local area crime (Che and Xu, 2016; Dix-Carneiro et al., 2018; Deiana, 2018), household debt (Barrot et al., 2017), and job-related injuries (McManus and Schaur, 2016), as well as reductions in the provision of local public goods (Feler and Senses, 2017), and in marriage and fertility (Autor et al., 2019; Keller and Utar, 2018). A few independent studies, contemporaneous to our work, focus on import competition at the county level in the US and report that more trade exposed localities also experience a relative worsening in the average health conditions of their resident population.[2] Interestingly, among the various health indicators analyzed in these studies, trade exposed localities also exhibit higher mortality rates due to suicides and drug overdoses (Adda and Fawaz, 2017; Pierce and Schott, 2019); more hospital admissions due to alcohol abuse (Adda and Fawaz, 2017); and a higher average number of days of poor mental health in the population, as computed from answers to cross-sectional telephone surveys about self-assessed health (Adda and Fawaz, 2017; Lang et al., 2019). An interpretation of this evidence is that the exposure to rising import competition could lead to a deterioration in the mental health of individual workers over time. So far, however, there is no systematic evidence on this effect, as the emerging literature on import competition and health is based either on aggregate data at the local level or on cross-sectional surveys.

In this paper, we draw on extremely detailed, longitudinal, data on UK residents (sourced from the British Household Panel Survey, henceforth BHPS) to provide the first comprehensive analysis of how import competition affects the mental health of individual workers over time. We make four main contributions. First, the possibility to observe a clinically valid measure of mental distress for each person over many years enables us to identify the individual-level responses of mental distress to trade exposure, and to provide a precise quantification of the economic magnitude of the effects. Second, the rich information on demographic, occupational, and job characteristics contained in our data allows us to explore the implications of import competition for different groups of workers, providing the first

[1] For instance, statistics from the Eurobarometer show that the share of EU residents declaring to be in favor of globalization has dropped from 63 to 42% between 2003 and 2006, while the share of people declaring to be against globalization has soared from 29 to 44%. The evidence is similar across countries. In the UK, the country that we focus on in this paper, the share of people in favor (against) globalization has changed from 60% (27%) in 2003 to 47% (34%) in 2006. See, in particular, Autor, Dorn, Hanson and Majlesi (2016), Che et al. (2016), and Colantone and Stanig (2018*a*,*b*) on how trade has shaped the recent changes in political attitudes, influencing the emergence of nationalist and anti-establishment parties in developed countries.

[2] In this paper, we follow the convention and use the terms import competition and trade exposure interchangeably. See Colantone et al. (2015) for the first version of this paper.

assessment of how trade exposure shapes the entire distribution of subjective wellbeing across exposed workers. Third, the possibility to link each individual to the other members of her family allows us to study how the effects of import competition propagate to a worker's spouse and children, providing the first evidence of intra-household spillovers. Finally, we are able to shed light on a number of individual-level channels through which import competition may work. Some of these channels may involve a broad population of workers, including those whose observable labor market conditions do not change after the trade shock.

Our main measure of mental distress is the Generalized Health Questionnaire indicator (GHQ-12), an index that is widely used by clinicians for detecting psychiatric illness and extensively employed in academic research on mental health.[3] Using the information on each worker's industry of employment contained in the BHPS, we match the individual-level data on GHQ-12 with import data for 119 industries covering the entire UK economy. The period of analysis starts in 1995 and ends in 2007, the year before the onset of the Great Recession.[4]

Over the period of analysis, the UK has experienced a marked increase both in the incidence of mental distress and in import competition. The number of people suffering from mental health problems has reached 8 million in 2007, and the number of individuals using public mental health services has risen by 20% between 2003 and 2007.[5] At the same time, trade integration has proceeded rapidly, entailing a sharp increase in imports. Between 1995 and 2007, a period of rapid economic expansion characterized by a 34% growth in real per-capita GDP and a drop in unemployment from 8.7 to 5.3%, the share of total imports in UK GDP has risen by 10% (from 24.8 to 27.3%), while the share of exports has stagnated at around 25% (World Development Indicators). Figure 1 suggests that import competition and the rise of mental distress over this period could be related to each other. The figure reports raw data on GHQ-12 and imports (normalized by turnover) for all available years, showing that both variables have trended upward in the long run, and have followed a close evolution also from year to year.

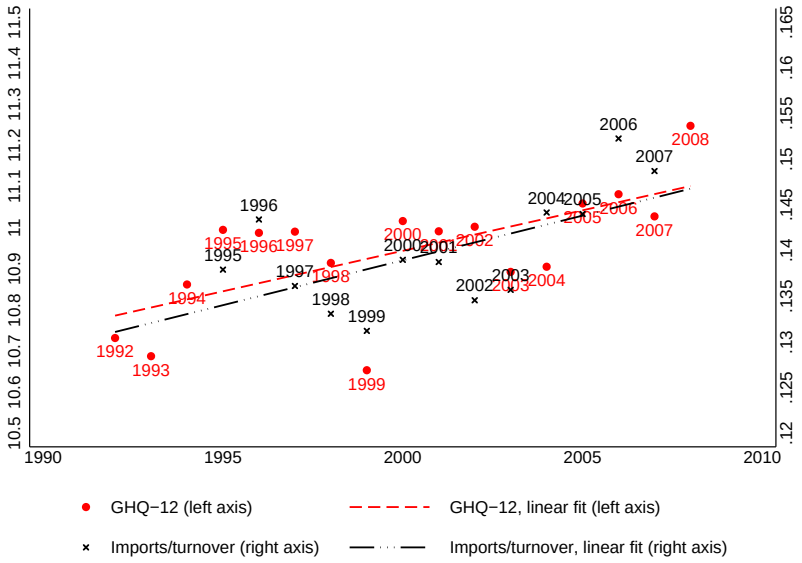
The empirical strategy we use for identifying the effect of trade exposure on mental distress consists of comparing GHQ-12 scores across workers who have similar individual characteristics and are employed in industries that have similar attributes but are hit by import shocks of different size. We condition the estimation on individual fixed effects, which remove time-invariant determinants of mental distress at the individual level (e.g., differences in risk factors) and imply that we exploit within-person variation over time for identification. We also control for full sets of sector×year, occupation×year, and local labor market×year fixed effects, which flexibly absorb any other time-varying determinant of mental distress operating at the sector, occupation, and local level. To account for possible remaining correlation between import competition and other domestic shocks to individual UK industries within

[3]See, e.g., Clark and Oswald (1994), Clark (2003), Oswald and Powdthavee (2008), MacKerron (2012), and Dustmann and Fasani (2016) for studies using GHQ-12 in the economic literature. See also Goldberg (1978), Easton and Turner (1991), Graetz (1991), Politi et al. (1994), Goldberg et al. (1997), Hu et al. (2007), McCabe et al. (2008), and Serrano-Aguilar et al. (2009) for papers using GHQ-12 in medicine and psychology.

[4]To the best of our knowledge, the BHPS is the only publicly available database with individual-level, longitudinal, information on mental health for a representative sample of residents over a long time span, coupled with a wealth of information on demographics, job histories, and family ties. In comparison, other databases containing information on individuals' health sometimes cover just a subset (typically the older part) of the population (e.g., the Health and Retirement Study for the US, the English Longitudinal Study of Ageing for the UK, and the Survey of Health, Ageing and Retirement for Europe). Other representative databases are either based on cross-sectional surveys, and thus do not allow researchers to follow individuals over time (e.g., the Behavioral Risk Factor Surveillance System for the US) or, when they have a panel structure, they do not report information on mental health in each year (e.g., the Socio Economic Panel for Germany reports mental health data once every two years, and the National Longitudinal Survey of Youth for the US only in some waves). In 2009, the BHPS was replaced by Understanding Society. The different sample composition, and the fact that each wave of Understanding Society spans two years instead of one, makes it difficult to combine the BHPS with Understanding Society for the purposes of our analysis.

[5]Source: Health and Social Care Data Center; 2003 is the first available year.

Figure 1: Import Competition and Mental Distress in the UK



Notes. Source: British Household Panel Survey (1992-2008); Eurostat-Comext; UK Office for National Statistics; and World Input-Output Database. GHQ-12 is an index that ranges from 0 to 36, with higher values indicating higher levels of mental distress. Each observation corresponds to the average value of the respective measure in a given year for the UK.

sectors, we use an instrumental variable (IV) approach. In a similar spirit to Hummels et al. (2014) and Bombardini et al. (2018), we construct an instrument that combines changes in the world export supply of foreign countries with pre-existing differences in the geographical composition of UK imports across industries. This IV strategy is meant to isolate the variation in UK imports due to changes in supply conditions in foreign countries. To avoid selection problems due to the potential sorting of workers across industries in anticipation of future trade shocks, we construct the instrument based on each worker's pre-sample industry of employment.

We find that import competition strongly worsens individual mental distress. Our estimates imply that a one standard deviation larger import shock (approximately equal to the difference between the industries at the 75th and 25th percentiles of the trade exposure distribution) raises GHQ-12 by 1.15 percentage points. This corresponds to about 12% of the within-individual standard deviation of mental distress. This effect is comparable to that of a commensurate increase in crime rates across UK local areas, as estimated by Dustmann and Fasani (2016).[6] To further quantify the effect, we compute the monetary compensation that a worker employed in the industry at the 75th percentile of the distribution by trade exposure would need to make up for her greater utility loss compared to a worker employed in the industry at the 25th percentile of the distribution. Mapping GHQ-12 scores into a health-based quality-of-life index, we find that this compensation would amount to £270 per person in a year.[7] A simple back-of-the-envelope calculation, which abstracts from any aggregate cost/benefit of import competition, suggests that the average import shock would entail a total annual compensation of roughly £5.2 billion across all workers, i.e., about 0.35% of GDP, or 4.3% of total healthcare expenditure,

[6] See also Cornaglia et al. (2014) for additional evidence on the effects of crime on mental health.

[7] To put this figure in perspective, the depreciation of the British pound following the Brexit vote is estimated to have cost the average UK worker an amount of £448 in a year in terms of reduced growth in real wages due to higher prices (Breinlich et al., 2017).

in the UK in 2007.

We provide an extensive discussion of the baseline results. First, we show that the estimates are unlikely to be driven by correlated demand shocks between the UK and foreign countries, or by underlying trends related to pre-existing differences in GHQ-12 across industries. We also perform a falsification test showing that future import competition does not explain past levels of mental distress. This further supports the view that our results reflect industry-level shocks due to rising trade exposure, rather than trends or time-varying confounds. Second, we use alternative sources of variation in UK imports for identification. In particular, we restrict attention to groups of countries that are more likely to have experienced significant supply shocks over the sample period (i.e., Eastern Europe, India, and China), or use exchange rates as an instrument for UK imports. By and large, we find that import competition worsens mental distress also in these exercises. Third, we show that the baseline evidence still obtains when fitting various alternative specifications. Finally, we find that import competition affects other proxies for mental distress, such as: the probability of reporting health problems related to anxiety and depression, or to the use of alcohol and drugs; the likelihood of becoming a heavy smoker and the number of cigarettes smoked; and the probability that GHQ-12 exceeds critical thresholds such as the one associated with suicidal ideation.

We compare the effects of import competition with those of other shocks related to globalization and technological progress. We find that, contrary to import competition, export shocks have either no or a mildly positive effect on individuals' mental health in our data. This evidence is broadly consistent with rising import competition being a most prominent aspect of trade integration for the UK over the sample period, as discussed above. Similarly, we find that technology shocks related to computerization and automation have no statistically significant impact on workers' mental distress. The latter result could also suggest that the implications of import competition for mental distress may be different from those of other facets of structural change.

Having studied how the mental distress of the average worker in an industry responds to import competition, we turn to investigating how these effects vary across workers within industries. Using alternative approaches, including recent techniques for the IV estimation of quantile regression models with fixed effects (Powell, 2016), we find the impact of trade exposure to grow monotonically, and sharply, in size along the distribution of GHQ-12. To further characterize the heterogeneity in the effects of import competition across workers within industries, we use information on demographic, occupational, and job characteristics. We find that the effects of trade exposure are systematically stronger for workers who are young, have a large family or a poor financial situation, are employed in blue-collar or tradable jobs, have a short tenure with the current employer, or are on a temporary contract. Overall, these novel results imply that trade exposure worsens inequality in subjective wellbeing not only by inducing a relative increase in mental distress for the average workers in more exposed industries, but also by widening the distribution of mental distress across workers within industries.

Next, we take advantage of information on family ties, a distinguishing feature of the BHPS, to study whether and how the effects of import competition spill over to other members of the family. We find that women's mental distress increases as a consequence of the import competition faced by their partners. We provide evidence that these spillovers are consistent with women being less satisfied with household income and the quality of marital relations as a consequence of their partners' import shocks.[8] Moreover, we find different pieces of evidence speaking to the existence of intergenerational

[8]For evidence on inter-spouse spillovers from other economic shocks such as unemployment, see, e.g. Clark (2003) and Marcus (2013).

spillovers from parents to children. In particular, the import competition faced by the father tends to have detrimental effects on parental investment in children, as well as on their self-esteem and life satisfaction. All these outcomes are known to have negative repercussions on the future health and labor market outcomes of the youths (e.g., Cunha and Heckman, 2007; Currie, 2009).[9]

Finally, we analyze a number of individual-level mechanisms that could underlie the effects of trade exposure on mental distress. We start by considering job displacement, given that unemployment and job losses are known to be associated with a significant worsening of mental health.[10] Consistent with this evidence, we find a strong positive correlation between job displacement and mental distress in our data. At the same time, we find that import competition substantially raises the likelihood for a worker to switch out of employment.[11] These findings suggest that trade exposure indeed increases mental distress through job displacement. Interestingly, however, we find that the effects of import competition are not limited to displaced workers, but also extend to continuously employed individuals. In particular, our evidence suggests that continuing workers are negatively affected by import competition as this: (i) lowers wage growth, (ii) reduces job satisfaction (in particular, regarding important working conditions such as job security and workload), and (iii) worsens expectations about future economic prospects. These are three changes of workers' profiles that we find to be strongly associated with higher mental distress in our data.[12]

Besides the work cited above, our paper connects with an emerging parallel literature studying how other aspects of globalization affect individual wellbeing. Hummels et al. (2016) study the role of exports. Using matched employer-employee data for Denmark, the authors find that export shocks, by expanding the scale of firms' operations, increase the risk of injuries and illness among Danish workers, as well as their use of antidepressants and different types of medical services including visits to psychiatrists. Conversely, using individual-level panel data for China, Crozet et al. (2018) find that export growth has contributed to increasing individuals' life satisfaction. Our evidence on export shocks is broadly consistent with these mixed results, which are likely to reflect the fact that, unlike import competition, export shocks may raise not only job-related stress but also income. Focusing on immigration, Giuntella and Mazzonna (2015) and Giuntella et al. (2016) find that this improves the health of natives by inducing them to switch to less risky jobs. Looking at industrializing countries, Bombardini and Li (2016) find that the recent Chinese export growth has raised infant mortality across Chinese prefectures by increasing the level of pollution. Finally, Giuntella et al. (2018) find that imports of unhealthy food from the US have raised the prevalence of obesity across Mexican states. Our work complements these studies by highlighting a different, and not yet fully understood, mechanism through which globalization may affect individual wellbeing.

Our paper also connects with the broader empirical literature on the implications of import compe-

[9] Our finding that trade exposure entails intergenerational spillovers complements a recent empirical literature studying how parental socio-economic background affects child development. For instance, Johnston et al. (2013) and Persson and Rossin-Slater (2018) study how family shocks (e.g., ruptures) or parental mental conditions influence the wellbeing of children. Focusing on developing countries, Baird et al. (2013) and Adhvaryu et al. (2018) find that positive household income shocks in early life affect children's personality traits and future wellbeing. See Currie (2009) and Almond et al. (2018) for updated surveys of this literature.

[10] See, among many others, Ruhm (2000), Clark (2003), Sullivan and Von Wachter (2009), Tefft (2011), Marcus (2013), Black et al. (2015), Case and Deaton (2017), Hollingsworth et al. (2017), Almond et al. (2018), and Farré et al. (2018).

[11] The effect of import competition on job displacement is in line with the recent literature on the labor market effects of import competition cited at the end of this section.

[12] The correlation we find between wage growth and GHQ-12 complements the evidence from studies analyzing how mental health responds to extreme wealth shocks, such as winning a lottery or experiencing a stock market crash (e.g., Ettner, 1996; McInerney et al., 2013). For recent theoretical models on the psychological implications of job satisfaction, see Wälde (2018) and Iossa and Sacco (2018).

tition for the labor markets of developed countries (e.g, Autor et al., 2013, 2014, 2015; Dauth et al., 2014, 2018; Felbermayr et al., 2011; Pierce and Schott, 2016; Utar, 2014, 2018; see Autor, Dorn and Hanson, 2016, and Dorn, 2018, for updated reviews). These papers show that workers employed in import competing industries, or regions, bear significant adjustment costs to import competition, in terms of higher probability of job displacement and lower wages. Our findings suggest that trade exposure implies additional, non-pecuniary, adjustment costs for these workers, in the form of increased mental distress. These costs may also extend to workers who do not witness significant changes in their labor market outcomes, through a reduction in job satisfaction and worsened expectations about the future. Clearly, because our results are identified through differences in import pressure across industries, they capture the relative effect of trade exposure. Similar to this literature, therefore, our findings do not speak to the overall welfare effects of globalization but to its distributional consequences.

The rest of the paper is organized as follows. Section 2 presents the data and the main variables used in the analysis. Section 3 illustrates our empirical specification and identification strategy. Section 4 presents some preliminary evidence. Section 5 discusses the empirical results. Section 6 concludes.

2. Data and Main Variables

2.1. The British Household Panel Survey

Our main data source is the British Household Panel Survey. The BHPS is a multi-purpose database covering a nationally representative sample of the British population aged 16 or more from 1991 to 2009. Each individual is interviewed every year, so the BHPS is a panel data set. The survey is household based, meaning that each person within a sampled household is interviewed yearly. If an individual leaves the original household to form a new one, she keeps being interviewed, and all the new family members also become part of the survey. The first wave of the BHPS covered approximately 5,500 households drawn from 250 areas of Great Britain, and included about 10,300 individuals. Then, 3,000 additional households were added to the sample in 1999; these households were equally split between Scotland and Wales. Finally, 2,000 households from Northern Ireland were included in 2001.[13]

To shed light on the representativeness of the BHPS at the national level, Table 1 compares the BHPS with the UK Census in the year 2001.[14] While the Census does not report information on mental health—thereby preventing us from assessing the representativeness of the BHPS in terms of mental distress directly—we compare several individual- and household-level variables that are present in both databases and that are known to be important correlates of mental health according to the economic, psychology, and medicine literature; these variables will serve as controls in our empirical analysis. We provide a comparison for the entire sample of individuals (columns 1 and 2), as well as for the subsample of employed and self-employed workers (columns 3 and 4), which constitute the population of interest in our empirical analysis. For each variable, we report its average computed on each sample of individuals, both in the BHPS and in the Census. Remarkably, the BHPS figures closely resemble

[13]The sampling methodology for Wave 1 was a two-stage stratified systematic method. The frame employed for the selection of sample units was the small users Postcode Address File (PAF), which is a standard choice for large government surveys in Great Britain. In the first stage of the sampling process, 250 postcode sectors were selected as primary sampling units (PSUs) from an implicitly stratified listing of PAF sectors using a systematic sampling method. The second stage involved the selection of delivery points (i.e., approximately addresses) within each sector, using an analogous systematic procedure. All households at each sampled address were included in the survey, up until three. In case more than three households were living at the same address, a random selection of three households was made by the interviewers at the time of fieldwork. A fully equivalent approach was adopted in the two subsequent extensions of the sample. See Taylor et al. (2010) for full details on sampling and survey methods.

[14]Census data are obtained from IPUMS-International (Ruggles et al., 2003).

Table 1: Comparison between the BHPS and the UK Census

	Full Sample		Sample of Workers	
	BHPS (1)	Census (2)	BHPS (3)	Census (4)
Age	45.35	46.17	39.30	39.53
Male	0.46	0.48	0.52	0.54
Married	0.53	0.50	0.58	0.54
Divorced	0.05	0.08	0.05	0.08
Separated	0.02	0.02	0.02	0.03
Single elderly	0.08	0.02	0.01	0.00
Couple, no children	0.29	0.29	0.26	0.26
Couple, dep. children	0.31	0.27	0.39	0.35
Couple, non-dep. children	0.12	0.11	0.15	0.14
Lone parent, dep. children	0.05	0.05	0.04	0.04
Lone parent, non-dep. children	0.04	0.04	0.04	0.04
Household size	2.88	2.77	3.06	2.99
Owned house or on mortgage	0.72	0.71	0.80	0.79

Notes. Source: British Household Panel Survey and UK Census for the year 2001. The sample of workers consists of individuals who were either employed or self-employed in 2001. All figures are simple averages.

their Census counterparts across all variables, showing that the BHPS is highly representative at the national level in terms of important correlates of mental health. Importantly, the BHPS figures are close to the Census figures not only for the whole population of UK residents but also for the sub-sample of employed and self-employed workers.

Next, we go one step further and discuss the coverage and representativeness of the BHPS at a finer level of detail, i.e., across industries. This comparison is important for our purposes, given that our empirical analysis exploits differences in import competition across industries and that the BHPS is not explicitly designed to be representative at the industry level. Ideally, we would like to compare the BHPS and the Census across the 119 disaggregated industries that we use in the empirical analysis. Unfortunately, however, the UK Census does not provide such a disaggregated industry breakdown. Hence, we perform the comparison at the finest level of industry disaggregation allowed for by the UK Census, i.e., across fifteen NACE Rev. 1.1 industries. To begin with, we compare the BHPS and the Census in terms of industry coverage. In particular, we compute the share of employed individuals in each industry according to the BHPS and the Census, and then compare the two distributions of employment shares. The results are reported in Table 2. Strikingly, the cross-industry distribution of employed individuals in the BHPS matches very well the corresponding distribution in the Census. As a summary measure, the correlation between the BHPS and the Census employment shares across the fifteen industries is 0.96. Overall, this evidence suggests that the BHPS reproduces well the industrial composition of employment in the UK.

To further shed light on the coverage of the BHPS at the industry level, we repeat the comparison performed in Table 1 separately for each of the fifteen industries listed in Table 2. The purpose of this exercise is to study how important correlates of mental distress are reproduced in the BHPS not only in the aggregate but also across individual industries. We find that the BHPS provides a remarkably good coverage of the main correlates of mental distress also at the industry level (Table A1). As a summary measure, the correlation between the BHPS and the Census figures across the fifteen industries is equal to 0.80 on average across all variables, with a median of 0.85. Overall, the above analysis suggests that the BHPS is a meaningful data source, in terms of coverage and representativeness, for our empirical analysis.

We now discuss patterns of attrition in the BHPS. The nature of the survey implies that some individuals may not be observed in all years. In particular, some individuals belonging to surveyed house-

Table 2: Comparison of Industries' Employment Shares in the BHPS and UK Census

Industry Description	Industry Code	Employment Share	
		BHPS	Census
Agriculture, hunting, forestry and fishing	A-B	0.023	0.016
Mining and quarrying	C	0.004	0.003
Manufacturing	D	0.166	0.148
Electricity, gas and water supply	E	0.007	0.007
Construction	F	0.068	0.069
Wholesale and retail trade, repairing	G	0.137	0.166
Hotels and restaurants	H	0.039	0.048
Transport, storage and communication	I	0.060	0.069
Financial intermediation	J	0.041	0.047
Real estate, renting and business activites	K	0.101	0.127
Public administration, defence, social security	L	0.080	0.060
Education	M	0.093	0.077
Health and social work	N	0.123	0.111
Other community, social and personal services	O	0.055	0.051
Activities of households	P	0.004	0.001

Notes. Source: British Household Panel Survey and UK Census for the year 2001. Industry codes refer to the NACE Rev 1.1 classification. The figures correspond to the share of employed individuals in each industry.

holds may turn 16—and thus start to be interviewed—over the sample period. Other individuals may join existing surveyed households, or form new families with members of households that are already present in the survey. Finally, some people may die over the period of analysis or may not report their information in some years. The wave-on-wave retention rate in the BHPS is known to be very high, at approximately 95% (Lynn, 2006). Investigating the reasons for not participating in the interview we find that, on average across all BHPS waves, 3.9% of individuals refuse outright, 0.7% of individuals have died since the previous year, and 0.7% of individuals do not participate for other reasons. In Section 3, we further show that entry and exit of individuals in our estimation sample, besides being quantitatively modest, is also uncorrelated with both mental distress and import competition.

Overall, the BHPS has a number of features that are crucial for our analysis. In particular, it provides rich information on mental health for each individual over time, along with a wealth of individual, household, and job characteristics including demographics, job history, industry of employment, and occupation. We use the information on the industry of employment to match the individual-level data from the BHPS with measures of import competition and other industry characteristics (described below). Finally, the BHPS contains information on intra-household relations, allowing us to link each individual to her spouse and children. The richness of the resulting data set allows us to: (i) study the individual-level response of mental distress to import competition; (ii) explore heterogeneity in the effects of trade exposure across workers within industries; (iii) study intra-household spillovers; and (iv) investigate individual-level mechanisms underlying the effects of import competition on mental distress.

2.2. The Measure of Mental Distress

Our main measure of mental distress is the 12-item version of the Generalized Health Questionnaire indicator (GHQ-12), which is available in each wave of the BHPS. GHQ-12 is based on twelve questions related to three clinically meaningful factors: anxiety and depression, social dysfunction, and loss of confidence. Each question can be answered in four ways denoting different levels of distress. Answers are assigned a value from 0 to 3, so that higher numbers always indicate higher mental distress relative to the reference condition of the individual. The twelve questions and the four answers are listed in Table 3. The GHQ-12 indicator is obtained as the sum of the values taken by the answers to the twelve

Table 3: GHQ-12 - Questions and Answers

GHQ-12 Component	Questions and Answers
	Questions
	Have you recently:
Anxiety and depression	1) lost much sleep over worry?
	2) felt constantly under strain?
	3) felt you couldn't overcome your difficulties?
	4) been feeling unhappy or depressed?
Social dysfunction	5) been able to concentrate on whatever you're doing?
	6) felt that you were playing a useful part in things?
	7) felt capable of making decisions about things?
	8) been able to enjoy your normal day-to-day activities?
	9) been able to face up to problems?
	10) been feeling reasonably happy, all things considered?
Loss of confidence	11) been losing confidence in yourself?
	12) been thinking of yourself as a worthless person?
	Answers
	not at all; no more than usual; rather more than usual; much more so than usual

Notes. Source: British Household Panel Survey.

questions. As such, it ranges from 0 (lowest level of distress) to 36 (highest level of distress).[15] In our regressions, we rescale the index to range between 0 and 100, so that each regression coefficient can be interpreted as the percentage point effect of the corresponding variable on mental distress.

A large literature in medicine and psychiatry shows that GHQ-12 has remarkable properties. In particular, it correlates well with the main symptoms of depression and nicely reflects both upward and downward variations in mental health (e.g., Graetz, 1991; Politi et al., 1994; Goldberg et al., 1997; Hu et al., 2007; McCabe et al., 2008). For these reasons, GHQ-12 is widely used by clinicians to detect psychiatric illness (Goldberg, 1978; Serrano-Aguilar et al., 2009) and its use in academic research on mental health is nowadays standard across different disciplines, including economics (see, most notably, Clark and Oswald, 1994; Clark, 2003; Oswald and Powdthavee, 2008; MacKerron, 2012; Dustmann and Fasani, 2016). More importantly for the purpose of this paper, using GHQ-12 allows us to capture the entire spectrum of mental distress cases, including those that do not evolve into extreme clinical conditions measurable through proxies such as use of antidepressants, hospitalization, and suicides.

GHQ-12 is a relative measure of mental distress, since each person must answer every question compared to her usual condition, which could change over time. Indeed, recent studies document that, after significant economic shocks, the reference point changes gradually and takes approximately five years to reach its new level (Clark and Georgellis, 2013; Ferrer-i Carbonell and Van Praag, 2008). As a consequence, while the level of GHQ-12 provides a good measure of the mental health of the individual at a given point in time, changes in GHQ-12 over time—especially over long horizons—are not fully informative of the change in mental distress experienced by the individual, as they compound variations in the state of mental health of the individual with adjustments in her reference point. In particular, the same change in GHQ-12 could be observed for individuals whose mental health has changed in different ways or has even remained constant, thereby making the comparison of GHQ-12 changes across individuals problematic.[16] In our preferred specification, we therefore use GHQ-12 in

[15] This is known as 'Likert scoring method'. Our results are robust to the use of an alternative scoring technique, known as 'Caseness bimodal scoring', in which the two answers corresponding to the lowest levels of distress are assigned a value of 0 and the other two answers a value of 1, with the resulting GHQ-12 ranging from 0 to 12.

[16] For instance, consider two individuals, of which one has received a negative shock to mental health while the other has not. Suppose to compute the change in GHQ-12 for these two individuals over a certain period of time. For the second individual, the change in GHQ-12 is obviously zero. However, for the first individual, the change in GHQ-12 could also be null, if her reference

levels. Since we control for individual fixed effects, which soak up time-invariant differences in the reference point (and any risk factor) across individuals, we exploit short-run (year-on-year) deviations of GHQ-12 from its within-individual mean for identification.[17]

2.3. *The Measure of Import Competition*

Our baseline measure of trade exposure for a worker in a given year is the growth of real imports in her industry of employment. More precisely, for worker i in year t, the measure of import competition is constructed as follows:

$$IS^{k}_{\psi(i,t-1),t} = \ln\left(Real\ imports_{\psi(i,t-1),t-1}\right) - \ln\left(Real\ imports_{\psi(i,t-1),t-1-k}\right) , \quad (1)$$

where $\psi(i, t-1)$ indicates the industry in which individual i was employed in year $t-1$ and k is the number of years over which the log change in real imports is computed.[18] We label this variable IS to stand for *import shock*. Since our specifications control for pre-shock industry output (see below), we benchmark the import shock against the initial size of the industry. We define IS in the worker's industry of employment at $t-1$ for two reasons. First, individuals in the BHPS are interviewed in different months, so this definition ensures that every individual has been exposed to the shock for at least one full year. Second, and more importantly, this definition allows us to consider job displacement among the possible channels through which import competition affects mental distress (see Section 5.4). By contrast, if we defined IS for the worker's industry of employment in year t, our estimation sample would only comprise individuals who are currently employed, and would thus exclude individuals who have switched out of employment between $t-1$ and t as a consequence of the import shock.

Regarding the choice of the period (k) over which IS is defined, we face a trade-off. On the one hand, imports are volatile over short time horizons, and this volatility need not reflect the type of protracted changes in trade exposure that could have implications for individuals' mental distress. This consideration would suggest us to consider changes in imports over long time horizons. On the other hand, using longer periods may raise concerns with confounding factors as, over long time horizons, changes in individual and industry characteristics potentially correlated with import competition are more likely to happen. Using longer periods also shortens the estimation sample and forces us to use information on GHQ-12 only for more recent years. We deal with this trade-off by using $k = 5$ for our baseline definition of the shock. In Section 5.1.4, we study the sensitivity of the results to the use of periods of longer length, finding no qualitative change in our main conclusions.

To construct IS, we link the individual-level data from the BHPS with data on imports at the industry level. We observe workers employed in 119 industries (mostly classified at the 3-digit level of the NACE Rev. 1.1 classification) spanning the entire UK economy. Out of these industries, 100 are in the manufacturing sector and the remaining 19 are in the service sector. For the manufacturing industries, we source trade data from Eurostat-Comext while, for the service industries, we use official trade data from

point had fully adjusted over the period. Hence, the changes in GHQ-12 for these two individuals would be observationally equivalent, even though the first person has experienced years of higher mental distress while the second person has not.

[17] Controlling for individual fixed effects also mitigates concerns with the fact that individuals may have different 'reporting functions' (Bond and Lang, 2018), such that two people with the same inner level of mental distress may systematically end up having two different values of GHQ-12. Moreover, in Section 5.1.5, we construct alternative measures of mental distress by benchmarking GHQ-12 against some relevant thresholds (i.e., for psychiatric disorder or suicidal ideation). While there might be some noise in the levels of GHQ-12, this noise is unlikely to systematically determine whether an individual falls above or below a certain threshold. In addition, we corroborate our main results using alternative, indirect, proxies for mental distress.

[18] See, for instance, Liu and Trefler (2018) for the use of a similar measure. In Appendix B, we show that our results are robust to the use of alternative definitions of import competition.

WIOD.[19] The first year with complete trade data for all industries is 1995. Including both manufacturing and service industries in our analysis is important for representativeness. Indeed, in 2007, manufacturing and services employed 12 and 56%, respectively, of the total UK labor force (World Input-Output Database; Timmer et al., 2015), and accounted for 68 and 32%, respectively, of UK imports of goods and services (World Development Indicators). Moreover, over 1995-2007, the composition of UK imports has changed, with the share of manufacturing in total imports falling by 8 percentage points and the share of services rising accordingly.[20]

3. Empirical Strategy and Estimation Sample

Our aim is to study whether individuals working in more trade exposed industries have different levels of mental distress compared to individuals working in less trade exposed industries. The identification strategy we use for estimating the effect of import competition on individuals' mental distress consists of comparing levels of GHQ-12 (or other proxies for mental distress) across workers who have similar individual characteristics, live in similar households, and are employed in industries that have similar attributes but are hit by import shocks of different size.

To operationalize this strategy, we estimate variants of the following specification:

$$\begin{aligned} MD_{i,t} =& \beta_1 IS^5_{\psi(i,t-1),t} + \mathbf{I}_{i,t-6}\,\boldsymbol{\beta}_2^{'} + \mathbf{J}_{\psi(i,t-1),t-6}\boldsymbol{\beta}_3^{'} + \\ &+ \alpha_i + \alpha_{\sigma(i,t-1),t} + \alpha_{\omega(i,t-1),t} + \alpha_{\lambda(i,t-1),t} + \alpha_m + \alpha_h + \varepsilon_{i,t}\ , \end{aligned} \tag{2}$$

where $MD_{i,t}$ denotes the mental distress of individual i in year t; $IS^5_{\psi(i,t-1),t}$ is the import shock undergone by individual i in year t, based on the industry $\psi(i,t-1)$ in which the individual was employed or self-employed in year $t-1$; $\mathbf{I}_{i,t-6}$ and $\mathbf{J}_{\psi(i,t-1),t-6}$ are vectors of controls for pre-shock individual and industry characteristics, respectively; α_i are individual fixed effects; $\alpha_{\sigma(i,t-1),t}$, $\alpha_{\omega(i,t-1),t}$, and $\alpha_{\lambda(i,t-1),t}$ are sector×year, occupation×year, and local labor market (LLM)×year fixed effects, respectively, based on the sector, occupation, and LLM of the individual in year $t-1$; α_m and α_h are fixed effects for the month and the hour of the interview; and $\varepsilon_{i,t}$ is an error term.

The specification in eq. (2) relates levels of mental distress to growth in imports. Using GHQ-12 in levels accounts for the relative nature of this measure, as discussed in Section 2.2.[21] Defining import competition using import growth accounts for the fact that some industries are normally more open than others, so a higher level of imports in these industries need not represent a shock from the workers' perspective. Moreover, structural factors known to the worker may induce a secular trend in imports in some industries. Such secular changes in imports could be anticipated by the individual and thus have no effect on her mental distress. By controlling for individual fixed effects, α_i, our specification identifies the coefficient β_1 only when import growth deviates from a linear trend, which may capture a secular change in imports. Because the individual fixed effects also soak up all time-invariant determinants of mental distress at the individual level, a positive estimate of β_1 indicates that the mental distress of an

[19] We deflate the nominal value of trade flows obtained from these sources using the UK Consumer Price Index sourced from the UK Office for National Statistics.

[20] The growing importance of services in total imports has been previously documented for the UK (Amiti and Wei, 2005) and reflects a trend that is common to other developed countries (see, e.g., Crinò, 2010, and Liu and Trefler, 2018, for evidence on the US).

[21] Similar to GHQ-12, other variables used later on in our analysis are hard to interpret in changes; these variables include, e.g., the proxies for job satisfaction and expectations used in Section 5.4. Some other variables can inherently be observed only for a few years for each individual, and thus cannot be used in differences; these variables include, e.g., the characteristics of the youth used in Section 5.3.

individual is above the within-individual average in years in which imports have grown above a linear trend.

In Section 5.1.4, we discuss the sensitivity of the results to the choice of specification. In particular, we fit a number of alternative models that relate changes in mental distress to changes in imports over periods of different length. These models allow us to relate more directly our findings to some recent studies that have used a similar approach for investigating the labor market consequences of import competition (e.g., Autor et al., 2013; Acemoglu et al., 2016). While our main evidence is preserved also across these alternative specifications, the nature of GHQ-12 motivates our choice of eq. (2) as the baseline specification, for the reasons discussed earlier.

The control variables included in eq. (2) are meant to absorb time-varying determinants of mental distress potentially correlated with import competition. Crucially, the fixed effects $\alpha_{\sigma(i,t-1),t}$, $\alpha_{\omega(i,t-1),t}$, and $\alpha_{\lambda(i,t-1),t}$ flexibly control for many possible confounds operating at the sector, occupation, and local level. Specifically, $\alpha_{\sigma(i,t-1),t}$ accounts for sector-specific shocks, such as technological progress and financial shocks. We define sectors as 2-digit industries.[22] Accordingly, after controlling for $\alpha_{\sigma(i,t-1),t}$, identification only relies on the remaining variation in IS across the 3-digit industries belonging to the same 2-digit sector. $\alpha_{\omega(i,t-1),t}$ absorb occupation-specific shocks, such as the introduction of a new labor regulation or differential changes across occupations in their exposure to technical change and globalization.[23] Finally, $\alpha_{\lambda(i,t-1),t}$ control for LLM-specific shocks such as crime, health policies, changes in the supply of health care services, and both technology and globalization shocks at the local level.[24] The three sets of fixed effects also account for potential time-varying compositional effects, in that they also absorb sector-, occupation-, and region-specific changes in average individual characteristics potentially correlated with IS. Finally, α_m and α_h control for potential fluctuations in mental distress across the different months and hours of the day in which each interview takes place; previous studies show that these fluctuations could be large for some individuals (e.g., Connolly, 2013).

The vectors $\mathbf{I}_{i,t-6}$ and $\mathbf{J}_{\psi(i,t-1),t-6}$ contain controls for observable individual and industry characteristics measured six years before the current realization of mental distress, i.e., before each import shock unfolds. $\mathbf{I}_{i,t-6}$ contains standard demographics: household size; dummies for age, educational level, marital status, self-employment, household type, and home ownership; and an index of physical health.[25] Since eq. (2) includes individual fixed effects, all individual controls are identified from within-individual variation over time in those variables. $\mathbf{J}_{\psi(i,t-1),t-6}$ contains industry characteristics: real output, to benchmark the import shock against the initial size of the industry; real value added, to control for differences in productivity that could be associated with differential import growth across industries; output price, to control for differences in the degree of domestic competition that could be correlated with differences in foreign competition; employment share of high-skill workers, to control

[22] The service industries are less disaggregated than the manufacturing industries, and are thus treated as a single sector.

[23] We define occupations as major occupational codes in the Standard Occupational Classification (SOC).

[24] In the UK, LLM are defined as travel-to-work areas. To identify these areas, we obtained access to restricted data on the location of each household at the postcode level ('lower layer super output areas'), and mapped this information into travel-to-work areas using a correspondence table provided by the UK Office for National Statistics.

[25] The index of physical health is based on eleven BHPS questions. Each question asks the respondent to report whether or not she suffered from a specific health problem in each year. The indicator is computed as the sum of the scores obtained in each question: 0 in case of no problem and 1 in case of reported problems. The indicator is then rescaled to range between 0 and 100. The eleven health questions concern problems with: arms, legs, neck and the like (including arthritis and rheumatism); sight; hearing; skin conditions and allergies; chest/breathing; hearth/blood pressure and circulation; stomach, liver, kidneys and digestion; diabetes; epilepsy; migraine or frequent headaches; other. We use earlier values of a given individual characteristic when its sixth lag is missing. The age dummies are identified despite the inclusion of individual and year fixed effects because in the BHPS the same individual is not necessarily interviewed in the same month in all waves. Appendix Figure A1 plots the life cycle profile of mental distress, showing that the latter first increases with age, and then declines after 50 years of age.

for differences in factor intensities that are standard determinants of trade; export intensity (exports over output), to control for differences in export exposure across industries; and the share of workers employed in routine-intensive occupations, to control for differences in the predisposition to technological progress and automation across industries.[26]

The large sets of controls and fixed effects included in eq. (2) substantially mitigate concerns with omitted variables. The OLS estimate of β_1 could still be biased, however, for two reasons. First, even after accounting for sector×year fixed effects, some confounding factor may remain that correlates with MD and IS across narrow 3-digit industries. For instance, a positive domestic demand shock in an industry could raise imports and lead to an improvement in the mental health of workers employed in that industry, causing a downward bias in the OLS estimate of β_1. Conversely, technological shocks or structural transformation could put some industries on a declining path, causing greater distress for workers and increasing reliance on foreign imports, thereby leading to an upward bias in the OLS estimate of β_1. Second, workers may sort across industries based on their mental distress and in anticipation of future import competition. If more mentally distressed individuals sorted into less trade exposed industries, the OLS estimate of β_1 would be downward biased; the opposite sorting pattern would instead induce an upward bias.

To account for these issues, we use an IV approach. In a similar spirit to Hummels et al. (2014) and Bombardini et al. (2018), we construct an instrument for IS that combines changes in the world export supply (WES) of foreign countries with pre-existing differences in the geographical composition of UK imports across industries. Specifically, the instrument is constructed as follows:

$$WES\,Shock^{5}_{\psi(i,0),t} = \ln\left(\sum_{c}\mu_{c,\psi(i,0),t-6}\times WES_{c,\psi(i,0),t-1}\right) - \ln\left(\sum_{c}\mu_{c,\psi(i,0),t-6}\times WES_{c,\psi(i,0),t-6}\right), \quad (3)$$

where $\psi(i,0)$ denotes worker's i pre-sample industry of employment; $\mu_{c,\psi(i,0),t-6}$ is the share of foreign country c in total UK imports in industry $\psi(i,0)$ at time $t-6$;[27] and $WES_{c,\psi(i,0),t-1}$ and $WES_{c,\psi(i,0),t-6}$ denote exports by country c to the world, minus the UK, in industry $\psi(i,0)$ at $t-1$ and $t-6$, respectively. The instrument is meant to isolate the variation in UK imports that is due to changes in supply conditions in foreign countries, rather than to domestic industry-specific shocks in the UK. To this purpose, the instrument exploits changes in foreign countries' export supply, which could be driven by several factors that have been prominent in many countries over our sample period. These factors include: rapid technical change, which has induced reductions in production costs, expansions in quality ladders, and increases in the number of exported varieties; reductions in trade costs, which have favored firm participation into exporting activities; financial shocks, which have affected the cost of financing export activities; and changes in factor supplies and in the quality of institutions, which had a direct impact on comparative advantage.[28] The instrument weights the world export supply of each country

[26] We source information on real output and value added, output price, and the employment share of high-skill workers from the UK Office for National Statistics for the manufacturing industries and from WIOD for the service industries. To construct export intensity, we use trade data from Eurostat-Comext for the manufacturing industries and from WIOD for the service industries. To construct the share of workers in routine-intensive occupations, we use the index of routine intensity introduced by Autor and Dorn (2013) and converted into the ISCO-88 occupational classification by Goos et al. (2009). Following Autor and Dorn (2013), we define as routine-intensive all occupations falling in the top tercile of the distribution of this index. Then, we compute the share of employment by occupation in each industry and year using micro-level data from the UK Labor Force Survey. With these shares in hand, we compute the share of employment in routine-intensive occupations as the sum of employment shares across all routine-intensive occupations in each industry and year.

[27] In particular, $\mu_{c,\psi(i,0),t-6} \equiv Imports_{c,\psi(i,0),t-6}/Imports_{\psi(i,0),t-6}$.

[28] For evidence on the expansion of exported varieties and quality ladders in world trade flows, see, e.g., Broda and Weinstein (2006); Colantone and Crinò (2014) and Feenstra and Romalis (2014). Bombardini et al. (2012); Romalis (2004); Helpman

by its pre-existing share in UK imports. This implies that changes in foreign export supply have differential effects on UK imports depending on the pre-shock relative importance of foreign countries in the geographical composition of UK imports.[29] Crucially, for each worker we construct the instrument in her pre-sample industry of employment, $\psi(i,0)$, so that worker cross-industry sorting does not induce a correlation between the instrument and the error term in eq. (2).[30]

The identifying assumption is that, conditional on all the covariates and fixed effects included in eq. (2), the instrument in eq. (3) is uncorrelated with the error term. There are two main threats to identification. The first is that changes in foreign countries' exports may reflect not only supply shocks occurring in these countries, but also demand shocks occurring around the world and in the UK. We exclude from the construction of the baseline instrument both the US and Canada, two economies that are likely to have correlated demand shocks with the UK, given the known similarities in their industrial structure and cyclical fluctuations with those of the UK (Helpman et al., 2004; Artis et al., 2004). In Section 5.1.2 and 5.1.3, we also show that our evidence is unchanged when we restrict even further the set of origin and destination countries used to define the instrument, and when we exploit alternative sources of variation in UK imports. The second threat to identification is the possible existence of heterogeneous trends in mental distress correlated with the geographical composition of imports across industries (i.e., with the shares μ). These trends may result in different levels of mental distress for workers employed in those industries even in the absence of import shocks. In Section 5.1.2, we use different ways of controlling for heterogeneous trends, as well as a placebo exercise, showing that our estimates are not sensitive to this issue.

Finally, turning to our estimation sample, note that the inclusion of individual fixed effects implies that eq. (2) is estimated on workers whose GHQ-12 is reported for two years or more. Moreover, since the construction of IS entails the use of six years of data and the instrument $WES\ \ Shock$ is based on the pre-sample industry of employment, the individuals included in our sample must be observed, and have information on industry of employment, at least seven years before the first observation of GHQ-12 used in the estimation. Hence, given that the trade data are available since 1995, our estimation sample starts with the 2001 wave of the BHPS and ends in 2007, the year before the Great Recession. We use previous waves of the BHPS (i.e., for 2000 or earlier) to retrieve information on individuals'

et al. (2008); Manova (2012) and Nunn and Trefler (2014), among others, discuss the importance of changes in factor intensities, reductions in trade costs, financial shocks, and changes in institutional quality for countries' comparative advantage and export flows.

[29] To construct the instrument for manufacturing industries, we use product-level trade data for all countries in the world sourced from BACII, and we aggregate these data at the industry level used in our analysis using correspondence tables between the Harmonized System, SITC and NACE classifications. For the service industries, we use trade data from WIOD. We aggregate small countries accounting for tiny shares of less than one percent of UK imports at the beginning of the sample to reduce noise. For robustness, we have experimented with two alternative versions of the instrument in eq. (3). The first version is computed as the weighted average of log changes in foreign countries' exports:

$$WES\ Shock^{5}_{\psi(i,0),t} = \sum_{c} \mu_{c,\psi(i,0),t-6} \times \left(\ln WES_{c,\psi(i,0),t-1} - \ln WES_{c,\psi(i,0),t-6} \right).$$

Unlike the version of the instrument in eq. (3), this definition tends to exacerbate the weight of small exporting countries, as any given increase in exports corresponds to a larger log change in exports for lower initial export values. The second version of the instrument is constructed using time-invariant import shares at the beginning of the sample (i.e., in 1995):

$$WES\ Shock^{5}_{\psi(i,0),t} = \ln \left(\sum_{c} \mu_{c,\psi(i,0),95} \times WES_{c,\psi(i,0),t-1} \right) - \ln \left(\sum_{c} \mu_{c,\psi(i,0),95} \times WES_{c,\psi(i,0),t-6} \right).$$

This definition of the instrument does not include supply shocks of countries with initial shares equal to zero and thus captures variation in UK imports only along an intensive margin. Despite these differences, in Appendix B.3, we show that our results are remarkably robust to the use of these alternative ways of constructing the instrument (see Figure A2).

[30] At the same time, sorting in the pre-sample industry of employment is accounted for by the individual fixed effects.

demographics and job histories. For concreteness, consider an individual who is observed for the first time in the labor market prior to 1995. Her first trade shock is the change in imports between 1995 ($t-6$) and 2000 ($t-1$), the pre-sample industry of employment $\psi(i,0)$ refers to 1994 or earlier, and the first observation of GHQ-12 used for estimation refers to 2001 (t). If instead an individual is observed for the first time in the labor market in 1995 or later, we proceed as follows. For concreteness, take an individual who is observed for the first time in 1998. We construct the first shock as the change in imports from 1999 to 2004, take 1998 as the pre-sample industry of employment, and use GHQ-12 scores from 2005 onwards.

The estimation sample consists of 29,405 observations corresponding to 7,044 individuals. Each individual is observed on average for 5.5 out of 7 years (i.e., 2001-2007), and the median individual is observed for 6 years. The average entry rate of individuals in the estimation sample is 2.2% and the average exit rate is 3.2%. Regressing a dummy equal to 1 for individuals who enter the sample on current import competition, current mental health, and year fixed effects, we obtain coefficients equal to 0.00007 (s.e. 0.00007) for mental health and to 0.00108 (s.e. 0.00092) for import competition. Similarly, regressing a dummy equal to 1 for individuals who exit from the sample on lagged import competition, lagged mental health, and year fixed effects, we obtain coefficients equal to -0.00002 (0.00008) for mental health and to -0.00063 (0.00107) for import competition. Importantly, these results imply that, besides being limited, individuals' entry to, and exit from, the estimation sample is uncorrelated with both import competition and mental distress.[31]

4. Descriptive Statistics and Preliminary Evidence

Table 4 reports summary statistics on the individual-level variables used in the analysis. For each variable, the first three columns show the mean, standard deviation, and number of observations in the final estimation sample. As discussed above, this sample results from imposing the conditions implied by the empirical specification on the whole sample of employed and self-employed individuals, which constitute the population of interest for our analysis. Hence, for comparison, the last three columns of the table report the same statistics for the whole sample of employed and self-employed workers in the BHPS.[32] The two samples have a similar composition. The average age of individuals is 44 years, and there is an equal proportion of males and females. Three-fourths of the sample consist of individuals who are married or live as a couple, either with no dependent children (44%) or with some dependent child (37%). Average household size is 3 people. Roughly 20% of individuals have first or higher degrees of education, approximately 40% have some form of higher qualification, while 9% of people have no qualification. Finally, 85% of workers own a house and 13% live in a rented flat.

Turning to the mental health indicators, GHQ-12 is equal to 30 (on a 0-100 scale) on average, with an overall standard deviation of 14.2. The within-individual standard deviation (untabulated) is equal to 9.6, which corresponds to 67% of the overall variation in GHQ-12. Table 4 also reports information on the three components of GHQ-12 related to anxiety and depression, social dysfunction, and loss of confidence. Each component is computed by summing the answers to the corresponding questions (see Table 3) and is rescaled between 0 and 100. The two components of GHQ-12 related to anxiety and depression and social dysfunction are slightly higher than the one related to loss of confidence, the

[31] These results are consistent with previous studies showing that attrition in the BHPS is not related to mental health measures, including GHQ-12 (Uhrig, 2008).

[32] The whole sample of employed and self-employed workers consists of individuals who are present in any of the waves from 2001 and 2007, and declared to be employed or self-employed in the preceding year.

Table 4: Descriptive Statistics on the Individual-Level Variables

	Estimation Sample			Sample of Workers		
	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.
GHQ-12 - Overall	30.30	14.23	29405	29.94	14.20	47603
GHQ 12 - Anxiety and depression	31.05	20.06	29405	30.62	20.09	47603
GHQ 12 - Social dysfunction	34.19	12.70	29405	33.79	12.66	47603
GHQ 12 - Loss of confidence	17.15	20.62	29405	17.05	20.72	47603
Physical health	9.36	11.33	29405	8.36	10.98	51761
Age	43.71	11.30	29405	41.32	12.33	51758
Male	0.51	0.50	29405	0.52	0.50	51761
Higher degree	0.04	0.19	29405	0.04	0.20	47649
First degree	0.16	0.36	29405	0.15	0.36	47649
Teaching QF	0.03	0.16	29405	0.02	0.15	47649
Other higher QF	0.36	0.48	29405	0.32	0.47	47649
Nursing QF	0.01	0.09	29405	0.01	0.09	47649
GCE A levels	0.11	0.31	29405	0.12	0.33	47649
GCE O levels or equivalent	0.16	0.36	29405	0.17	0.38	47649
Commercial QF, no O levels	0.02	0.13	29405	0.02	0.13	47649
CSE grade 2-5, scot grade 4-5	0.03	0.17	29405	0.03	0.18	47649
Apprenticeship	0.01	0.09	29405	0.01	0.10	47649
Other QF	0.004	0.06	29405	0.01	0.07	47649
No QF	0.09	0.28	29405	0.10	0.30	47649
Married	0.64	0.48	29405	0.60	0.49	51725
Living as a couple	0.13	0.34	29405	0.14	0.35	51725
Widowed	0.01	0.12	29405	0.01	0.11	51725
Divorced	0.06	0.25	29405	0.05	0.23	51725
Separated	0.02	0.13	29405	0.02	0.14	51725
Never married	0.13	0.33	29405	0.17	0.38	51725
HH size	2.93	1.24	29405	3.02	1.28	51761
Single non-elderly	0.09	0.29	29405	0.08	0.28	51761
Single elderly	0.01	0.10	29405	0.01	0.09	51761
Couple, no children	0.29	0.45	29405	0.27	0.45	51761
Couple, dep. children	0.37	0.48	29405	0.38	0.48	51761
Couple, non-dep. children	0.15	0.35	29405	0.15	0.36	51761
Lone parent, dep. children	0.04	0.19	29405	0.04	0.20	51761
Lone parent, non-dep. children	0.03	0.18	29405	0.04	0.19	51761
2+ unrelated adults	0.01	0.10	29405	0.01	0.11	51761
Other households	0.01	0.11	29405	0.01	0.12	51761
Owned house or on mortgage	0.85	0.36	29405	0.83	0.37	50538
Shared house ownership	0.004	0.06	29405	0.004	0.07	50538
Rented house	0.13	0.34	29405	0.15	0.36	50538
Rent-free house	0.01	0.10	29405	0.01	0.10	50538
Other house types	0.003	0.06	29405	0.003	0.05	50538

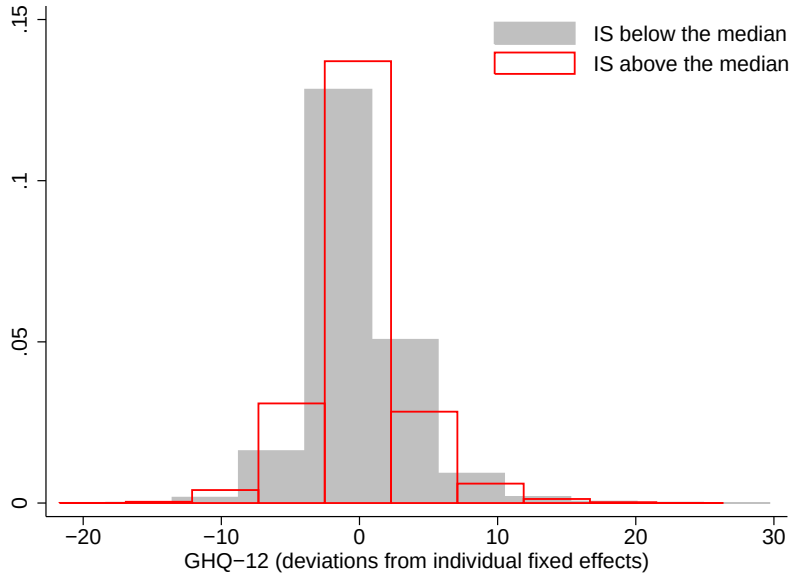
Notes. Source: British Household Panel Survey, 2001-2007. The whole sample of workers consists of individuals who were either employed or self-employed in the previous year.

mean (standard deviation) of the three components being equal to 31.1 (20.1), 34.2 (12.7), and 17.2 (20.6), respectively.

As for import competition, the average value of IS across the 119 industries in our sample is 0.204 log points, with a standard deviation of 0.308, which is almost identical to the difference between the industry at the 25th percentile of the distribution (0.059) and the industry at the 75th percentile (0.366). These figures indicate that the average competitive pressure from foreign countries has substantially intensified in the UK over the period of analysis. There is also significant variation across industries: some of them have received large shocks, with IS exceeding 0.50 log points on average (e.g., Manufacturing of TV and radios; Manufacturing of pharmaceutical products; Manufacturing of refined petroleum products); others have instead experienced a reduction in foreign competitive pressure, with the average value of IS being below -0.20 log points (e.g., Manufacturing of vegetable and animal oil; Production of steam generators).

Our import competition measure includes import flows into the UK from all countries in the world, thereby encompassing major exporters of both goods and services. To have a sense of the geographical composition of UK imports, the top-3 origin countries in 2007 were Germany, France, and the Netherlands for the manufacturing sector, and the US, Germany and Ireland for the service sector (WIOD). Over the sample period, the three countries with the largest increase in their share of total UK imports

Figure 2: Distribution of GHQ-12 by Industry Trade Exposure



Notes. The figure plots the distribution of GHQ-12 scores (deviated from individual fixed effects) across industries with *IS* below the sample median and above the sample median.

have been Slovakia, Czech Republic, and Hungary for manufacturing, and Romania, Poland, and India for services. The trends in the geographical composition of UK imports and, in particular, the rising role played by Eastern European countries, resemble the changes occurred in other industrialized European countries such as Germany (Dauth et al., 2014). The rising importance of India as an origin of service imports for the UK (and other developed countries) has been emphasized in previous papers, e.g., Amiti and Wei (2005). As for China, it occupied the fourth position in the 2007 ranking of import shares for the manufacturing sector and the eleventh position for the service sector; in terms of import share growth over the sample period, China occupies the fifth position in the ranking for manufacturing and the sixteenth position for services. For comparison, in the US, China was the second exporter in both sectors in 2007, and among the top-3 countries in terms of import share growth over the sample period, again in both sectors (WIOD).

Figure 2 provides preliminary, non-parametric, evidence on the relation between GHQ-12 and trade exposure. The figure plots the distribution of GHQ-12 scores (in deviations from individual fixed effects) across industries with *IS* below the sample median (full grey bars) and above the sample median (hollow red bars). The distribution of GHQ-12 in high trade exposure industries is shifted rightward compared to the distribution in other industries. This suggests that workers exposed to larger import shocks could have higher levels of mental distress compared to other workers. We now turn to regression analysis to identify and quantify the effect of import competition on individual mental distress.

5. Results

We organize the presentation of the empirical results in four sections. We start by providing evidence that import competition causes significantly higher levels of mental distress for the exposed workers (Section 5.1). Then, we study how these effects vary along the distribution of GHQ-12, and we analyze how they are perceived by different categories of workers within an industry (Section 5.2). We continue by studying whether and how the implications of trade exposure spill over to the members of a worker's

family (Section 5.3). Finally, we provide some evidence on the channels through which the effects of import shocks may take place (Section 5.4).

5.1. Import Competition and Individual Mental Distress

5.1.1. Baseline Estimates

The baseline estimates of eq. (2) are presented in Table 5. Panels a) and b) report the Two-Stage Least Square (2SLS) estimates (second and first stage, respectively); panel c) contains the OLS estimates; and panel d) shows the reduced-form estimates obtained by regressing GHQ-12 directly on the instrument (*WES Shock*). We rescale *IS* by its overall standard deviation, so that the coefficient β_1 measures the percentage point (p.p.) effect on GHQ-12 of a one standard deviation (s.d.) higher import shock. The standard errors are corrected for clustering by sector to allow for correlation in the error term across individuals employed in different 3-digit industries belonging to the same sector and over time.

In column (1), we start with a parsimonious specification controlling only for individual and year fixed effects. In the first-stage regression, the coefficient on the instrument has the expected positive sign and is very precisely estimated, with a point estimate of 0.186 (s.e. 0.006). This implies that a one s.d. increase in *WES Shock* is associated with a 0.19 s.d. increase in *IS*, pointing to the instrument being a strong predictor of UK import competition. Turning to the second stage, the coefficient β_1 is positive and highly statistically significant, with a point estimate of 1.01. This implies that a one s.d. higher *IS* leads to an increase in GHQ-12 of approximately 1 p.p..

In the following columns, we progressively add further controls until we reach our full specification as in eq. (2): we include sector×year fixed effects in column (2); the controls for pre-shock (i.e., at $t-6$) industry and individual characteristics in columns (3) and (4), respectively; occupation×year and LLM×year fixed effects in columns (5) and (6), respectively; and the dummies for month and hour of the interview in column (7). The coefficient β_1 remains positive, very precisely estimated, and largely stable in size across the board. Finally, in column (8), we report the results of estimating eq. (2) with observations weighted using the longitudinal survey weights provided in the BHPS. The number of observations is smaller than in the unweighted regressions because the weights are not available for all respondents.[33] Weighted and unweighted regressions yield very similar estimates of β_1, in line with the fact that the BHPS reproduces well both the industrial composition of the UK and important individual-level correlates of mental distress within industries, as shown in Section 2.1. If anything, the weighted coefficient is slightly larger, and thus less conservative, than the unweighted coefficient.[34] For this reason, and given that sample size is reduced when using weights, in the remainder of the paper we continue with unweighted regressions.[35]

Using the estimates from our preferred specification (column 7), we can quantify the effect of import shocks on individual mental distress. Given that GHQ-12 has an overall standard deviation of 14.2 and a within-individual standard deviation of 9.6, a coefficient β_1 equal to 1.15 implies that a one s.d. higher *IS* explains a sizable 12% (8%) of the within-individual (overall) standard deviation of GHQ-

[33] We employ the longitudinal weights named wLRWTSW1, which are available for the whole sample period (2001-2007) for the largest share of respondents. Following the indications of the BHPS User Manual, for each individual we take the weight from the last year employed in the analysis (2007) and use it for all years. Our findings are robust to using the alternative longitudinal weights available in BHPS. See Taylor et al. (2010) for more details regarding weights.

[34] In Appendix Table A2, we repeat all the specifications in Table 5 using the BHPS weights and find a similar pattern of results.

[35] Solon et al. (2015) argue that the similarity between weighted and unweighted regressions is consistent with sampling probabilities being independent of the error term in the regression equation. In the presence of exogenous sampling, the authors argue that weighted and unweighted regressions give consistent estimates of the parameters, but unweighted regressions are more precise.

Table 5: Baseline Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	a) 2SLS (second stage)							
IS	1.014***	1.154***	1.182***	1.357***	1.358***	1.172***	1.154***	1.334***
	[0.159]	[0.153]	[0.167]	[0.171]	[0.215]	[0.234]	[0.232]	[0.329]
R^2	0.55	0.55	0.55	0.55	0.55	0.58	0.58	0.56
Obs.	29405	29405	29405	29405	29405	29405	29405	22452
	b) 2SLS (first stage)							
WES Shock	0.186***	0.183***	0.172***	0.169***	0.151***	0.150***	0.149***	0.145***
	[0.006]	[0.008]	[0.008]	[0.007]	[0.005]	[0.005]	[0.005]	[0.007]
Kleibergen-Paap *F*-stat.	980.8	556.9	521.9	582.9	956.8	772.1	759.8	690.7
	c) OLS							
IS	0.184***	0.243***	0.267***	0.263***	0.265***	0.285***	0.290***	0.160***
	[0.061]	[0.020]	[0.018]	[0.019]	[0.021]	[0.025]	[0.024]	[0.050]
R^2	0.55	0.55	0.55	0.55	0.55	0.59	0.59	0.57
Obs.	29405	29405	29405	29405	29405	29405	29405	22452
	d) Reduced-Form (OLS)							
WES Shock	0.189***	0.211***	0.204***	0.229***	0.205***	0.176***	0.173***	0.193***
	[0.031]	[0.027]	[0.028]	[0.027]	[0.030]	[0.034]	[0.034]	[0.046]
R^2	0.55	0.55	0.55	0.55	0.55	0.59	0.59	0.57
Obs.	29405	29405	29405	29405	29405	29405	29405	22452
Individual FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓							
Sector×year FE		✓	✓	✓	✓	✓	✓	✓
Industry controls			✓	✓	✓	✓	✓	✓
Individual controls				✓	✓	✓	✓	✓
Occupation×year FE					✓	✓	✓	✓
LLM×year FE						✓	✓	✓
Interview FE							✓	✓
Weighted								✓

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. *IS* is the log change in real imports between $t-6$ and $t-1$, based on the industry in which the individual was employed at $t-1$ (see eq. 1); *IS* is rescaled by its overall sample standard deviation. *WES Shock* is defined as in eq. (3) and is based on the worker's pre-sample industry of employment; the US and Canada are excluded from the computation, both as origin and as destination of exports; *WES Shock* is rescaled by its overall sample standard deviation. *Sector×year FE* are fixed effects for each 2-digit manufacturing industry and for the service sector in each year. *Industry controls* include the sixth lag of real output, real value added, output price, employment share of high-skill workers, export intensity, and the share of workers employed in routine occupations. *Individual controls* include the sixth lag of: physical health, household size, and dummies for age, education level, marital status, self-employment, household type, and home ownership. *Occupation×year FE* are fixed effects for each major SOC occupational group in each year. *LLM×year FE* are fixed effects for each local labor market in each year. *Interview FE* include month and hour of interview fixed effects. The specifications in columns (1)-(7) are unweighted, whereas the specification in column (8) is weighted using the longitudinal weights provided by the BHPS. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

12. As a counterfactual, this effect is equivalent to what would be obtained by moving a worker from the industry at the 25th percentile of the distribution of *IS* to the industry at 75th percentile. To put our evidence in perspective, this effect is also comparable to that of a one s.d. higher crime rate across British local areas, as estimated by Dustmann and Fasani (2016).

To provide further evidence on the economic magnitude of the effect, we estimate the annual amount of money that would be necessary to compensate a worker for the higher mental distress caused by higher trade exposure. We start by mapping GHQ-12 scores into a health-based quality-of-life index, which can then be translated into monetary terms. We adopt the EQ-5D index, for which a mapping with GHQ-12 exists in the health literature (Serrano-Aguilar et al., 2009). This mapping is such that an increase in GHQ-12 translates into a lower EQ-5D score.[36] EQ-5D is normally used for computing

[36]The EQ-5D index refers to the health utility of an individual, assessed over five dimensions: mobility, pain and discomfort, self-care, anxiety and depression, and the ability to perform usual activities. Each of the five dimensions has three levels: no

quality-adjusted life years (QALY), which can be assigned a monetary value. In particular, one year of life in perfect health (i.e., a yearly EQ-5D equal to its maximum value of 1) corresponds to one QALY, which is conservatively estimated to be worth £30,000 by public health agencies in the UK (McCabe et al., 2008; Cornaglia et al., 2014).

With the EQ-5D index in hand, we replicate the 2SLS specification in column (7) of Table 5, using EQ-5D scores in place of GHQ-12 as the dependent variable. We obtain a coefficient of -0.009 (s.e. 0.002).[37] This indicates that an increase in import competition equal to the difference between the industries at the 25th and 75th percentiles of the distribution (or, equivalently, to one sample standard deviation) lowers EQ-5D by 0.9 p.p. in one year. The individual compensation for this loss would amount to £270 (i.e., 0.009×£30,000) per year. We can further use these numbers to perform a simple back-of-the-envelope calculation providing a rough sense of the total annual compensation required across all workers. A caveat of this calculation is that it necessarily abstracts from any aggregate (general equilibrium) benefit or cost that trade exposure may have across all workers, given that our empirical strategy identifies the relative effect of import competition across industries. With this caveat in mind, consider that the total number of employed people in the UK was equal to 29.4 million in 2007, and that the average import shock is equal to 0.204 log points (i.e., 66% of a standard deviation) in our sample. Then, a simple back-of-the-envelope calculation suggests that the total annual compensation would amount to roughly £5.2 billion (i.e., 0.66×270×29.4), approximately 0.35% of GDP, or 4.3% of total healthcare expenditure, in the UK in 2007.[38]

We perform an extensive sensitivity analysis to assess the robustness of the baseline 2SLS results. First, in Appendix Table A3, we estimate eq. (2) using alternative definitions of import competition. We redefine IS as the log change in: (1) imports over turnover; or (2) imports over domestic absorption. We also redefine IS as the absolute change in real imports normalized by initial $(t-6)$ absorption. Second, in Appendix Figure A2, we use alternative ways of clustering the standard errors and alternative definitions of the instrument. As for clustering, we: (1) use two-way clustering by sector and individuals, to also account for possible serial correlation in the error terms within individuals; and (2) use wild cluster bootstrap (Cameron et al., 2008) to account for the relatively moderate number of clusters. As for the instruments, we reconstruct the instrument in eq. (3) as follows: (1) as the weighted average of log changes in foreign countries' exports; (2) using time-invariant import shares at the beginning of the sample (i.e., in 1995); and (3) including the US and Canada among the set of origin and destination countries. Our results are robust across the board.

Going back to the baseline results, the bottom two panels of Table 5 provide OLS and reduced-form estimates for all specifications. These estimates are always positive and precisely estimated. In particular, the reduced-form coefficients confirm that GHQ-12 responds to shocks to UK trade exposure driven by foreign countries' export supply changes in the worker's pre-sample industry of employment. Moreover, a comparison between 2SLS and OLS estimates shows that the latter are downward biased. This is consistent with the fact that the instrument cleans the estimates from the potential confounding

problems, some problems, and major problems. Each combination of health states receives a different score (see euroqol.org for more information). In the algorithm by Serrano-Aguilar et al. (2009), each answer of the GHQ-12 questionnaire is associated with a coefficient. The EQ-5D index score is the sum of these coefficients after adjusting for sex and age. A situation of perfect health gets a score of 1, while less than perfect health gets lower (and even negative) scores.

[37] If we rescale the EQ-5D to range between 0 and 100 (like GHQ-12), we obtain a coefficient on IS equal to -0.639 (s.e. 0.154), which is approximately 45% lower (in absolute value) than the estimate of β_1 reported in column (7). This is consistent with EQ-5D encompassing a broader concept of health, which also includes dimensions of physical health (see footnote 36).

[38] The data on GDP used in this quantification come from the World Development Indicators, while the data on total number of employed people and total healthcare expenditure are sourced from the UK Office for National Statistics.

Table 6: Cross-Industry Sorting, Mental Distress, and Trade Exposure

	ΔIS (1)	ΔIS (2)	ΔIS (3)	$GHQ-12$ (4)	$GHQ-12$ (5)
Stayer	0.007				
	[0.012]				
$GHQ-12_{t-1}$		0.000	0.001		
		[0.001]	[0.001]		
IS				0.424***	1.005**
				[0.045]	[0.490]
Estimator	OLS	OLS	OLS	OLS	2SLS
R^2	0.00	0.00	0.00	0.65	0.65
Obs.	21108	10959	10149	15627	15627
Kleibergen-Paap *F*-Statistic					241.2
Sample	All	Stayers	Switchers	Stayers	Stayers

Notes. The regressions in columns (1)-(4) are estimated by OLS, the regression in column (5) by 2SLS. The dependent variables are indicated in the columns' headings. ΔIS is the year-to-year change in IS for each worker, based on her industries of employment at $t-1$ and t. *Stayer* is a dummy equal to one for workers who always remain in the same industry. $GHQ\text{-}12_{t-1}$ is the one-year lag of GHQ-12. Columns (1)-(3) do not include other regressors, whereas columns (4) and (5) include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for heteroskedasticity in columns (1)-(3) and for clustering at the sector level in columns (4) and (5). The first-stage coefficient on the instrument *WES Shock* in column (5) is 0.115 (s.e. 0.007). ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

effect of unobserved shocks within UK 3-digit industries, or worker cross-industry sorting based on mental distress and anticipated trade shocks.

We can shed light on the patterns and implications of worker sorting using the information on industry switching contained in our data. In a given year, approximately 20% of workers change industry, and 44% of individuals switch industry at least once over the sample period. We start by studying whether industry switching is correlated with changes in trade exposure. To this purpose, for each worker, we compute the year-to-year change in IS (ΔIS), based on her industries of employment at $t-1$ and t. For industry stayers, ΔIS only reflects variation in trade exposure within the same industry, whereas for industry switchers it captures the additional change due to the switch. In column (1) of Table 6, we regress ΔIS on a dummy equal to 1 for workers who always remain in the same industry ('stayers'). We find a small and not statistically significant coefficient, suggesting that a worker who switches industry does not experience a significantly different change in trade exposure compared to a worker who remains in the same industry. Next, we look for differential patterns of correlation between ΔIS and the $t-1$ level of GHQ-12, for stayers and switchers separately. Columns (2) and (3) show virtually no relation between the two variables for any group of workers. Taken together, this evidence points to industry switching being largely orthogonal to the interplay of mental distress and changes in trade exposure. Consistent with this conclusion, in column (4) we re-estimate the baseline specification (eq. 2) on the sub-sample of stayers, and find that the OLS estimate of β_1 is larger but not statistically different from the baseline estimate. If worker sorting was the main culprit for the downward bias of the OLS estimate, we would have expected a significant upward jump in the coefficient β_1 towards the 2SLS estimate when using the sub-sample of stayers. At the same time, column (5) shows that the 2SLS estimate of β_1 obtained on the sub-sample of stayers remains precisely estimated and virtually identical to the baseline 2SLS estimate reported in column (7) of Table 5.

Overall, the above analysis suggests that worker sorting across industries is unlikely to be the main driver of the downward bias in the OLS estimates. As previously discussed, this bias is then likely to reflect unobserved domestic shocks inducing a negative correlation between IS and GHQ-12 across 3-digit industries within sectors. For instance, a positive demand shock in the UK could induce an increase in realized imports in the country and simultaneously improve workers' subjective wellbeing

(i.e., reduce GHQ-12), thereby implying that the OLS estimate of β_1 understates the true impact of import competition on mental distress. A similar observation is also made in studies on the labor market implications of import competition, in which positive domestic demand shocks are argued to induce a downward bias in the OLS estimates of the effects of import competition on wages and employment (e.g., Autor et al., 2013, 2014).

5.1.2. Threats to Identification

In this section, we discuss the two main threats to identification related to our empirical strategy: correlated demand shocks and heterogeneous trends. As mentioned in Section 3, correlated demand shocks may influence both foreign countries' exports to the rest of the world and wellbeing in the UK, thereby violating the exclusion restriction. Yet, we now provide evidence that our results are unlikely to be driven by correlated shocks that may remain after controlling for all the covariates and fixed effects included in eq. (2). To this purpose, we study how the 2SLS estimates change when we reconstruct the instrument by excluding, from both the origin and the destination countries, different groups of economies (besides the US and Canada) whose shocks may be more likely to be correlated with those occurring in the UK. The results are reported in Table 7. In column (1), we drop all the members of the Commonwealth of Nations (CN), which are linked to the UK by past colonial ties and current economic cooperation. In column (2), we exclude all English-speaking countries, given that language similarity is an important determinant of bilateral relations. In column (3), we finally exclude all the members of the EU-15, which are highly economically integrated with the UK. The coefficient β_1 is either unchanged or if anything slightly larger than the baseline estimate. In Appendix Table A4, we also follow an approach similar to Autor et al. (2013) and Hummels et al. (2014), excluding groups of industries in which correlated shocks may be more likely to occur: (1) the industries with the highest correlation between their own output and UK GDP (all industries in sectors NACE 23, 25, 32, 62, and 64); (2) the most energy-intensive industries (all industries in sectors NACE 21, 23, 24, 26, and 27); and (3) the industries originally identified by Autor et al. (2013) as having experienced similar fluctuations across countries over the sample period, due to technological innovations, housing booms, and the rapid growth of emerging economies (all industries in sectors NACE 17, 18, 19, 26, 27, 28, and 30). We find that the coefficient β_1 is robust also across these alternative sub-samples.

Next, we use different strategies to control for industry-specific trends in mental distress. In column (4) of Table 7, we re-estimate eq. (2) adding interactions between year dummies and the average level of GHQ-12 (computed across all workers) in the individual's pre-sample industry of employment during the pre-sample period 1992-1994. These interactions soak up differences in trends across industries that start with initially distinct levels of mental distress across their workers. In column (5), we repeat the exercise but this time we interact year dummies with dummies for quartiles of the pre-sample distribution of average GHQ-12. In columns (6) and (7), we follow the same approach as in columns (4) and (5), but use the average change in GHQ-12 over 1992-1994, rather than the average level, to construct the interactions with the year dummies. These interactions control for the possible presence of heterogeneous trends across industries that are characterized by initially distinct dynamics in the mental distress of their workers. In column (8), we use an alternative strategy that consists of adding industry-specific linear trends to eq. (2). The estimate of β_1 remains positive and very precisely estimated. Finally, we ask whether our results may reflect a secular increase in mental distress rather than the specific effect of growing trade exposure. To this purpose, in column (9), we perform a placebo exercise, testing whether future import competition predicts past levels of mental distress. We focus on the BHPS waves between 1995 and 2000, and regress GHQ-12 scores at time t on IS computed as in eq. (1) between year t and

Table 7: Threats to Identification

	Excluding Countries			Pre-Trends					Placebo
	CN	English Speaking	EU-15	Av. GHQ	Av. GHQ (Quartiles)	Av. ΔGHQ	Av. ΔGHQ (Quartiles)	Linear	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2SLS (2nd stage)									
IS	1.172***	1.107***	1.742***	1.143***	1.129***	1.143***	2.460***	1.549***	
	[0.217]	[0.217]	[0.520]	[0.230]	[0.300]	[0.229]	[0.471]	[0.283]	
Future *IS*									0.026
									[0.172]
R^2	0.59	0.59	0.58	0.59	0.59	0.59	0.58	0.59	0.58
Obs.	29405	29405	29405	29402	29402	29384	29384	29405	22696
2SLS (1st stage)									
WES Shock	0.175***	0.188***	0.065***	0.152***	0.148***	0.149***	0.146***	0.124***	
	[0.008]	[0.008]	[0.004]	[0.006]	[0.005]	[0.006]	[0.007]	[0.007]	
Future *WES Shock*									0.177***
									[0.004]
Kleibergen-Paap *F*-Statistic	520.9	536.8	228.1	677.3	931.1	691.8	454.8	305	1708

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. Column (1) reconstructs the instrument *WES Shock* excluding the members of the Commonwealth of Nations (CN) from both the origin and the destination countries. Column (2) excludes all English-speaking countries. Column (3) excludes all the members of the EU15. Columns (4)-(8) control for differences in trends across industries: column (4) includes interactions between year dummies and the average pre-sample (over 1992-1994) value of GHQ-12 in each industry; column (5) does the same using dummies for quartiles of the pre-sample distribution of average GHQ-12; columns (6) and (7) perform the same exercises as in columns (4) and (5), using the average change in GHQ-12 in each industry over 1992-1994, rather than the average level of GHQ-12; and column (8) controls for industry-specific linear trends. Column (9) reports the results of a falsification exercise, in which GHQ-12 at time t is regressed on *IS* computed between t and $t+5$, using the BHPS waves for 1995-2000. All regressions include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

$t+5$; we reconstruct the instrument defined in eq. (3) accordingly. The coefficient β_1 drops to zero, which further suggests that our results are unlikely to reflect industry-specific trends that antedate the import shocks.

5.1.3. Alternative Sources of Variation

In this section, we exploit alternative sources of variation in UK imports to identify the effect of import competition on mental distress. In a first exercise, we restrict attention to specific groups of countries that are more likely to have experienced significant supply shocks over the sample period, due to either internal reforms that have boosted firm productivity, or technology-driven and policy-induced reductions in export costs. Compared to our main identification strategy, this approach reduces concerns with correlated demand shocks but may provide us with less explanatory power, given that it isolates specific aspects of import competition in the UK rather than the overall phenomenon.

With this caveat in mind, we select different groups of countries that, according to recent studies on the labor market effects of import competition, have undergone significant supply shocks over the last decades. In particular, following Autor et al. (2013) and subsequent papers by the same authors, we study the effects of imports from China, whose importance in world trade (especially of manufacturing goods) has rapidly increased due to improvements in domestic productivity and the 2001 accession to the WTO. Following Dauth et al. (2014), we also study the effects of imports from Eastern Europe and from the subset of ten Eastern European countries that joined the EU in 2004 and 2007 (henceforth EU10).[39] These countries have benefited both from the economic reforms that followed the fall of the

[39]The EU10 countries are: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia. Eastern Europe includes all EU10 countries plus Azerbaijan, Belarus, Georgia, Kazakhstan, Kirghizistan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

Iron Curtain and from the lower costs of exporting to the EU that resulted from the accession process. Finally, following Liu and Trefler (2018) and Amiti and Wei (2005), we concentrate on the effects of imports from India, a country that experienced rapid growth in exports, especially of business services, due to internal economic reforms and rapid improvements in communication technologies. These four groups of countries have not been equally important in the overall increase in UK imports over the sample period. As noted in Section 4, UK imports have grown more from Eastern Europe and India than from China. Moreover, imports from China have especially grown in the manufacturing sector, while imports from Eastern Europe and India have also substantially involved business services.

For each group of countries $g \in \{CHN,\ EE,\ EU10,\ IND\}$ and year t, we define the import shock as the log change in real imports from g between $t-6$ and $t-1$, based on the worker's industry of employment at $t-1$:

$$IS^{5,g}_{\psi(i,t-1),t} = \ln\left(Real\ imports^{UK\leftarrow g}_{\psi(i,t-1),t-1}\right) - \ln\left(Real\ imports^{UK\leftarrow g}_{\psi(i,t-1),t-6}\right). \tag{4}$$

Following the identification strategy pioneered by Autor et al. (2013) and used in other studies mentioned above (e.g., Dauth et al., 2014), we instrument UK imports from country group g using the group's exports to other developed economies. As a benchmark, we use the same eight countries selected by Autor et al. (2013): Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland. In particular, our instrument reads as follows:

$$EXP\ Shock^{5,g}_{\psi(i,0),t} = \ln\left(Real\ exports^{g\rightarrow Other}_{\psi(i,0),t-1}\right) - \ln\left(Real\ exports^{g\rightarrow Other}_{\psi(i,0),t-6}\right). \tag{5}$$

Unlike the main instrument in eq. (3), $EXP\ Shock^g$ is not conditioned on the pre-shock geographical composition of UK imports. This feature is important when analyzing imports from rapidly growing countries like the ones considered in this section. Indeed, for many of these countries, participation in world trade has increased rapidly over short periods of time, starting from very low initial levels. Hence, an instrument that conditions on the pre-shock shares of these countries in UK imports may capture only part of the increase in their exports caused by the supply shock. At the same time, not conditioning on pre-shock import shares raises the concern that unobserved time-varying shocks in the worker's pre-sample industry of employment could make $EXP\ Shock^g$ correlated with the error term in eq. (2), thereby violating the exclusion restriction. Hence, to account for this issue, we control for pre-sample sector$\times$year fixed effects, which absorb most time-varying confounds potentially correlated with $EXP\ Shock^g$.

The results of estimating eq. (2) using the import shocks IS^g and the instruments $EXP\ Shock^g$ are reported in columns (1)-(4) of Table 8. We do not rescale the variables IS^g by their standard deviation, so as to make the magnitude of the effects comparable across columns. The largest effects are found for the import shocks of Eastern Europe and EU10, followed by the import shock of India and by that of China (imprecisely estimated). This pattern is consistent with Eastern European countries having played a major role in the growth of UK imports over the sample period, followed by India especially in the service sector. The growth of Chinese exports has been less rapid and mostly concentrated in manufacturing, whose employment share in the UK is smaller than in other industrialized countries (e.g., the US) where the China shock had large consequences for the labor market.

In our second exercise, we follow a large empirical literature on import competition, and exploit exchange rate shocks for identification (see, e.g., Revenga, 1992; Bernard et al., 2006; Cuñat and Guadalupe, 2009). We gather data on exchange rates between the British pound and the national currencies of 46

Table 8: Alternative Sources of Variation

	Import Shocks by Country Group				Exchange Rates IV	
	Eastern Europe (1)	EU-10 (2)	India (3)	China (4)	Arithmetic (5)	Geometric (6)
2SLS (2nd stage)						
IS^{EE}	3.761*** [1.011]					
IS^{EU10}		1.219** [0.580]				
IS^{IND}			0.377** [0.156]			
IS^{CHN}				0.024 [0.132]		
IS					3.918*** [1.324]	1.826** [0.840]
R^2	0.59	0.59	0.58	0.63	0.57	0.59
Obs.	29121	29096	29405	21418	29405	29405
2SLS (1st stage)						
$EXP\ Shock^{EE}$	0.147*** [0.011]					
$EXP\ Shock^{EU10}$		0.284*** [0.026]				
$EXP\ Shock^{IND}$			0.176*** [0.016]			
$EXP\ Shock^{CHN}$				0.555*** [0.051]		
$ER\ Shock\ AM$					-0.129*** [0.016]	
$ER\ Shock\ GM$						-0.289*** [0.032]
Kleibergen-Paap F-Statistic	186.7	123.5	125.8	117.9	68.3	79.2

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. In columns (1)-(4), the explanatory variables are the log changes between $t-6$ and $t-1$ in UK real imports from a given country group (indicated in the columns' headings), based on the worker's industry of employment at $t-1$. In columns (5)-(6), the explanatory variable is the log change in total UK real imports (see eq. 1), rescaled by its overall sample standard deviation. *EXP Shock* denotes the log change in real exports between $t-6$ and $t-1$ from a given country group to Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland, based on the worker's pre-sample industry of employment. *ER Shock AM* and *ER Shock GM* are the changes between $t-6$ and $t-1$ in the arithmetic and geometric mean, respectively, of the exchange rates of 46 foreign countries with respect to the British pound, weighted by the countries' pre-shock shares in UK imports, based on the worker's pre-sample industry of employment. All regressions include the same controls and fixed effects as in column (7) of Table 5, and control for pre-sample sector dummies times year dummies. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

countries. Using these data, we construct an instrument for IS as the weighted average of these exchange rates, with countries' pre-shock shares in UK imports serving as weights. We use both a weighted arithmetic mean and a weighted geometric mean for robustness: the resulting instruments are labeled *ER Shock AM* and *ER Shock GM*, respectively.[40] The results are reported in columns (5) and (6) of Table 8. Even though the exchange rate shocks identify the coefficient β_1 on much fewer foreign countries than

[40]The data on exchange rates come from the International Financial Statistics database (IMF) and national sources. The two instruments are defined as follows:

$$ER\ Shock\ AM^{5}_{\psi(i,0),t} = \ln\left(\sum_c \mu_{c,\psi(i,0),t-6} \times ER_{c,t-1}\right) - \ln\left(\sum_c \mu_{c,\psi(i,0),t-6} \times ER_{c,t-6}\right)$$

for the weighted arithmetic mean, and

$$ER\ Shock\ GM^{5}_{\psi(i,0),t} = \exp\left(\frac{\sum_c \mu_{c,\psi(i,0),t-6} \times \ln ER_{c,t-1}}{\sum_c \mu_{c,\psi(i,0),t-6}}\right) - \exp\left(\frac{\sum_c \mu_{c,\psi(i,0),t-6} \times \ln ER_{c,t-6}}{\sum_c \mu_{c,\psi(i,0),t-6}}\right)$$

for the weighted geometric mean.

our preferred instrument, *WES Shock*, the results are qualitatively similar to the baseline estimates.[41]

5.1.4. Alternative Specifications

In this section, we address a number of possible issues related to our empirical specification. First, eq. (2) does not control for the individual's pre-shock level of mental health, to avoid the issues implied by the comparison of GHQ-12 over long time horizons (see the discussion in Section 2.2). Even though the individual fixed effects and our set of pre-shock individual controls capture most of the main economic and social determinants of mental distress highlighted in the literature, one may be concerned that we are still missing some relevant individual-level driver of mental health.[42] Second, the time structure used in eq. (2) involves multiple periods, as the specification relates GHQ-12 at time t to import growth between $t-6$ and $t-1$ and to pre-shock controls at $t-6$. A possible concern is that this time structure may influence our results, as import shocks for different years partially overlap with each other. Finally, one may be concerned that, by using five-year windows to construct IS, we are not fully isolating persistent import shocks that could be relevant for mental distress. We now modify the baseline specification in a number of ways to address these concerns. Then, we turn to a different empirical set-up and show that our baseline evidence holds also when estimating specifications in differences.

In columns (1) and (2) of Table 9, we control for the pre-shock ($t-6$) level of GHQ-12. In column (1), we use the raw variable, whereas in column (2) we add dummies for quartiles of its distribution. These dummies allow for more flexibility in the relation between past and current mental distress, compared to the linear relation that is imposed when using the continuous variable. The presence of some missing values in GHQ-12 prior to 2001 causes a moderate drop in the number of observations, but the coefficient β_1 is virtually identical to the baseline estimate in both columns. These results suggest that the inclusion of pre-shock levels of GHQ-12 does not bring further relevant information for the estimation of our main coefficient. In columns (3) and (4), we estimate eq. (2) using only GHQ-12 observations for the years 2001 and 2007. When we restrict the estimation to these two years, import shocks no longer overlap with each other: GHQ-12 in 2007 responds to IS computed over 2001-2006, and to pre-shock controls in 2001; GHQ-12 in 2001 responds instead to IS computed over 1995-2000, and to pre-shock controls in 1995. Column (3) reports the results for the baseline model (as in eq. (2)), whereas column (4) adds the dummies for quartiles of pre-shock GHQ-12. Despite the large drop in sample size, the coefficient β_1 remains positive, precisely estimated, and remarkably close in size to the baseline estimate. This shows that our main results continue to hold also in a set-up in which import shocks do not overlap. Finally, in columns (5) and (6), we use longer windows to construct IS. In column (5), we use a window of seven years. This specification uses observations on GHQ-12 for the period 2003-2007, allowing us to still include individual fixed effects in eq. (2). In column (6), we use instead the longest possible window, i.e., eleven years. This specification only uses observations on GHQ-12 for 2007, and thus corresponds to a cross-sectional regression.[43] The coefficient β_1 remains positive and highly statistically

[41] The identifying assumption underlying the use of exchange rates is that, conditional on all the covariates and fixed effects included in eq. (2), exchange rate shocks affect mental distress only through imports. In this respect, exchange rates are usually determined by aggregate macroeconomic conditions, and thus should not be significantly influenced by UK industry-specific shocks that could also affect mental distress. Exchange rates and mental distress could be co-determined by aggregate shocks, but the latter are absorbed by the sector×year fixed effects included in eq. (2). While exchange rates could influence mental distress also through exports, our evidence in Section 5.1.6 suggests that export shocks do not have significant effects on mental distress in the UK.

[42] We note that every individual observed at time t is also part of our sample at $t-6$, because we need to know the individual's pre-sample industry of employment to compute the relevant instrument.

[43] Accordingly, in this case we cannot include individual fixed effects. Moreover, all other fixed effects, i.e., for sectors, occupations, and LLM, obviously enter not interacted with time.

Table 9: Alternative Specifications

	Contr. for Past GHQ (1)	Contr. for Past GHQ (Quart.) (2)	Only Years 2001 & 2007 (3)	Only 2001 & 2007 Past GHQ (Quart.) (4)	Shock Length 7 Years (5)	Shock Length 11 Years (6)
2SLS (2nd stage)						
IS	1.122*** [0.210]	1.121*** [0.210]	1.187* [0.637]	1.065* [0.550]	5.728*** [1.807]	5.920*** [1.776]
R^2	0.60	0.60	0.88	0.89	0.61	0.07
Obs.	23467	23467	7136	7136	22135	4796
2SLS (1st stage)						
WES Shock	0.157*** [0.005]	0.157*** [0.005]	0.217*** [0.008]	0.217*** [0.008]	0.014*** [0.004]	0.065*** [0.010]
Kleibergen-Paap *F*-Statistic	836.3	843.8	716.1	806.4	15.6	43.0

Notes. The estimates presented in this table are obtained using different versions of the baseline specification presented in column (7) of Table 5. Column (1) controls for the pre-shock ($t-6$) level of GHQ-12. Column (2) adds dummies for quartiles of the pre-shock distribution of GHQ-12. Columns (3) only uses observations on GHQ-12 for two years, 2001 and 2007. Column (4) does the same and further adds dummies for quartiles of the pre-shock distribution of GHQ-12. Columns (5) and (6) reconstruct *IS* using seven-year or eleven-year windows, respectively. In all specifications, the dependent variable is GHQ-12, rescaled between 0 and 100. The specification in column (6) is estimated on the cross-section for the year 2007. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

significant in both columns. While the point estimates are larger than the baseline estimate, the use of different samples makes it hard to compare the magnitude of the coefficients. Nevertheless, this pattern is consistent with the idea that the use of longer windows is likely to capture more protracted trade shocks that could have a stronger effect on mental distress. At the same time, the increase in the point estimate could also reflect confounding factors operating over longer time horizons, as discussed in Section 2.3. In any case, the results suggest that by using a five-year window for the baseline definition of import shock we are capturing a lower bound of the effect of import competition on mental distress.

We now turn to a different empirical set-up and fit specifications in differences. In a similar spirit to Autor et al. (2013) and Acemoglu et al. (2016), the regression equation has the following form:

$$\Delta MD_{i,\tau} = \beta_1 \Delta \ln Real\ imports_{j,\tau} + \mathbf{I}_{i,0}\,\boldsymbol{\beta}_2^{'} + \mathbf{J}_{j,0}\,\boldsymbol{\beta}_3^{'} + \alpha_{s,\tau} + \alpha_{o,\tau} + \alpha_{l,\tau} + \alpha_m + \alpha_h + \varepsilon_{i,\tau}, \tag{6}$$

where $\Delta MD_{i,\tau}$ is the change in GHQ-12 for individual i over period τ; $\Delta \ln Real\ imports_{j,\tau}$ is the log change in real imports over period τ, based on the industry j in which the individual was employed at the beginning of period τ; $\mathbf{I}_{i,0}$ and $\mathbf{J}_{j,0}$ are start-of-period controls for individual and industry characteristics, including the same variables as in eq. (2); $\alpha_{s,\tau}$, $\alpha_{o,\tau}$, and $\alpha_{l,\tau}$ are sector, occupation, and LLM fixed effects specific to each period τ; α_m denotes dummies for the months of the two interviews taking place at the beginning and at the end of period τ; α_h does the same for the hours of the two interviews; and $\varepsilon_{i,\tau}$ is an error term. We instrument $\Delta \ln Real\ imports$ using the instrument $WES\ Shock$, computed as in eq. (3) by combining the geographical composition of UK imports at the beginning of each period τ with the change in foreign countries' world export supply over the period; as usual, the instrument is based on the worker's pre-sample industry of employment.

Our baseline estimates of eq. (6) use stacked first differences for two sub-periods (τ) of equal length, 1995-2001 and 2001-2007. For robustness, we also report results for sub-periods of different length, as well as for a cross-sectional version of eq. (6) estimated using a single difference for the entire period 1995-2007. To make the results comparable across specifications estimated on periods of different length, we use a consistent sample of individuals who were either employed or self-employed in 1995. In some

Table 10: Specification in Differences - 1995-2001 and 2001-2007

	Year FE (1)	Add. Sector FE (2)	Add. Indus. Charact. (3)	Add. Indiv. Charact. (4)	Add. Occ. FE (5)	Add. LLM FE (6)	Add. Interv. FE (7)	Add. Indiv. FE (8)
2SLS (2nd stage)								
$\Delta \ln$ *Real imports*	1.213***	1.045***	0.886***	0.785***	0.680**	0.747**	0.764**	1.059
	[0.207]	[0.166]	[0.189]	[0.180]	[0.257]	[0.277]	[0.281]	[0.662]
R^2	0.00	0.01	0.01	0.02	0.03	0.08	0.09	0.53
Obs.	6401	6401	6401	6401	6401	6401	6401	6401
2SLS (1st stage)								
WES Shock	0.299***	0.328***	0.337***	0.340***	0.307***	0.309***	0.308***	0.267***
	[0.030]	[0.009]	[0.008]	[0.009]	[0.006]	[0.006]	[0.006]	[0.013]
Kleibergen-Paap *F*-Statistic	99.8	1332.7	1642.9	1392.6	2942.9	2676.2	2630.5	423.4

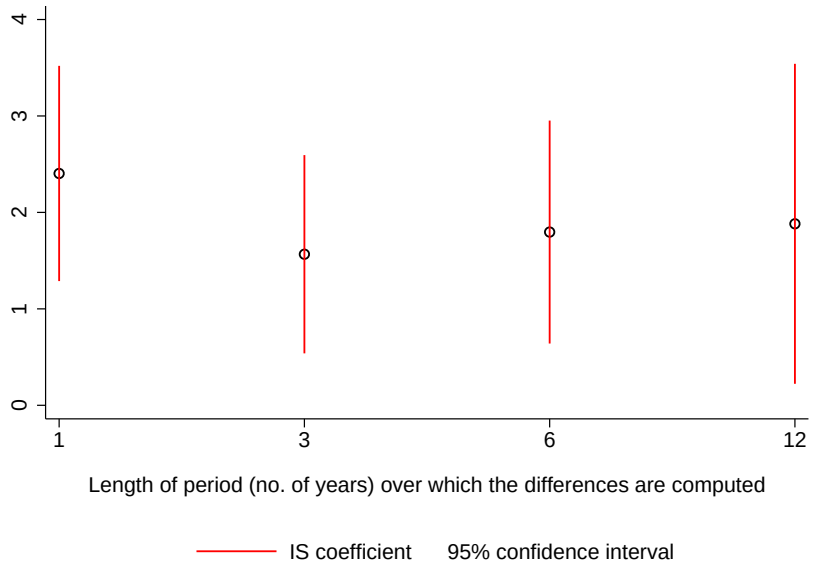
Notes. The table reports the estimates of eq. (6) using stacked first differences for two sub-periods, 1995-2001 and 2001-2007. The dependent variable is the change in GHQ-12 over each sub-period. $\Delta \ln$ *Real imports* is the log change in real imports over each sub-period, based on the worker's industry of employment at the beginning of the sub-period and rescaled by the overall sample standard deviation. The instrument *WES Shock* is computed as in eq. (3) by combining the geographical composition of UK imports at the beginning of each period with the change in foreign countries' world export supply over the period; the instrument is based on the worker's pre-sample industry of employment. The control variables and fixed effects included in each regression are listed in the corresponding column's heading. Individual and industry characteristics are start-of-period values of the variables used in Table 5. All regressions are estimated using a consistent sample of individuals who were either employed or self-employed in 1995. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

specifications, we also show results obtained by adding individual fixed effects (α_i) to eq. (6). While differencing removes time-invariant individual heterogeneity, these fixed effects absorb individual-specific linear trends in mental distress. It is worth noting that the baseline estimates of eq. (6) are based on a substantially smaller number of observations compared to the estimates obtained using eq. (2). The reason is that eq. (6) uses at most two data points per individual (i.e., one observation for 1995-2001 and one for 2001-2007). Moreover, the coefficient β_1 should be interpreted as the effect on a very specific sample of individuals, i.e., those who are observed in the first and last year of at least one sub-period.

The baseline estimates of eq. (6) are reported in Table 10. We rescale $\Delta \ln$ *Real imports* by its overall standard deviation and progressively add controls in the same order as in Table 5. In particular, column (1) contains a parsimonious specification including only year fixed effects (i.e., a dummy for the second sub-period). Column (2) adds sector$\times$year fixed effects; columns (3) and (4) further control for industry and individual characteristics; and columns (5)-(7) add the remaining fixed effects: occupation$\times$year fixed effects in column (5), LLM$\times$year fixed effects in column (6), and fixed effects for month and hour of the interviews in column (7). Despite the different specification, the smaller sample size, and the potential noise contained in the changes of GHQ-12, all estimates of β_1 are reassuringly positive and very precisely estimated, corroborating the qualitative message emerging from the baseline estimates. In column (8), we exploit the longitudinal dimension of the sample and re-estimate eq. (6) adding individual fixed effects. Contributing to identification are now individuals who are observed in both sub-periods and were working both in 1995 and in 2001. Moreover, the coefficient β_1 is now identified from deviations of both imports and GHQ-12 from a linear trend. With only two observations per individual, and with the large sets of fixed effects already included in eq. (6), this is an extremely demanding specification. Nevertheless, the coefficient β_1 remains in the same ballpark as (and, if anything, is slightly larger than) the estimates in previous columns, and it is only marginally insignificant, with a p-value of 0.12.

In Figure 3, we perform robustness checks on these estimates, using stacked differences of length equal to one, three, and six years. We also report results from estimating eq. (6) on a cross-section corresponding to a single difference for the whole twelve-year period 1995-2007. To make the estimates comparable across periods of different length, we annualize both ΔMD and $\Delta \ln$ *Real imports* in each

Figure 3: Specification in Differences - Periods of Varying Length



Notes. The figure plots the coefficients on $\Delta \ln$ *Real imports*, with the corresponding confidence intervals, obtained by estimating eq. (6) using stacked first differences for periods of varying length (indicated on the horizontal axis). The instrument for $\Delta \ln$ *Real imports* is *WES Shock*, computed as in eq. (3) by combining the geographical composition of UK imports at the beginning of each period with the change in foreign countries' world export supply over the period; the instrument is based on the worker's pre-sample industry of employment. Both ΔMD and $\Delta \ln$ *Real imports* are annualized in each specification. The confidence intervals refer to standard errors corrected for clustering at the sector level.

specification and control for all fixed effects included in eq. (6). The estimate of β_1 proves remarkably stable across all the specifications.

5.1.5. Dimensions of and Proxies for Mental Distress

We now extend the baseline analysis to consider alternative measures of mental distress and indirect proxies for it. First, we exploit the three components of GHQ-12 to study how import competition affects different dimensions of mental distress. Second, we draw from the BHPS information on a number of conditions and behaviors that could be related to mental distress, and study how these proxies react to trade exposure. Third, we build on the medicine literature to benchmark GHQ-12 against two clinically meaningful thresholds, and study how trade exposure affects the likelihood for individuals to be above them.

The results are reported in Table 11. In panel a), we re-estimate eq. (2) using each of the three components of GHQ-12 as the dependent variable: anxiety and depression in column (1), social dysfunction in column (2), and loss of confidence in column (3). We rescale each component to range between 0 and 100 for comparability. The coefficient β_1 is positive and highly significant in all columns, implying that trade exposure worsens all dimensions of mental distress, with the largest adjustment occurring in the form of a loss of confidence.

In panel b) we revisit, using our individual-level panel data, some of the evidence from contemporaneous studies based on regional data or repeated cross sections for the US (Adda and Fawaz, 2017; Lang et al., 2019; Pierce and Schott, 2019). To this purpose, we replace GHQ-12 with indirect proxies for mental distress. The first two variables are dummies for whether the individual exhibits clinical conditions related to anxiety, depression, and psychiatric problems (column 4), or to strokes (column 5). The next

Table 11: Measures of Mental Distress

	a) GHQ-12 Components			b) Conditions and Behaviors					c) GHQ-12 Thresholds		d) GHQ
	Anxiety & Depression (1)	Social Dysfunction (2)	Loss of Confidence (3)	Depression & Pychiatric Prob. (4)	Stroke (5)	Alcohol & Drugs (6)	Number of Cigarettes (7)	Heavy Smoker (8)	$GHQ \geq 12$ (9)	$GHQ \geq 19$ (10)	(11)
2SLS (2nd stage)											
IS	0.970***	1.034***	1.882***	0.012*	0.001	0.002***	0.225**	0.007**	0.023**	0.014***	0.814***
	[0.318]	[0.302]	[0.293]	[0.006]	[0.001]	[0.000]	[0.106]	[0.003]	[0.011]	[0.004]	[0.182]
R^2	0.62	0.49	0.64	0.59	0.42	0.57	0.90	0.75	0.52	0.45	0.58
Obs.	29405	29405	29405	29405	29405	29405	29182	29182	29405	29405	27320
2SLS (1st stage)											
WES Shock	0.149***	0.149***	0.149***	0.149***	0.149***	0.149***	0.150***	0.150***	0.149***	0.149***	0.155***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.006]
Kleibergen-Paap *F*-Statistic	759.9	759.9	759.9	759.9	759.9	759.9	757.8	757.8	759.9	759.9	796.8
Sample	All	All	All	All	All	All	All	All	All	All	$GHQ < 19$

Notes. The dependent variables are indicated in the columns' headings and are: the three components of GHQ-12 (each rescaled between 0 and 100) related to anxiety and depression (column 1), social dysfunction (column 2), and loss of confidence (column 3); dummies for whether the individual exhibits clinical conditions related to anxiety, depression, or psychiatric problems (column 4), strokes (column 5), or alcohol and drugs (column 6); the number of cigarettes smoked per day (column 7); a dummy for whether the individual smokes more than twenty cigarettes per day (column 8); dummies for whether GHQ-12 is greater than or equal to 12 (column 9) or 19 (column 10) on a 0-36 scale; and GHQ-12, rescaled between 0 and 100 (column 11). The regression in column (11) is estimated on the sub-sample of workers with GHQ-12 below 19 on a 0-36 scale. All regressions include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

three variables are related to health behavior, namely, a dummy for whether the individual has problems with alcohol and drugs (column 6), the number of cigarettes smoked per day (column 7), and a dummy for whether the individual is a heavy smoker consuming more than a twenty-cigarette pack per day (column 8).[44] The estimated coefficients are all positive and, with the exception of strokes, also statistically significant, implying that import shocks raise the probability that individuals suffer from anxiety and depression, as well as the likelihood that they abuse alchool, drugs and tobacco.

The variables used in panel b) capture mental distress only as long as it develops into a change in behavior or a clinical condition (and a particularly bad one in the case of strokes). On the contrary, the GHQ-12 measure allows capturing the entire spectrum of mental distress. As we now show, this is important because trade exposure significantly affects mental distress even if it does not manifest in a serious disorder.

We proceed by benchmarking GHQ-12 against two values that are often considered as critical thresholds in the medicine literature (e.g., Easton and Turner, 1991; Goldberg et al., 1997; Bradshaw et al., 1998). The first value is 12 (on the 0-36 scale), which is normally used by clinicians for screening purposes, as it signals a psychiatric disorder. The second value is 19, which is associated with an increased likelihood of suicidal ideation. For each threshold, we construct a dummy equal to 1 for individuals whose GHQ-12 is above the threshold. In columns (9) and (10), panel c), we re-estimate eq. (2) using each of these dummies as the dependent variable in place of GHQ-12. The coefficient on IS is positive and highly significant in both cases, implying that import competition shocks raise the probability that individuals develop a clinically relevant mental disorder or suicidal ideation. The latter result complements the cross-county evidence for the US, according to which trade exposed localities exhibit relatively higher rates of deaths or hospital admissions due to suicides (Adda and Fawaz, 2017; Lang et al., 2019; Pierce and Schott, 2019). Yet, column (11) shows that there is significant action also below this threshold. In particular, we re-estimate eq. (2) using GHQ-12 as the dependent variable, but restricting the sample to workers whose GHQ-12 is below the suicidal ideation threshold. The coefficient on IS is positive and very precise also on this sub-sample. The point estimate is quantitatively large, explaining approximately 70% of the baseline coefficient β_1. Hence, trade exposure increases mental distress also for workers whose mental conditions are not yet serious enough to develop into either clinical conditions or extreme changes in behavior that can be captured through indirect proxies such as suicides.

5.1.6. Export and Technology Shocks

In this section, we compare the effects of import competition with those of other shocks related either to alternative dimensions of trade integration or to technological progress. We start by considering the effects of export shocks. Recent papers based on individual-level data reach mixed conclusions regarding the implications of rising exports for wellbeing. On the one hand, exports may increase the scale of firms' operations, leading to greater worker effort and thus causing greater stress (Hummels et al., 2016). On the other hand, growing export opportunities may improve individuals' economic prospects (e.g., by raising wages as in Hummels et al., 2014), thereby leading to higher life satisfaction and wellbeing (Crozet et al., 2018).[45] These findings suggest that, to the extent that import competition and exports are correlated, our previous estimates may partly pick up the effects of export shocks. Moreover, given that export shocks may have distinct implications for individual wellbeing, it is interesting to study their

[44] The correlation between these variables and GHQ-12 is positive but not high. The correlation coefficient is 0.03 for the proxies related to strokes, alcohol and drugs, or smoking, and 0.3 for the proxy related to anxiety and depression.

[45] In developing countries, rising exports have also been shown to affect environmental quality, with important implications for infant mortality (Bombardini and Li, 2016).

effects separately from those of import competition, to see if they differ from each other.

To study the effects of export shocks using our individual-level data for the UK, we construct a new variable, ES, similar to our measure of import shocks, IS. In particular, following eq. (1), we define ES as the log change in real exports between $t-6$ and $t-1$ in the worker's industry of employment at $t-1$. The average value of ES across the 119 industries in our sample is 0.097 log points; compared with an average IS of 0.204 log points, this suggests that in the UK export shocks have on average been smaller than import shocks over the period of analysis. In a similar spirit to Hummels et al. (2014, 2016), we construct an instrument for ES that combines information on pre-shock shares of foreign countries in UK exports with changes in these countries' imports from the rest of the world. This instrument is meant to capture variation in UK exports driven by shocks to world import demand; accordingly, we label this variable $WID\ Shock$.[46]

The results are reported in Table 12. Compared to the baseline specification outlined in eq. (2), here we exclude the control for pre-shock export intensity, since exports at $t-6$ are part of the definition of ES. Similarly, we exclude the control for pre-shock routine shares, which are used to construct the technology shock as explained below. In column (1), we show that the coefficient on IS obtained from estimating eq. (2) without these two controls is virtually unchanged. In column (2), we study the effects of import competition and export shocks separately, by jointly including IS and ES in our specification.[47] The estimated coefficient on IS is unchanged, while the coefficient on ES is negative but not significant. Column (3) shows the effect of net import shocks, NES, defined as the difference between IS and ES, and instrumented using both $WES\ shock$ and $WID\ shock$. Consistent with the results in column (2), a positive shock to net imports significantly increases mental distress, and the coefficient on NES is virtually identical to the coefficient on IS.

Overall, the above results suggest that, while import competition significantly increases individuals' mental distress, export shocks do not cause significant changes in mental health for UK workers. In Appendix C.2, we report additional results using indirect proxies for mental distress in place of GHQ-12. These variables are selected to be as close as possible to the main proxies for worker mental health used by Hummels et al. (2016).[48] The results confirm our evidence based on GHQ-12, showing that export shocks have either insignificant or even mildly positive effects on mental health. In unreported regressions, we have also explored some potential reasons for this result, and found that export shocks are likely to improve workers' economic prospects by inducing an increase in wage growth.

We now turn to the effects of technology shocks. To the best of our knowledge, the implications of technical change for mental distress have not yet been investigated. While understanding these im-

[46] In particular, the instrument is constructed as follows:

$$WID\ Shock^{5}_{\psi(i,0),t} = \ln\left(\sum_{c}\eta_{c,\psi(i,0),t-6}\times WID_{c,\psi(i,0),t-1}\right) - \ln\left(\sum_{c}\eta_{c,\psi(i,0),t-6}\times WID_{c,\psi(i,0),t-6}\right),$$

where $\eta_{c,\psi(i,0),t-6} \equiv \frac{Exports_{c,\psi(i,0),t-6}}{Exports_{\psi(i,0),t-6}}$ is the share of foreign country c in total UK exports in industry $\psi(i,0)$ at time $t-6$, and $WID_{c,\psi(i,0),t-1}$ and $WID_{c,\psi(i,0),t-6}$ denote imports by country c from the world minus the UK in industry $\psi(i,0)$ for year $t-1$ and $t-6$, respectively. As for the instrument for import competition, we construct $WID\ Shock$ using data from BACII and WIOD, exclude the US and Canada from the set of foreign countries, and attach the instrument to each worker's pre-sample industry of employment.

[47] For specifications with more than one endogenous variable, we accompany the Kleibergen-Paap F-statistic with the minimum and maximum values of the F-statistics for excluded instruments from the first-stage regressions.

[48] Hummels et al. (2016) use information on expenses on anti-depressants and hospitalization due to strokes or self-harm. We capture depression using the dummy for whether the individual suffers from anxiety, depression, and psychiatric problems; the probability of suffering from hearth attacks using the dummy for strokes; and the risk of self-harm using the dummy for suicidal ideation.

Table 12: Export and Technology Shocks

	(1)	(2)	(3)	(4)	(5)
IS	1.067***	1.031***		0.940***	1.041**
	[0.228]	[0.169]		[0.192]	[0.481]
ES		-0.248			-0.301
		[0.859]			[1.742]
NIS			1.094***		
			[0.370]		
TS				-0.211	0.061
				[1.197]	[2.558]
R^2	0.59	0.59	0.58	0.59	0.59
Obs.	29405	29405	29405	29405	29405
F-Stat Excl. Instr. (min)		350.0		370.9	311.3
F-Stat Excl. Instr. (max)		800.0		1717.2	1717.2
Kleibergen-Paap *F*-Statistic	695.0	150.9	209.0	344.5	120.7

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. *ES* is a measure of export shocks; it is defined as the log change between $t-6$ and $t-1$ in real exports from the UK, based on the worker's industry of employment at $t-1$. *NIS* is a measure of net import shocks, constructed as the difference between *IS* and *ES*. *TS* is a measure of technology shocks; it is defined as the change between $t-6$ and $t-1$ in the share of workers employed in routine-intensive occupations, based on the worker's industry of employment at $t-1$. The instrument for *IS* is *WES Shock*, defined in eq. (3). The instrument for *ES* is *WID Shock*; it is defined analogously to *WES Shock*, combining information on pre-shock shares of foreign countries in UK exports with changes in these countries' imports from the rest of the world (see footnote 46). The instrument for *TS* is *TAC Shock*; it is defined as the product between the change in computer prices between $t-6$ and $t-1$ and the 1995 share of workers employed in routine-intensive occupations in each industry (see footnote 49). All instruments are based on the worker's pre-sample industry of employment. All regressions include the same controls and fixed effects as in column (7) of Table 5, except for the pre-shock values of export intensity and of the share of workers employed in routine-intensive occupations. For specifications with more than two endogeneous variables (columns 2, 4, and 5) the table also reports the minimum and maximum values of the *F*-statistics for excluded instruments from the first-stage regressions. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

plications in depth is beyond the scope of our paper, they are interesting and potentially not trivial. For instance, recent theories suggest that technical change may have different consequences for the labor market, with ambiguous overall effects (Acemoglu and Restrepo, 2018). To study how technology shocks affect mental distress, we construct a new variable, TS, defined as the change between $t-6$ and $t-1$ in the share of workers employed in routine-intensive occupations, based on the worker's industry of employment at $t-1$. The intuition is that routine occupations can be replaced more easily by computers and robots, so that technical change should be associated with a decrease in the employment share of routine occupations. The average value of TS across the 119 industries in our sample is -0.035 log points. We construct an instrument for TS by combining pre-sample information on industries' routine intensity with shocks to the cost of technology adoption. The idea is that exogenous declines in the cost of technology adoption should lead to more widespread technical change, especially in industries that are initially more intensive in routine occupations (see Autor and Dorn, 2013 for a similar argument in the case of local labor markets). We label this instrument *TAC Shock* to stand for *technology adoption cost* shock.[49]

The results are reported in column (4). The coefficient on TS is negative but imprecisely estimated, suggesting that technology shocks do not induce significant changes in the mental health of UK work-

[49]Specifically, the instrument is constructed as follows:

$$TAC\ Shock^{5}_{\psi(i,0),t} = RTIsh_{\psi(i,0),1995} \times (PCprice_{t-6} - PCprice_{t-1}),$$

where $RTIsh_{\psi(i,0),1995}$ is the share of workers employed in routine-intensive occupations in industry $\psi(i,0)$ in 1995 (see footnote 26), and $(PCprice_{t-6} - PCprice_{t-1})$ is the change in an index of computer prices (sourced from the Fred database of the S. Louis FED), which serves as a proxy for the change in average technology adoption costs.

ers. In unreported specifications, we have found suggestive evidence on some potential mechanisms underlying the insignificant effect of technology shocks, finding that these shocks improve workers' satisfaction with total pay while lowering satisfaction with job security. More importantly, the main coefficient on import competition remains positive and very precisely estimated. The same result obtains in column (5), which reports estimates from a specification that jointly includes IS, ES, and TS. Overall, the evidence reported in this section suggests that rising import competition has exerted larger negative effects on the mental health of UK workers over the sample period compared with other facets of structural change such as export and technology shocks.

5.2. Within-Industry Heterogeneity

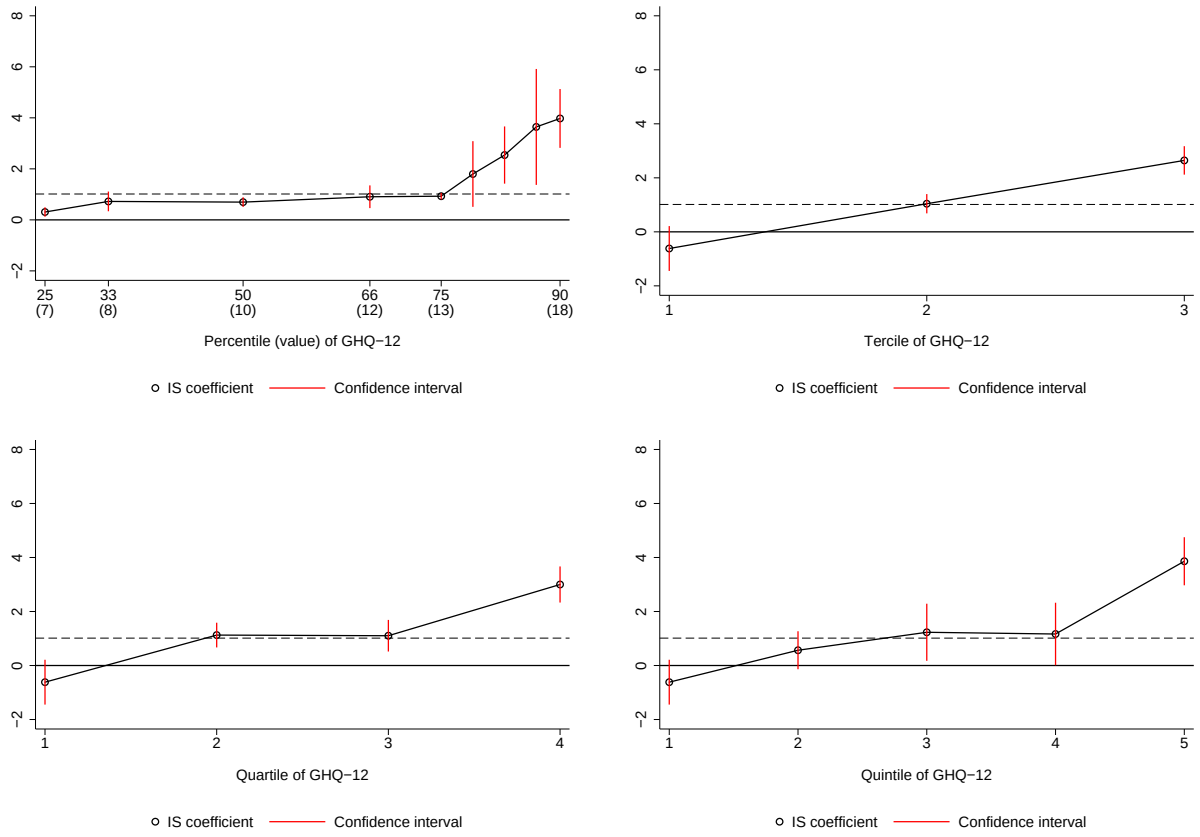
The previous section has analyzed the consequences of import competition for the average worker in an industry. The results show that the representative worker in a more trade exposed industry experiences higher mental distress compared to the representative worker in a less exposed industry. This implies that import competition contributes to increasing inequality in subjective wellbeing across industries. In this section, we investigate whether and how import competition influences inequality across workers also within the same industry.

To this purpose, we start by studying how the effects of import competition vary along the distribution of GHQ-12. In a first exercise, we employ a recent technique for the IV estimation of unconditional quantile treatment effects (Powell, 2016).[50] By modeling specific quantiles of the GHQ-12 distribution, quantile regressions allow us to study the effects of import shocks on different parts of the distribution, thereby providing information on how trade exposure affects the dispersion of mental distress within an industry. The results are depicted in Figure 4a (upper-left panel). We report the estimates of the coefficient β_1 for relevant percentiles of the GHQ-12 distribution, namely, the three quartiles (25th, 50th, and 75th percentile) and the two terciles (33rd and 66th). Moreover, to highlight the effects of trade exposure on the right tail of the distribution, we also show the estimates of β_1 for equally distant percentiles between the 75th and the 90th. The horizontal axis reports in parentheses the value of GHQ-12 corresponding to each relevant percentile. We find that the size of the effects of trade exposure monotonically increases along the distribution of GHQ-12, with a sharp acceleration in the right tail. In particular, the coefficient β_1 is as low as 0.308 (s.e. 0.113) at the bottom quartile of the distribution; then, it raises to approximately 1 (i.e., close to the level of the average effect, denoted by the dashed line) between the first tercile and the third quartile; finally, the coefficient sharply increases and almost quadruples between the third quartile (0.928, s.e. 0.079) and the 90th percentile (3.976, s.e. 0.701). These findings imply that the effects of import competition are not equally borne by all workers in an industry but are significantly stronger on the right tail of the mental distress distribution. Hence, trade exposure increases inequality in subjective wellbeing not only across industries but also across workers within an industry.

In a second exercise, we show the estimates of β_1 obtained by estimating eq. (2) separately on subsamples corresponding to equal-size bins of pre-shock $(t-6)$ levels of GHQ-12. This exercise nicely complements the previous evidence based on quantile regressions, in that it delivers the effect of trade exposure on the conditional mean of GHQ-12 within each bin, i.e., across individuals with initially different levels of mental distress. The results are reported in the remaining panels of Figure 4, with bins defined either as terciles (in panel b), quartiles (in panel c), or quintiles (in panel d) of the pre-shock

[50] This estimator solves the issue that the inclusion of fixed effects in standard quantile regression models alters the interpretation of the coefficient on the treatment variable. To ensure convergence, we apply this methodology to the parsimonious specification in column (1) of Table 5.

Figure 4: Effects of Trade Exposure along the Distribution of Mental Distress



Notes. The first graph (upper-left) plots the coefficients on *IS* obtained for different quantiles of the GHQ-12 distribution, by estimating the same specification as in column (1) of Table 5 by 2SLS quantile regressions. The other three graphs report the coefficients on *IS* obtained by separately estimating this specification on subsamples defined by terciles, quartiles, or quintiles of the pre-shock ($t-6$) distribution of GHQ-12. The dashed line corresponds to a value of 1.014, i.e., the coefficient on *IS* obtained on the whole sample (see column 1 of Table 5).

Table 13: Heterogeneity - Individual and Household Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
IS	1.080***	0.514*	1.188***	1.061***	1.741***	0.980***
	[0.251]	[0.254]	[0.205]	[0.289]	[0.319]	[0.330]
$IS \times male$	0.159					-0.114
	[0.308]					[0.331]
$IS \times age \leq 30$		3.644***				3.694***
		[0.609]				[0.545]
$IS \times low\ qualif.$			-0.094			-0.520
			[0.447]			[0.383]
$IS \times HH\,size = 1$				0.791		0.810
				[0.519]		[0.590]
$IS \times HH\,size \in [3,4]$				-0.205		0.183
				[0.479]		[0.473]
$IS \times HH\,size > 4$				2.359***		2.803***
				[0.367]		[0.391]
$IS \times good\ fin.\ cond.$					-1.797***	-1.729***
					[0.382]	[0.378]
R^2	0.59	0.58	0.59	0.58	0.58	0.57
Obs.	29405	29405	29405	29405	29402	29402
F-Stat Excl. Instr. (min)	321.7	84.0	115.1	135.3	322.7	111.0
F-Stat Excl. Instr. (max)	2064.5	1804.9	1238.7	348.1	628.1	1843.8
Kleibergen-Paap F-Statistic	501.2	42.0	222.7	118.3	362.3	8.2

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. In each column, IS is interacted with dummies for different individual and household characteristics (as indicated in the table) measured at time $t-6$. The linear terms of these characteristics, when not absorbed by the individual fixed effects, are included as well in the regressions but are not tabulated. The interaction between IS and a given characteristic is instrumented using the interaction between $WES\ Shock$ and that characteristic. All regressions include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

GHQ-12 distribution. Regardless of the definition of the bins, and in line with the evidence emerging from the quantile regressions, the results show a markedly increasing pattern in the effects of import shocks, with the coefficient β_1 being small and statistically insignificant at the bottom of the distribution, close to the average effect in the middle, and much larger at the top. These findings imply that an import shock has stronger negative consequences for mental health on individuals who are already more mentally distressed before the shock. This evidence is broadly consistent with findings from the psychology literature, according to which individuals with initially low levels of depression are more resilient to, or recover more quickly from, shocks affecting mental wellbeing (see, e.g., the literature review in Bonanno, 2008).

We now exploit the information on individual, household, occupational, and job characteristics contained in the BHPS to analyze how different groups of workers within an industry perceive the effects of import shocks. Specifically, in Table 13, we focus on individual and household attributes; in Table 14 we look at occupational characteristics; and in Table 15 we concentrate on job characteristics. In each table, we augment eq. (2) by adding interactions between IS and these characteristics.[51] Each characteristic is measured pre-shock (at $t-6$) to ensure that it is not itself influenced by the shock. We instrument each interaction using the interaction between the instrument $WES\ Shock$ and the corresponding characteristic.

Column (1) of Table 13 studies heterogeneity by gender, through the interaction between IS and a dummy equal to 1 for males. Column (2) explores heterogeneity by age, by adding the interaction between IS and a dummy for young workers (aged below 30). Column (3) looks at heterogeneity by educational level, by adding the interaction between IS and a dummy for workers with either low

[51] The linear terms of the characteristics that are not absorbed by the fixed effects included in eq. (2) are added as well to the augmented specifications. Their coefficients are not tabulated in Tables 13-15 in the interest of both space and readability.

Table 14: Heterogeneity - Occupational Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
IS	1.154***	1.103***	0.906***	0.712**	0.548*	0.575**
	[0.231]	[0.224]	[0.256]	[0.286]	[0.311]	[0.257]
$IS \times Self.empl.$	-0.103					0.004
	[0.440]					[0.456]
$IS \times Blue\ collar$		2.478***				2.587***
		[0.744]				[0.765]
$IS \times No\ decision\ making$			0.645**			
			[0.303]			
$IS \times No\ face\text{-}to\text{-}face$				0.660***		0.785***
				[0.161]		[0.150]
$IS \times No\ on\ site\ work$					1.235***	
					[0.297]	
R^2	0.59	0.59	0.59	0.59	0.59	0.58
Obs.	29405	29405	29405	29405	29405	29405
F-Stat Excl. Instr. (min)	517.8	219.4	2516.5	691.2	396.5	233.3
F-Stat Excl. Instr. (max)	1527.5	558.5	3014.5	2641.7	2963.8	2194.6
Kleibergen-Paap *F*-Statistic	558.7	227	538.7	466.2	363.3	235.1

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. In each column, *IS* is interacted with dummies for different occupational characteristics (as indicated in the table) measured at time $t-6$. The linear terms of these characteristics, when not absorbed by the individual fixed effects, are included as well in the regressions but are not tabulated. The interaction between *IS* and a given characteristic is instrumented using the interaction between *WES Shock* and that characteristic. All regressions include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

qualification degrees (UK levels 4 and 5) or no qualification. Column (4) studies the role of household size, by adding the interactions between *IS* and three dummies, equal to 1 for households composed of, respectively, a single person, three or four people (i.e., typically a couple plus one or two children), and more than four individuals; the excluded category is therefore households composed of two members. Column (5) considers the role of individuals' financial situation, by adding the interaction between *IS* and a dummy equal to 1 for individuals who report a financial condition allowing them to live comfortably. Finally, column (6) includes all these interactions jointly.

The results show that the effects of import competition are highly heterogeneous across individuals. In particular, trade exposure has substantially more detrimental effects on workers who are young, members of large households, and in financial distress. Taken together, these traits seem to point out that greater financial needs and a less stable financial situation tend to amplify the effects of import competition on mental distress. In this respect, younger people are known to be typically poorer and more budget constrained than older workers, and large households are often characterized by a less solid financial condition, associated with depressed savings and lower levels of per-capita consumption (see, e.g., Smith and Ward, 1980). According to the medicine literature, these features tend to make individuals more sensitive to economic shocks and to amplify the negative effects of these shocks on health-related measures (see, e.g., Wu et al., 2011). Consistent with these findings, our analysis in Section 5.4 indeed provides evidence that import competition acts on mental distress through a number of channels related to increased economic uncertainty and worsened economic prospects.

Table 14 looks at occupational characteristics. Column (1) explores heterogeneity between employed and self-employed workers, since the latter may have different characteristics (e.g., more freedom and control over their job; see, e.g., Dellot, 2014, and Tuttle and Garr, 2009) and perform jobs that may be less exposed to foreign competition. Consistent with this intuition, the coefficient on the interaction between *IS* and the dummy for self-employed workers is negative, albeit imprecisely estimated. In column (2), we investigate heterogeneity across occupations, by adding the interaction of *IS* with a dummy

Table 15: Heterogeneity - Job Characteristics

	(1)	(2)	(3)	(4)
IS	1.001***	1.051***	0.787**	0.930**
	[0.229]	[0.241]	[0.324]	[0.355]
IS × *Temporary*	2.087*			3.379***
	[1.101]			[1.211]
IS × *Part time*		-0.069		-0.423*
		[0.203]		[0.220]
IS × *Tenure* < 5 *years*			0.661**	0.466*
			[0.262]	[0.243]
R^2	0.59	0.59	0.60	0.60
Obs.	26344	26292	23662	23629
F-Stat Excl. Instr. (min)	43.6	3370.4	206.6	152.2
F-Stat Excl. Instr. (max)	2046.2	6860.1	3063.7	3638.1
Kleibergen-Paap *F*-Statistic	97.1	6941.0	124.2	174.3

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. In each column, *IS* is interacted with dummies for different job characteristics (as indicated in the table) measured at time $t-6$. The linear terms of these characteristics, when not absorbed by the individual fixed effects, are included as well in the regressions but are not tabulated. The interaction between *IS* and a given characteristic is instrumented using the interaction between *WES Shock* and that characteristic. All regressions are estimated on the sample of salaried workers, and include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for clustering at sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

for blue collar occupations.[52] Given that the UK is considered a skill-abundant country compared to its main trading partners, standard factor proportion arguments would suggest that blue-collar workers should suffer relatively more from trade shocks. In line with this, the coefficient on the interaction between *IS* and the dummy for blue-collar workers is positive, large, and highly statistically significant. As a robustness check, in column (3) we use an alternative measure of the skill-intensity of occupations. In particular, we define a dummy equal to one for occupations with little involvement in the decision-making process.[53] Also in this case, the interaction between *IS* and this dummy is positive and statistically significant.

Import shocks could also differentially affect workers across production stages, as long as imports involve intermediate inputs and thus reflect offshoring as well. Following previous empirical studies, we classify occupations as offshorable if their required degree of face-to-face interaction (Blinder, 2006) is below the median. In column (4), we interact *IS* with the offshorability dummy and find a positive and precisely estimated coefficient, implying that import shocks have larger effects on mental distress for workers performing more tradable jobs. Column (5) reports a robustness check on this result using an alternative offshorability measure, which exploits the index of no on-site work developed by Firpo et al. (2011).[54] The interaction between *IS* and this alternative offshorability dummy is also positive and statistically significant. Finally, column (6) includes the main interactions together, and confirms that the effects of import shocks are larger for workers in blue-collar and tradable occupations.

Finally, we turn to studying the role of job characteristics, namely, the type of contract and the length of job tenure. Since these characteristics are specific to salaried workers, in this part of the analysis we exclude self-employed workers from the sample. The results are reported in Table 15. Columns (1) and (2) look at the type of contract, by adding the interactions of *IS* with dummies for workers on temporary and part-time contracts, respectively. Column (3) explores the role of job tenure, by adding the interac-

[52] These are all occupations classified under the following codes of the SOC classification: 51-53, 55-59, 80-86, and 89-91.
[53] These are occupations for which the index of decision-making power sourced from Goos et al. (2009) is below the median.
[54] We source both tradability indexes from Goos et al. (2009).

tion of IS with a dummy equal to 1 if the worker has been with the same employer for less than five years. Finally, column (4) includes all these variables together. We find that, while import competition has no robust differential effect depending on the part-time vs. full-time nature of the contract, import competition raises mental distress significantly more for workers on temporary contracts or with a short job tenure. Both characteristics are typically associated with lower degrees of job and wage security (see, e.g., (Booth et al., 2002)). To summarize, the evidence in this section depicts a coherent picture, showing that import competition increases inequality in mental distress not only across industries but also across workers within industries. The reason is that trade exposure systematically batters individuals whose characteristics make them less resilient and more vulnerable to these shocks.

5.3. Intra-Family Spillovers

So far, we have investigated the consequences of import competition for the mental distress of directly exposed workers. In this section, we broaden the scope of the analysis, and study whether and how import competition affects the other members of the family of trade exposed workers. As mentioned in the introduction, a broad literature argues that different events faced by an individual may have both horizontal repercussions within the family (i.e., for the spouse) and inter-generational spillovers (i.e., to the children). In line with that, the fact that import competition affects workers' mental health suggests that trade exposure may also alter the family equilibrium, with indirect effects on the other members. No previous study has addressed this issue. Yet, a broad understanding of the implications of trade exposure for mental distress requires knowing whether these spillovers exist and the forms in which they manifest themselves. Indeed, knowledge of these potential externalities may be fundamental for the design and targeting of policy interventions.

The BHPS provides information on family ties, allowing us to identify, for each worker in our sample, all her family members living under the same roof, as well as the exact relationship through which each of them is linked to the worker. We begin our analysis by studying horizontal spillovers across spouses. Since the BHPS interviews all the adult members of each sampled household (aged 16 or more), we are able to measure mental distress, and to observe the industry of employment, for both spouses.[55] We augment our baseline specification in eq. (2) by including the import shock faced by the worker's spouse. We instrument the spouse's shock using the instrument $WES\ Shock$ in the spouse's pre-sample industry of employment. The sample used for this analysis consists of individuals: (i) who have a spouse, (ii) who were working at time $t-1$, and (iii) whose spouse was also working at $t-1$.

The results are reported in Table 16. As shown in column (1), the coefficient on the worker's own import shock is not statistically different from the baseline estimate of β_1 reported in Table 5. Hence, the augmented specification confirms our previous evidence that import competition raises mental distress for the exposed workers. At the same time, the coefficient on the spouse's import shock is imprecisely estimated, suggesting that there are no horizontal spillovers across spouses on average. A possible explanation for this result is that the import shocks of the two spouses are highly correlated, so that collinearity prevents us from separately identifying their coefficients. Yet, the two shocks are only weakly correlated in our sample (0.26), consistent with most individuals (78%) working in different industries from their spouses. Indeed, columns (2) and (3) show that the same pattern of results holds even when the two shocks are separately included in the specification.

A more interesting explanation for the lack of inter-spouse spillovers on average is that these spillovers exists but are heterogeneous across spouses. Indeed, a literature in sociology shows that males and fe-

[55] These could be either lawful spouses or cohabiting partners.

Table 16: Inter-Spouse Spillovers

	GHQ (1)	*GHQ* (2)	*GHQ* (3)	*GHQ* (4)	Satisfied HH Income (5)	Satisfied Partner (6)
IS (own)	0.889***	0.888***		0.782***	-0.064***	0.039
	[0.245]	[0.244]		[0.250]	[0.021]	[0.035]
IS (spouse)	0.017		0.025			
	[0.344]		[0.351]			
Female × *IS* (spouse)				0.751**	-0.077***	-0.148***
				[0.330]	[0.025]	[0.029]
Male × *IS* (spouse)				-0.422	0.004	-0.032
				[0.370]	[0.019]	[0.021]
R^2	0.65	0.65	0.65	0.65	0.68	0.73
Obs.	13169	13169	13169	13169	11574	11548
F-Stat Excl. Instr. (min)	518.0			613.0	199.4	200.7
F-Stat Excl. Instr. (max)	1058.9			1331.1	390.5	393.3
Kleibergen-Paap *F*-Statistic	825.7	1740.0	645.0	429.6	164.1	128.2

Notes. The dependent variables are indicated in the columns' headings and are: GHQ-12, rescaled between 0 and 100 (columns 1-4); a dummy for whether the individual is satisfied with household income (column 5); and a dummy for whether the individual is completely satisfied with the partner (column 6). *IS* (own) is the import shock of the worker, whereas *IS* (spouse) is the import shock of the worker's spouse or cohabiting partner. *Male* × *IS* (spouse) and *Female* × *IS* (spouse) are interactions between dummies for whether the individual is male or female and the import shock of the individual's spouse or cohabiting partner. The estimation sample consists of individuals (i) who have a spouse, (ii) who were working at time $t-1$, and (iii) whose partner was also employed (or self-employed) at $t-1$. All regressions include the same controls and fixed effects as in column (7) of Table 5. For specifications with more than two endogeneous variables (columns 1 and 4-6), the table also reports the minimum and maximum values of the *F*-statistics for excluded instruments from the first-stage regressions. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

males adjust differently to work-related shocks faced by their partners (see, e.g., Bolger et al., 1989). Motivated by this literature, we study whether inter-spouse spillovers differ by gender. To this purpose, we interact dummies for whether the individual is a male or a female with the spouse's import shock. We instrument each interaction with the corresponding interaction of *WES Shock*. The results are reported in column (4). The coefficient on the own import shock remains positive and precisely estimated. At the same time, the coefficient on the spouse's shock is statistically significant, and positive, only if the individual is a female. This result implies that horizontal spillovers across spouses exist but work in a precise direction, i.e., while women suffer from the import competition faced by their spouses, men do not.

A possible reason why women are more sensitive than men to the import shocks faced by their partners could be related to the contribution that male partners make to household income in the UK.[56] In particular, in our sample, males earn 43% more than their female spouses on average, and the wage differential between males and females is positive for 87% of the couples. Accordingly, the import competition faced by males may constitute a stronger threat to the household's overall financial situation, and thus have an impact also on the other family members. To investigate this explanation, we take advantage of a question in the BHPS asking individuals how satisfied they are with household income. We define a dummy equal to 1 for individuals who declare to be satisfied, and re-estimate the specification in column (4) using this dummy as the dependent variable. In line with the above discussion, in column (5), we find that the spouse's shock significantly reduces satisfaction with household income in the case of women but not for men.

A second insight for why horizontal spillovers across spouses could work from men to women is

[56] In our sample, 99.5% of couples are heterosexual couples. All the results on inter-spouse spillovers are unchanged when focusing only on heterosexual couples.

provided by the sociology literature, according to which work-related shocks tend to worsen the work-family balance, thereby reducing perceived marital quality especially for females (Bolger et al., 1989; Matthews et al., 1996). To explore this additional explanation, we exploit another BHPS question asking how satisfied an individual is with the partner. We construct a dummy equal to 1 if the individual is satisfied, and use this dummy as the dependent variable to re-estimate the specification in column (4). The results, reported in column (6), show indeed that the import competition faced by the spouse significantly reduces satisfaction with the partner for women, but not for men. Overall, these results suggest that the effects of trade exposure spill over from men to women within households, as the family equilibrium is put under strain by a combination of worsened economic conditions and marital harmony.

We now turn to discussing inter-generational spillovers. The BHPS complements the information on adults with information on all youths (aged 11-15) who are members of the sampled households. These youths are administered a different questionnaire, containing questions about time use, health behavior, self-esteem, and life satisfaction. These aspects have been shown to be related both to future health outcomes (e.g., Currie, 2009) and to the formation of skills—especially non-cognitive skills—that are good predictors of future labor market outcomes (e.g., Cunha and Heckman, 2007). We use these data to study how parental import competition affects children's wellbeing.

The number of children aged 11-15 who are sons or daughters of the adult individuals in our baseline sample is 1,315, corresponding to approximately 3,250 observations. Using this sample, we estimate the following specification by 2SLS:

$$y_{i,t} = \alpha_f + \alpha_c + \alpha_t + \beta_1 IS^5_{p,t} + \beta_2 Gender_i + \varepsilon_{i,t}, \tag{7}$$

where $y_{i,t}$ is an outcome for youth i in year t (details below); $IS^5_{p,t}$ is the import shock faced by parent p (either the mother or the father); α_f are household fixed effects; α_c are fixed effects for the youth's cohort; α_t are fixed effects for the year of the interview; $Gender_i$ is a dummy equal to 1 for male youths; and $\varepsilon_{i,t}$ is an error term. The inclusion of household fixed effects absorbs all time-invariant household characteristics that may affect a child's wellbeing. The coefficient of interest, β_1, is therefore identified from the remaining variation in outcomes across youths of the same age and gender, whose parents have been exposed to different import shocks. The standard errors are corrected for clustering by household to accommodate correlated shocks within households over time.

The results are reported in Table 17. Panel a) studies the effects of paternal import competition, whereas panel b) focuses on the effects of maternal trade exposure.[57] In columns (1) and (2), we look at parental investment in children. Our first proxy is a dummy equal to 1 if the youth declares that she watches more than 3 hours of television per day.[58] The second proxy is a dummy equal to 1 if the youth declares that she almost never talks to parents about things that are relevant for her. In column (3), we focus on health behavior, as proxied by a dummy equal to 1 for children who declare having already tried to smoke a cigarette. Columns (4) and (5) consider self-esteem, as proxied by two dummies equal to 1 if the youth declares that she feels useless or unhappy with her appearance, respectively. Finally, column (6) looks at life satisfaction, as proxied by a dummy equal to 1 for youths declaring to be completely unhappy with their life.

[57] The results are qualitatively unchanged when both import shocks are jointly included, although sample size almost halves because not all parents are employed at the same time, and youths from single-parent households drop from the sample.

[58] Long time spent in front of television has been shown to be associated with less resources allocated by parents to children (e.g., Cardoso et al., 2010); we use a threshold of three hours, as indicated by the pediatric literature.

Table 17: Intergenerational Spillovers

	Hours Watched TV (1)	Talk to Parents (2)	Tried Smoke (3)	Feel Useless (4)	Feel Unhappy Appearance (5)	Feel Unhappy Life (6)
	a) Paternal import competition					
2SLS (2nd stage)						
IS (*father*)	0.138**	0.152*	0.069	0.191**	0.139*	0.046**
	[0.063]	[0.079]	[0.058]	[0.093]	[0.079]	[0.022]
R^2	0.40	0.47	0.64	0.36	0.37	0.24
Obs.	3264	3237	3273	3268	3266	3268
2SLS (1st stage)						
WES Shock	0.172***	0.172***	0.168***	0.169***	0.172***	0.171***
	[0.028]	[0.028]	[0.028]	[0.029]	[0.028]	[0.028]
Kleibergen-Paap *F*-statistic	37.5	37.4	34.7	35.0	37.6	36.3
	b) Maternal import competition					
2SLS (2nd stage)						
IS (*mother*)	-0.060	0.060	0.022	-0.053	-0.078	-0.003
	[0.082]	[0.108]	[0.077]	[0.100]	[0.097]	[0.019]
R^2	0.42	0.49	0.64	0.38	0.40	0.37
Obs.	3479	3312	3490	3480	3488	3492
2SLS (1st stage)						
WES Shock	0.123***	0.128***	0.123***	0.124***	0.124***	0.122***
	[0.027]	[0.029]	[0.027]	[0.027]	[0.027]	[0.027]
Kleibergen-Paap *F*-statistic	20.0	19.9	20.2	20.4	20.6	19.9

Notes. The sample used in this table consists of children aged 11-15 who are sons or daughters of the adult individuals belonging to the baseline sample used in previous tables. The dependent variables are indicated in the columns' headings and are: a dummy equal to 1 if the youth declares watching more than 3 hours of television per day (column 1); a dummy equal to 1 if the youth declares that she almost never talks to parents about things that are relevant for her (column 2); a dummy equal to 1 for children who declare having already tried to smoke a cigarette (column 3); a dummy equal to 1 if the youth declares that she feels useless (column 4); a dummy equal to 1 if the youth declares that she is unhappy with her appearance (column 5); and a dummy equal to 1 if the youth declares to be completely unhappy with her life (column 6). *IS* (father) denotes the import shocks faced by the father; *IS* (mother) denotes the import shocks faced by the mother. All regressions include: household fixed effects; cohort fixed effects; year of the interview fixed effects; and a gender dummy. The standard errors are corrected for clustering at the household level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

The results depict a coherent picture, according to which the import competition faced by the father has negative spillovers on the youths. In particular, paternal trade exposure leads to a reduction in the resources invested by the family in the children, to a worsening of the youth's self-esteem, and to a decline in life satisfaction. On the contrary, we find imprecisely estimated coefficients on the import shock faced by the mother. This pattern of results is consistent with our previous evidence on horizontal spillovers across spouses, and points to the fact that changes in family equilibrium and economic conditions induced by paternal trade exposure have repercussions not only for spouses but also for the offspring.[59]

Overall, the results of this section suggest that the impact of trade exposure on mental distress is not limited to trade exposed workers but extends to their households. In particular, women experience increased mental distress as a consequence of their spouses' import shock, and the weakest members of the family (i.e., the youths) face a worsening of various conditions that are important for their later development.

[59]This pattern is also broadly consistent with evidence from recent empirical studies, according to which paternal work-related shocks tend to have stronger effects on child development than maternal shocks (Kuhn et al., 2009; Rege et al., 2011; Lindo et al., 2018).

5.4. Channels

In this final section, we provide evidence on a number of micro-level channels through which import competition may affect individuals' mental wellbeing. To this purpose, we study how import shocks affect various economic correlates of mental distress. We proceed in two steps. First, we explore the correlation between GHQ-12 and each of these channel variables, by means of OLS regressions of the following form:

$$\begin{aligned} MD_{i,t} =& \alpha_1 C_{i,t} + \mathbf{I}_{i,t-6}\, \boldsymbol{\alpha}_2^{'} + \mathbf{J}_{\psi(i,t-1),t-6}\, \boldsymbol{\alpha}_3^{'} + \\ &+ \alpha_i + \alpha_{\sigma(i,t-1),t} + \alpha_{\omega(i,t-1),t} + \alpha_{\lambda(i,t-1),t} + \alpha_m + \alpha_h + \varepsilon_{i,t}\ , \end{aligned} \tag{8}$$

where $C_{i,t}$ is a proxy for a specific channel (details below) measured for individual i in year t, and the other variables are defined as in the baseline specification, eq. (2). Then, we study how import competition affects each channel C, by running 2SLS regressions of the following form:

$$\begin{aligned} C_{i,t} =& \beta_1 IS^5_{\psi(i,t-1),t} + \mathbf{I}_{i,t-6}\, \boldsymbol{\beta}_2^{'} + \mathbf{J}_{\psi(i,t-1),t-6}\, \boldsymbol{\beta}_3^{'} + \\ &+ \alpha_i + \alpha_{\sigma(i,t-1),t} + \alpha_{\omega(i,t-1),t} + \alpha_{\lambda(i,t-1),t} + \alpha_m + \alpha_h + \varepsilon_{i,t}\ , \end{aligned} \tag{9}$$

where we instrument IS using *WES Shock* as in the previous sections.

The coefficients α_1 from eq. (8) are not causal estimates but simple correlations. The reason is that each channel C could either respond to the individual's mental distress or be simultaneously determined with it by some unobserved third factor. Because import competition potentially affects more than one channel according to eq. (9), import competition does not provide enough distinct sources of variation for identifying the causal effects of each channel on mental distress. On the contrary, under the exclusion restriction that *WES Shock* affects each channel C only through IS, each coefficient β_1 estimated from eq. (9) can be interpreted as the causal effect of import competition on the corresponding channel.

The estimates of eq. (8) are reported in panel a) of Table 18. In columns (1)-(4), we estimate eq. (8) using proxies for four different channels; in column (5), we include all these variables jointly for completeness. The estimates of eq. (9) are reported in panel b) of Table 18, with each column using the proxy for the corresponding channel as the dependent variable.

As a first mechanism, we analyze the role of job displacement, given that job losses are typically associated with an increase in mental distress. Specifically, in column (1), panel a), we estimate eq. (8) with the main explanatory variable, C, being a dummy equal to 1 if a worker switches out of employment in a given year. The results show that switching out of employment is strongly positively correlated with mental distress in our data. In panel b), we estimate eq. (9) using the dummy for switching out of employment as the dependent variable. We find a positive and statistically significant coefficient on IS, implying that trade exposure raises the probability of leaving employment in the UK. Overall, these results jointly suggest that a first mechanism through which import competition may affect individuals' mental distress is by increasing the risk of job displacement.

Next, we provide evidence that the effects of trade exposure are not contained to displaced individuals, but extend to the wider population of workers. One channel through which this may happen is related to wage changes. In column (2), panel a), we estimate eq. (8) with the explanatory variable, C, being the yearly percentage change in each worker's gross wage.[60] We find wage growth to be strongly

[60] Since wage growth and the proxies for the other channels considered in the subsequent columns can be computed only for currently working individuals, from now on we restrict the sample to workers who do not switch out of employment in a given

Table 18: Channels

	(1)	(2)	(3)	(4)	(5)
	a) Correlates of Mental Distress (Dep. Var.: GHQ-12; Estimator: OLS)				
Switch out empl.	2.406***				
	[0.341]				
Wage growth		-0.643***			-0.446***
		[0.096]			[0.097]
Job sat. (overall)			-4.404***		-4.423***
			[0.079]		[0.081]
Expect. (promotion)				-0.626***	-0.406**
				[0.171]	[0.162]
R^2	0.59	0.59	0.60	0.60	0.61
Obs.	29405	23300	23292	22262	22262
	b) Trade Exposure and Correlates of Mental Distress				
	Switch out Empl.	Wage Growth	Job Sat. (Overall)	Expect. (Promotion)	
2SLS (2nd stage)					
IS	0.018***	-0.020***	-0.029***	-0.029***	
	[0.007]	[0.006]	[0.006]	[0.010]	
R^2	0.50	0.26	0.56	0.53	
Obs.	29405	23300	23292	22262	
2SLS (1st stage)					
WES Shock	0.149***	0.161***	0.161***	0.162***	
	[0.005]	[0.004]	[0.004]	[0.004]	
Kleibergen-Paap *F*-Statistic	759.9	1747.0	1749.0	2130.0	

Notes. In panel a), the dependent variable is GHQ-12, rescaled between 0 and 100, and the regressions are estimated by OLS. In panel b), the dependent variables are indicated in the columns' headings, and the regressions are estimated by 2SLS. *Switch out empl.* is a dummy equal to 1 if a worker switches out of employment in a given year. *Wage growth* is the yearly percentage change in each worker's gross wage. *Job sat.* (overall) is a dummy equal to 1 if the individual declares to be satisfied with her job. *Expect.* (promotion) is a dummy equal to 1 if the individual wishes to obtain a better job with the current employer over the next year, and expects this to actually happen. The regression in column (1) is estimated on the whole sample of workers; the other regressions are estimated on the sample of workers who do not switch out of employment in a given year. All regressions include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

negatively correlated with mental distress. In panel b), we estimate eq. (9) using wage growth as the dependent variable. The coefficient on IS is negative and highly statistically significant, implying that a one s.d. increase in IS reduces wage growth by 2%. Taken together, these results suggest that import competition may raise the mental distress of non-displaced workers by flattening their wage profile.

Next, we turn to channels that are not captured by standard labor market outcomes such as job status and wage growth. These channels may be relevant also for workers who experience no change in their observable labor market conditions, and thus are usually thought to be sheltered from the effects of globalization. One channel is related to job satisfaction. In column (3), panel a), we estimate eq. (8) with the explanatory variable, C, being a dummy equal to 1 if the individual declares to be satisfied with her job. The results show that individuals who are not satisfied with their job are significantly more distressed. In panel b), we estimate eq. (9) using the job satisfaction dummy as the dependent variable. We find that import shocks reduce the probability that an employed worker declares to be satisfied with her job.

In Appendix C.1, we probe deeper into the reasons why import competition reduces job satisfaction. To this purpose, we estimate eq. (8) and (9) with the variable C capturing four distinct determinants of

year.

job satisfaction: total pay, job security, workload (hours worked), and the content of the job. We find that all these dimensions of job satisfaction are negatively correlated with GHQ-12. Moreover, we find that import competition leads to a deterioration in all dimensions of job satisfaction, with significant coefficients in the case of job security, workload, and the content of the job itself (Table A5).[61] Overall, this evidence suggests that import competition makes non-displaced workers perceive their jobs as becoming more unstable and demanding, as if firms passed on to their employees part of the increased competitive pressure from trade.

The last channel we consider is related to expectations about the future. To study this channel, we use the information contained in the BHPS and construct a new variable capturing expectations about job promotion. This variable is a dummy for whether the individual wishes to obtain a better job with the current employer over the next year, and expects this to actually happen.[62] In column (4), panel a), we estimate eq. (8) using this variable, and find better expectations to be associated with lower mental distress. In panel b), we estimate eq. (9) and obtain a negative and significant coefficient on IS, implying that import competition worsens expectations about job promotion.[63]

Overall, the analysis in this section suggests that import competition may worsen individuals' mental health through four channels. Two of them work through relatively standard labor market mechanisms, whereby trade exposure raises the probability of job displacement and reduces wage growth for non-displaced workers. In this respect, our results suggest that import competition induces additional distributional effects compared to the traditional trade-related adjustment costs, as affected workers bear not only the pecuniary losses entailed by unemployment spells and lower wage growth, but also further costs in terms of reduced mental wellbeing. The other two channels—working through job satisfaction and expectations—are less well understood and perhaps more interesting, as they may also be at play for a broad population of workers with unchanged labor market outcomes. Taken together, our findings suggest that import competition may induce distributional effects that are more pervasive than thought until now.

6. Conclusion

We have studied the effects of import competition on individual mental distress, using unique longitudinal data on mental health for British residents, coupled with measures of import competition in more than 100 industries over 1995-2007. We have found that trade exposure has large negative effects on mental health. We have quantified that a worker employed in the industry at the 75th percentile of the distribution by trade exposure would need a monetary compensation of approximately £270 per year to make up for her greater utility loss relative to a similar worker employed in the industry at the 25th percentile of the distribution. We have found that the effects of import competition are systematically stronger on the right tail of the mental distress distribution. Using detailed data on demographic, occupational, and job characteristics, we have also found that trade exposure especially batters specific groups of individuals, such as those who are young, have large families, are in bad financial conditions,

[61] In untabulated regressions, we have used the information on the total number of hours worked reported in the BHPS to shed more light on the role of workload. Previous studies find that the number of hours worked is negatively associated with job satisfaction (Chongvilaivan and Powdthavee, 2014). Indeed, we find that import competition leads to a significant increase in the number of hours worked (coefficient 0.008, s.e. 0.003), confirming that trade exposure induces firms to switch to longer and more demanding working schedules.

[62] Böckerman and Maliranta (2013) use a similar measure of expectations in a study on outsourcing in the context of Finland.

[63] In Appendix C.1, we use another variable that captures expectations about the individual's future financial condition. In line with the results of this section, we find that import competition also worsens expectations about the future financial situation of the worker (Table A5).

are employed in blue-collar or tradable occupations, have a short job tenure or are on temporary contracts. Exploiting unique information on family ties, we have also studied how the effects of import competition spill over to other members of a worker's family. We have found that women's mental distress increases as a consequence of the import competition faced their partners. Moreover, paternal import competition leads to a significant reduction in parental investment in child rearing, and to a worsening of children's self-esteem and life satisfaction. Finally, we have provided evidence that the effects of import competition are likely to work through a complex set of channels, which include job displacement and lower wage growth, but also channels that are not related to the observable labor market conditions of a worker, such as reduced job satisfaction and worsened expectations about the future.

While globalization generally induces aggregate welfare gains, our results suggest that its distributional consequences are possibly stronger and more pervasive than usually thought. From a policy perspective, our results point to the need of accompanying trade liberalization with policies aimed at strengthening public mental health services and subsidizing trade exposed workers for their utilization. These services should especially be made accessible to the weakest individuals, who bear the bulk of the effects of trade exposure, and extended to the family members of trade exposed workers, including their children. Studying the optimal size and design of these interventions seems a promising area for future research.

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Appendix - Not for Publication

A. Additional Data Description

In this Appendix, we provide additional information on our main data source, the British Household Panel Survey. To start with, in Table A1, we compare the BHPS with the 2001 UK Census in terms of important correlates of mental distress. For each variable, we show its average computed across all employed and self-employed workers in the industry listed in the first column of the table. We consider fifteen NACE Rev. 1.1 industries, the highest level of industry disaggregation allowed for by the UK Census. Strikingly, the BHPS reproduces remarkably well the characteristics of the fifteen Census industries in terms of the prevalence of important correlates of mental health.

Next, we provide additional descriptive statistics on our main measure of mental distress, the GHQ-12. To this purpose, in Figure A1, we plot the coefficients obtained by regressing GHQ-12 on dummies for eleven age bins (indicated on the horizontal axis), plus individual and year fixed effects, using the whole sample of workers in the BHPS. The results show that the life cycle profile of workers' mental distress is concave: relative to the excluded group of individuals in the 16-20 age group, mental distress steadily increases and remains significantly higher until age 50. Then, mental distress constantly declines and reverts to the level of the reference group.

B. Additional Robustness Checks

In this Appendix, we report additional robustness checks on the baseline estimates presented in Table 5.

B.1. Weighted Regressions

In Table A2, we show the results obtained from weighted regressions, for all specifications reported in Table 5. We use the same weights employed in column 8 of Table 5. The main patterns are robust across the board, and the weighted estimates are always close to the unweighted estimates. The similarity between weighted and unweighted results is consistent with the fact that the BHPS reproduces well both the industrial composition of employment in the UK and the characteristics of individual industries in terms of important correlates of mental distress (see Section 2.1 and Appendix A).

B.2. Definitions of Import Shock and Threats to Identification

In Table A3, we use alternative definitions of the import shock. In column (1), we estimate eq. (2) using a measure of import shock constructed as in eq. (1) but using the ratio of imports over turnover in place of real imports. In column (2), we do the same, but we use the ratio of imports over domestic absorption (i.e., production plus imports minus exports) in place of real imports to construct the import shock as in eq. (1). In column (3), we finally define the import shock as follows:

$$IS^{5}_{\psi(i,t-1),t} = \frac{\left(Real\ imports_{\psi(i,t-1),t-1}\right) - \left(Real\ imports_{\psi(i,t-1),t-6}\right)}{Absorption_{\psi(i,t-1),t-6}}$$

and similarly redefine the instrument as

$$WES\ Shock^{5}_{\psi(i,0),t} = \frac{\left(\sum_c \mu_{c,\psi(i,0),t-6} \times WES_{c,\psi(i,0),t-1}\right) - \left(\sum_c \mu_{c,\psi(i,0),t-6} \times WES_{c,\psi(i,0),t-6}\right)}{Absorption_{\psi(i,0),t-6}}$$

where, as usual, $\psi(i,0)$ denotes the worker's pre-sample industry of employment. The results are qualitatively unchanged across the three alternative definitions of import competition.

In Table A4, we study how the baseline estimates change when we exclude groups of industries in which correlated shocks are more likely to occur. In column (1), we exclude the most cyclical industries,

characterized by the highest correlation between their own output and UK GDP.[1] In column (2), we drop the most energy-intensive industries.[2] In column (3), we finally exclude the industries originally identified by Autor et al. (2013) as having experienced similar fluctuations across countries over the sample period, due to technological innovations, housing booms, and the rapid growth of emerging economies.[3] The coefficient on the import shock IS remains stable, and close to the baseline estimate, across all these sub-samples.

B.3. Clustering and Definitions of the Instrument

In Figure A2, we study the robustness of the baseline estimates (see column 7 of Table 5) to the use of alternative definitions of the instrument and alternative ways of clustering the standard errors. As for clustering, we use: (1) two-way clustering by sector and individual, to account for possible serial correlation in the error terms within individuals; and (2) wild cluster bootstrap (Cameron et al., 2008), to account for the relatively moderate number of clusters. As for the instrument, the first alternative definition we use is the weighted average of log changes in foreign countries' exports:

$$WES\ Shock^{5}_{\psi(i,0),t} = \sum_{c} \mu_{c,\psi(i,0),t-6} \times \left(\ln WES_{c,\psi(i,0),t-1} - \ln WES_{c,\psi(i,0),t-6} \right) .$$

Unlike the baseline definition in eq. (3), this alternative definition tends to exacerbate the weight of small exporting countries, as a given increase in exports corresponds to a larger change in log exports for lower initial export values. The second version of the instrument is constructed using time-invariant import shares at the beginning of the sample:

$$WES\ Shock^{5}_{\psi(i,0),t} = \ln \left(\sum_{c} \mu_{c,\psi(i,0),95} \times WES_{c,\psi(i,0),t-1} \right) - \ln \left(\sum_{c} \mu_{c,\psi(i,0),95} \times WES_{c,\psi(i,0),t-6} \right) .$$

This definition does not capture supply shocks of countries with initial shares equal to zero, and thus isolates variation in UK imports only along an intensive margin. Finally, we re-construct the instrument as in eq. (3) but including the US and Canada in the set of foreign countries. The results are remarkably stable across all these alternative clustering choices and definitions of the instrument.

C. Further Results

C.1. Additional Evidence on the Channels

In Table A5, we report the estimates of eq. (8) and (9) using four distinct components of job satisfaction: total pay, job security, workload (hours worked), and the content of the job. We construct four dummies equal to 1 if the individual declares to be satisfied with each aspect of the job. The results, reported in columns (1)-(4), show that all dimensions of job satisfaction are negatively correlated with GHQ-12. Moreover, import shocks lead to a deterioration in all dimensions of job satisfaction, with significant coefficients for job security, workload, and the content of the job itself. In column (5), we focus on a different proxy for expectations about the future. This variable captures financial expectations, and is a dummy equal to 1 if the individual expects a stable or improved financial situation over the next year. The results show that this proxy for expectations is negatively correlated with GHQ-12 and negatively affected by import shocks.

[1] In particular, we exclude all 3-digit industries within the following 2-digit sectors: Manufacture of coke, refined petroleum products and nuclear fuel (NACE 23); Manufacture of rubber and plastic products (NACE 25); Manufacture of radio, television and communication equipment and apparatus (NACE 32); Air transport (NACE 62); Post and telecommunications (NACE 64).

[2] These are all industries in the following 2-digit sectors: Manufacture of pulp, paper and paper products (NACE 21); Manufacture of coke, refined petroleum products and nuclear fuel (NACE 23); Manufacture of chemicals and chemical products (NACE 24); Manufacture of other non-metallic mineral products (NACE 26); Manufacture of basic metals (NACE 27).

[3] These are all industries in the following 2-digit sectors: Manufacture of textiles (NACE 17); Manufacture of wearing apparel; dressing and dyeing of fur (NACE 18); Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear (NACE 19); Manufacture of other non-metallic mineral products (NACE 26); Manufacture of basic metals (NACE 27); Manufacture of fabricated metal products, except machinery and equipment (NACE 28); Manufacture of office machinery and computers (NACE 30).

C.2. Additional Evidence on Export and Technology Shocks

In Table A6, we repeat the specification in column (5) of Table 12 using different dependent variables: GHQ-12 in column (1); a dummy for whether the individual suffers from anxiety, depression, and psychiatric problems in column (2); a dummy for whether the individual exhibits clinical conditions related to strokes in column (3); and a dummy for suicidal ideation (GHQ-12 above 19) in column (4). Consistent with the results reported in the main text, we find that neither export nor technology shocks increase mental distress. If anything, these shocks are found to slightly reduce the incidence of anxiety, depression, and psychiatric problems.[4]

[4]Recall that technological progress is associated with a lower value of TS, so a positive coefficient on TS indicates that technological progress reduces the incidence of a given condition.

Table A1: Comparison between the BHPS and the UK Census by Industry

	Age		Male		Married		Divorced		Separated		Single Elderly		Couple, No Child.	
	BHPS	Census	BHPS	Census	BHPS	Census	BHPS	Census	BHPS	Census	BHPS	Census	BHPS	Census
A-B	43.42	43.32	0.79	0.76	0.64	0.60	0.02	0.06	0.03	0.02	0.01	0.01	0.24	0.28
C	40.08	41.74	0.89	0.87	0.58	0.65	0.11	0.08	0.06	0.03	0.00	0.00	0.36	0.27
D	38.58	40.42	0.74	0.73	0.60	0.57	0.04	0.08	0.01	0.02	0.00	0.00	0.27	0.28
E	40.92	39.07	0.75	0.73	0.71	0.57	0.03	0.08	0.01	0.02	0.00	0.00	0.29	0.27
F	38.23	40.38	0.92	0.90	0.59	0.56	0.02	0.08	0.01	0.02	0.00	0.00	0.25	0.25
G	37.97	37.56	0.46	0.51	0.54	0.50	0.04	0.08	0.03	0.03	0.01	0.00	0.24	0.24
H	35.70	35.42	0.35	0.42	0.42	0.42	0.08	0.08	0.03	0.03	0.01	0.00	0.20	0.20
I	38.78	39.96	0.74	0.72	0.56	0.54	0.05	0.09	0.03	0.03	0.00	0.00	0.25	0.26
J	35.89	36.51	0.44	0.47	0.56	0.51	0.04	0.07	0.02	0.02	0.00	0.00	0.28	0.28
K	38.96	39.38	0.57	0.57	0.54	0.51	0.05	0.08	0.02	0.03	0.01	0.00	0.30	0.30
L	40.19	39.74	0.49	0.54	0.62	0.56	0.06	0.09	0.02	0.03	0.00	0.00	0.29	0.27
M	42.50	42.65	0.25	0.29	0.66	0.63	0.06	0.08	0.02	0.03	0.01	0.00	0.28	0.26
N	40.62	41.34	0.16	0.19	0.59	0.58	0.07	0.11	0.02	0.04	0.01	0.00	0.24	0.26
O	39.19	38.37	0.44	0.47	0.52	0.46	0.04	0.08	0.02	0.03	0.01	0.00	0.28	0.26
P	44.47	40.51	0.21	0.22	0.63	0.45	0.00	0.12	0.03	0.02	0.03	0.00	0.29	0.29

	Couple Dep. Children		Couple Non-Dep. Children		Lone Parent Dep. Children		Lone Parent Non-Dep. Children		Household Size		Owned House or Mortgage	
	BHPS	Census	BHPS	Census	BHPS	Census	BHPS	Census	BHPS	Census	BHPS	Census
A-B	0.41	0.33	0.18	0.19	0.01	0.02	0.05	0.05	3.23	3.04	0.75	0.71
C	0.31	0.39	0.11	0.16	0.00	0.01	0.00	0.02	2.67	2.97	0.78	0.85
D	0.42	0.35	0.16	0.16	0.02	0.02	0.03	0.04	3.11	2.95	0.82	0.82
E	0.40	0.38	0.17	0.15	0.01	0.03	0.03	0.03	3.07	2.99	0.90	0.85
F	0.43	0.39	0.17	0.17	0.02	0.02	0.03	0.04	3.21	3.10	0.80	0.81
G	0.38	0.37	0.17	0.16	0.05	0.05	0.04	0.04	3.14	3.12	0.75	0.78
H	0.34	0.35	0.15	0.13	0.09	0.08	0.05	0.04	3.14	3.22	0.57	0.64
I	0.42	0.35	0.14	0.15	0.03	0.03	0.04	0.04	3.11	2.96	0.81	0.78
J	0.40	0.34	0.13	0.12	0.03	0.03	0.03	0.03	2.94	2.88	0.89	0.84
K	0.35	0.31	0.11	0.12	0.03	0.03	0.04	0.03	2.89	2.83	0.80	0.78
L	0.39	0.35	0.12	0.12	0.05	0.04	0.04	0.04	2.95	2.88	0.86	0.80
M	0.37	0.39	0.15	0.12	0.05	0.05	0.03	0.03	3.00	3.00	0.85	0.83
N	0.38	0.35	0.12	0.13	0.08	0.06	0.04	0.04	3.06	2.97	0.81	0.79
O	0.35	0.31	0.13	0.14	0.06	0.05	0.03	0.04	2.99	2.91	0.72	0.73
P	0.39	0.19	0.13	0.12	0.05	0.06	0.08	0.03	3.03	2.98	0.53	0.65

Notes. Source: British Household Panel Survey and UK Census for the year 2001. Industry codes refer to the NACE Rev 1.1 classification. See Table 2 for the description of industries. All figures are simple averages computed across all employed and self-employed workers in an industry.

Table A2: Weighted Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	a) 2SLS (second stage)						
IS	1.341***	1.452***	1.407***	1.636***	1.528***	1.332***	1.334***
	[0.186]	[0.167]	[0.206]	[0.230]	[0.262]	[0.336]	[0.329]
R^2	0.50	0.51	0.51	0.52	0.52	0.56	0.56
Obs.	22452	22452	22452	22452	22452	22452	22452
	b) 2SLS (first stage)						
WES Schock	0.183***	0.181***	0.170***	0.166***	0.147***	0.145***	0.145***
	[0.007]	[0.008]	[0.007]	[0.008]	[0.006]	[0.006]	[0.007]
Kleibergen-Paap *F*-stat.	657.4	500.7	527.5	485.6	707.6	689.2	690.7
	c) OLS						
IS	0.050	0.103**	0.156***	0.165***	0.130***	0.158***	0.160***
	[0.079]	[0.043]	[0.036]	[0.036]	[0.042]	[0.054]	[0.050]
R^2	0.51	0.51	0.52	0.52	0.52	0.57	0.57
Obs.	22452	22452	22452	22452	22452	22452	22452
	d) Reduced-Form (OLS)						
WES Schock	0.246***	0.262***	0.239***	0.271***	0.226***	0.193***	0.193***
	[0.038]	[0.030]	[0.035]	[0.035]	[0.035]	[0.046]	[0.046]
R^2	0.51	0.51	0.52	0.52	0.52	0.57	0.57
Obs.	22452	22452	22452	22452	22452	22452	22452
Individual FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓						
Sector×year FE		✓	✓	✓	✓	✓	✓
Industry controls			✓	✓	✓	✓	✓
Individual controls				✓	✓	✓	✓
Occupation×year FE					✓	✓	✓
LLM×year FE						✓	✓
Interview FE							✓

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. The control variables and fixed effects are the same as in Table 5. The regressions are weighted using the longitudinal weights provided by the BHPS. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

Table A3: Definitions of Import Competition

	Definition of Import Competition		
	Log Change in Imports/Turnover (1)	Log Change in Imports/Absorption (2)	Change in Real Imports over Initial Absorption (3)
2SLS (2nd stage)			
IS (imports/turnover)	1.262***		
	[0.255]		
IS (imports/absorption)		1.245***	
		[0.251]	
IS (imp./init. absorp.)			8.903***
			[2.952]
R^2	0.59	0.59	0.52
Obs.	29405	29405	29405
2SLS (1st stage)			
WES Shock	0.137***	0.139***	0.030***
	[0.006]	[0.006]	[0.006]
Kleibergen-Paap *F*-Statistic	539.8	548.5	24.4

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. In column (1), *IS* is defined as in eq. (1) but using the ratio of imports over turnover in place of real imports; in column (2), *IS* is defined as in eq. (1), but using the ratio of imports over domestic absorption (production plus imports minus exports) in place of real imports; in column (3), *IS* is defined as the change in real imports between $t-6$ and $t-1$ divided by domestic absorption at $t-6$. The instrument *WES Shock* is defined as in eq. (3) in all columns expect for column (3), where it is defined as the change in foreign countries' world export supply between $t-6$ and $t-1$ divided by domestic absorption at $t-6$. All regressions include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

Table A4: Threats to Identification

	Excluding Industries		
	GDP Correlated (1)	Energy Intensive (2)	Highly Volatile (3)
2SLS (2nd stage)			
IS	1.012***	1.242***	1.140***
	[0.206]	[0.271]	[0.230]
R^2	0.59	0.59	0.59
Obs.	28984	28611	28564
2SLS (1st stage)			
WES Shock	0.150***	0.151***	0.151***
	[0.006]	[0.005]	[0.005]
Kleibergen-Paap *F*-Statistic	720.4	975.6	1010.6

Notes. The dependent variable is GHQ-12, rescaled between 0 and 100. Column (1) excludes industries with the highest correlation between their own output and UK GDP (all 3-digit industries within sectors: NACE 23, 25, 32, 62, and 64). Column (2) excludes the most energy-intensive industries (all 3-digit industries within sectors: NACE 21, 23, 24, 26, and 27). Column (3) excludes volatile industries (all 3-digit industries within sectors: NACE 17, 18, 19, 26, 27, 28, and 30). All regressions include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

Table A5: Additional Evidence on the Channels

	(1)	(2)	(3)	(4)	(5)
	a) Correlates of Mental Distress (Dep. Var.: GHQ-12; Estimator: OLS)				
Job sat. (pay)	-1.972***				
	[0.283]				
Job sat. (security)		-3.041***			
		[0.160]			
Job sat. (job itself)			-4.949***		
			[0.241]		
Job sat. (workload)				-3.282***	
				[0.122]	
Expect. (financial)					-2.180***
					[0.193]
R^2	0.59	0.60	0.60	0.60	0.59
Obs.	23252	23213	23264	23271	23282
	b) Trade Exposure and Correlates of Mental Distress				
	Job Sat. (Pay)	Job Sat. (Security)	Job Sat. (Job Itself)	Job Sat. (Workload)	Expect. (Financial)
2SLS (2nd stage)					
IS	-0.003	-0.029***	-0.015*	-0.012*	-0.013*
	[0.014]	[0.005]	[0.007]	[0.007]	[0.007]
R^2	0.57	0.52	0.54	0.56	0.42
Obs.	23252	23213	23264	23271	23282
2SLS (1st stage)					
WES Shock	0.160***	0.160***	0.161***	0.161***	0.160***
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
Kleibergen-Paap *F*-Statistic	1759	1743	1780	1801	1584

Notes. In panel a), the dependent variable is GHQ-12, rescaled between 0 and 100, and the regressions are estimated by OLS. In panel b), the dependent variables are indicated in the columns' headings, and the regressions are estimated by 2SLS. *Job sat.* (pay) is a dummy equal to 1 if the individual declares to be satisfied with her pay. *Job sat.* (security) is a dummy equal to 1 if the individual declares to be satisfied with her job security. *Job sat.* (workload) is a dummy equal to 1 if the individual declares to be satisfied with her workload. *Job sat.* (job itself) is a dummy equal to 1 if the individual declares to be satisfied with the content of her job. *Expect.* (financial) is a dummy equal to 1 if the individual expects a stable or improved financial situation over the next year. All regressions are estimated on the sample of workers who do not switch out of employment in a given year. All regressions include the same controls and fixed effects as in column (7) of Table 5. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

Table A6: Additional Evidence on Export and Technology Shocks

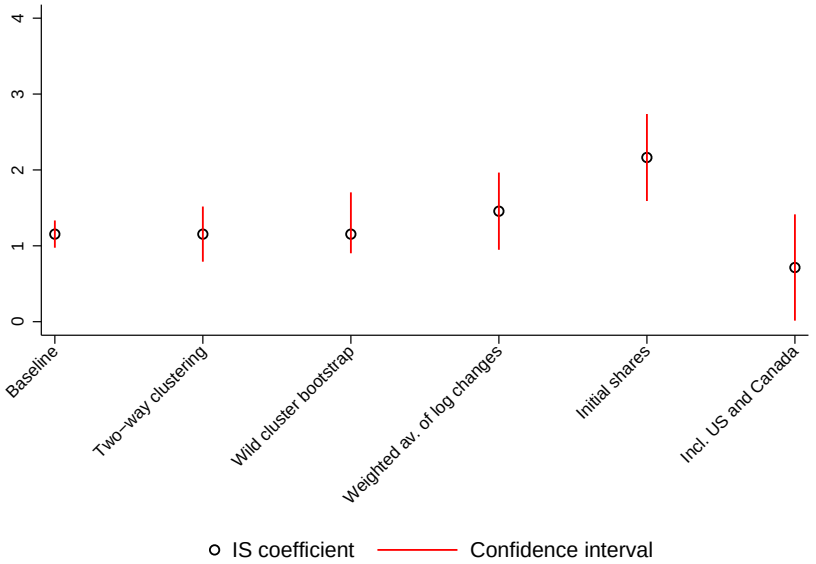
	GHQ	Anxiety & Depression	Stroke	$GHQ \geq 19$
	(1)	(2)	(3)	(4)
IS	1.041**	0.018***	0.000	0.013**
	[0.481]	[0.005]	[0.003]	[0.005]
ES	-0.301	-0.048***	-0.018*	-0.019
	[1.742]	[0.010]	[0.009]	[0.018]
TS	0.061	0.048***	0.007	0.008
	[2.558]	[0.015]	[0.010]	[0.022]
R^2	0.59	0.57	0.40	0.45
Obs.	29405	29405	29405	29405
F-Stat Excl. Instr. (min)	311.3	311.3	311.3	311.3
F-Stat Excl. Instr. (max)	1717.2	1717.2	1717.2	1717.2
Kleibergen-Paap F-Statistic	120.7	120.7	120.7	120.7

Notes. The dependent variables are indicated in the columns' headings and are: GHQ-12, rescaled between 0 and 100 (column 1); dummies for whether the individual exhibits clinical conditions related to anxiety, depression, or psychiatric problems (column 2) and strokes (column 3); and a dummy for whether GHQ-12 is greater than or equal to 19 (column 14) on a 0-36 scale. All specifications control for the same variables and fixed effects, and use the same instruments, as in column (5) of Table 12. The standard errors are corrected for clustering at the sector level. ***, **, * indicate significance at the 1, 5 and 10% level, respectively.

Figure A1: Life Cycle Profile of Mental Distress

Notes. The figure plots the coefficients on dummies for different age groups (indicated on the horizontal axis) obtained from a regression of GHQ-12 on these dummies, plus individual and year fixed effects, using the whole sample of workers in the BHPS. The confidence intervals are based on standard errors corrected for clustering at the individual level.

Figure A2: Alternative Clustering and Definitions of the Instrument



Notes. The figure reports the coefficient on *IS* obtained by estimating the specification in column (7) of Table 5 with alternative ways of clustering the standard errors and alternative definitions of the instrument. Moving from left to right, the coefficients correspond to the following versions of the specification: (1) baseline; (2) standard errors corrected for two-way clustering by sector and individual; (3) standard errors obtained through wild cluster bootstrap; (4) instrument constructed as the weighted average of log changes in foreign countries' exports; (5) instrument constructed using time-invariant import shares in the year 1995; and (6) instrument constructed including the US and Canada among both the origin and the destination countries.