Globalization and Mental Distress*

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Abstract

We study the effect of import competition on workers' mental distress. To this purpose, we source information on the mental health of British workers from the British Household Panel Survey, and combine it with measures of import competition in more than 100 industries over 1995-2007. We find that, controlling for a wide range of individual, household, and industry characteristics, an increase in import competition in a worker's industry of employment has a positive, statistically significant, and large impact on individual mental distress. Following a one standard deviation increase in import competition, a worker would need a yearly monetary compensation of 180 British pounds to make up for the ensuing utility loss; on aggregate, across all workers, the average import shock would then entail a total compensation of 4.2 billion pounds (0.3% of UK GDP). We provide evidence on some of the possible mechanisms through which import competition may affect mental distress. In particular, we find that import competition is associated with higher likelihood of job displacement, lower wage growth, lower job satisfaction due to heavier workload and greater job insecurity, and gloomier expectations about future career progression and financial perspectives.

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1 Introduction

One of the most pressing concerns for developed countries nowadays is the growing incidence of mental distress among their working-age population. Twenty percent of workers in the OECD countries currently suffer from some form of mental disorder, and 50% of people experience mental health problems at least once over their lifetime (OECD, 2015). In this paper we argue that the increased competitive pressure brought about by globalization is an important determinant of this phenomenon. Our analysis focuses on the UK, a country where globalization and mental distress have both grown in relevance over recent years. The overall cost of mental illness for the British economy has reached 4.5% of GDP (OECD, 2014), and trade integration has entailed a strong rise in import competition, with real imports growing by 75% over the period of analysis (1995-2007).

Our first contribution is to show that import competition determines a significant increase in workers' mental distress. Second, we provide evidence on some of the microeconomic mechanisms underlying this effect. In particular, we find that import competition is associated with an increase in the risk of job displacement, a reduction in wage growth, lower job satisfaction due to heavier workload and greater job insecurity, and gloomier expectations about future career progression and financial perspectives. All these outcomes are in turn associated with higher mental distress. Overall, our results suggest that the distributional consequences of import competition may be stronger and more widespread in society than thought until now. Our evidence may therefore provide an explanation for the recent upsurge of anti-globalization sentiment observed in the UK and other developed countries.

The empirical analysis builds on a novel and unique data set. We use the British Household Panel Survey (BHPS) to obtain yearly information on mental health and other individual characteristics for a nationally representative sample of UK residents over time.[1] We

[1] In comparison, other databases containing information on individuals' health either cover 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 in Europe) or do not report information on mental health on a yearly basis (e.g., the Socio Economic Panel for Germany and the National Longitudinal Survey of Youth for the US).

measure mental distress using the Generalized Health Questionnaire indicator (GHQ-12), an index that is widely employed by clinicians for detecting psychiatric illness and extensively used in academic research on mental health.[2] We combine these individual-level data with measures of import competition in more than 100 industries covering the entire UK economy.

Our identification strategy consists of comparing changes in mental health across similar individuals, who are employed in similar industries except for the import competition shock. Since the BHPS is a panel data set, with repeated information for the same person over time, we can condition the estimation not only on observable individual characteristics, but also on individual fixed effects. These remove differences in the level of mental health across individuals, and allow us to exploit within-person variation in mental distress for identification. To account for possible correlation between import competition and unobserved industry-specific shocks in the UK, we also instrument import competition using non-UK exports to the rest of the world (Autor et al., 2014). This IV strategy is meant to isolate the variation in import competition due to changes in supply conditions in the exporting countries.[3]

We find that import competition has a strong effect on mental distress. In particular, our estimates imply that a one standard deviation increase in import competition in a worker's industry of employment raises GHQ-12 by 0.8 percentage points. This corresponds to about 8.5% of the within-individual standard deviation in mental distress. This effect is similar to that of a commensurate increase in crime rates across UK local areas, as estimated by Dustmann and Fasani (2016).[4] To further quantify the size of the effect, we compute the monetary compensation that an individual worker would need to make up for the ensuing utility loss. Mapping GHQ-12 scores into a health-based quality-of-life

[2] See, most notably, Clark and Oswald (1994), Clark (2003), Oswald and Powdthavee (2008), MacKerron (2012), and Dustmann and Fasani (2016) for studies using GHQ-12 in the economics literature on mental health. See also Goldberg (1978), Easton and Turner (1991), Graetz (1991), Politi et al. (1994), McCabe et al. (1996), Goldberg et al. (1997), Hu et al. (2007), and Serrano-Aguilar et al. (2009) for papers using GHQ-12 in medicine and psychology.

[3] Autor et al. (2014) use a similar empirical set-up to study the effects of Chinese imports into the US at the industry level on the earnings of American workers.

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

index, we find that this compensation would amount to 180 British pounds per person in a year. On aggregate, a simple back-of-the-envelope calculation then suggests that the average import shock would entail a total yearly compensation of roughly 4.2 billion pounds, i.e., 0.3% of UK GDP.

These results are robust to a large range of sensitivity checks. In particular, we find similar effects when: (1) using alternative measures of import competition and mental health; (2) employing alternative instruments and identification strategies; (3) controlling for pre-existing industry trends and contemporaneous shocks that may threaten identification; and (4) addressing the possibly non-random sorting of individuals across industries. Furthermore, we find the effect of import competition to be relatively stable across individuals of different age and gender, as well as across full-time and part-time employees, and across permanent and temporary workers. The effect is milder for long-tenure workers and for the self-employed, consistent with these people having a stronger attachment to their firms and being more likely to operate in low-tradable jobs, respectively.

In the last part of the paper, we report correlations hinting to some of the microeconomic mechanisms through which import competition may affect mental health, in line with the economic literature on the determinants of mental distress. The first channel we consider is related to job displacement. We find import competition to be associated with a substantial increase in the probability of job displacement, which in turn is associated with a strong rise in workers' mental distress.[5] Then, we provide evidence that the effects of import competition are not limited to displaced workers, but extend to the wider population of continuously employed individuals. One channel through which this may happen is related to wage changes. Indeed, focusing on the sub-sample of workers who remain employed, we find that import competition is accompanied by lower wage growth, which in turn is associated with higher mental distress.[6] This suggests that stronger competitive

[5] See, e.g., Ruhm (2000), Clark (2003), Sullivan and von Wachter (2009), Marcus (2013), Black et al. (2015), and Farrè et al. (2015) for related evidence on the mental health consequences of unemployment.

[6] Consistent with these results, Ettner (1996) and McInerney et al. (2013) show that mental distress is sensitive to large changes in income, such as those experienced by lottery winners or as a result of large stock market fluctuations.

pressure may affect the mental conditions of non-displaced British workers by flattening their earnings profile.

The above results point to the fact that, by worsening mental health, import competition may expose workers to additional adjustment costs, on top of the pecuniary losses directly entailed by unemployment spells and lower wage growth. These additional costs are not reflected in observable labor market statistics and, as discussed below, they have been neglected by previous studies on the labor market effects of import competition. As a result, this literature may have underestimated the distributional consequences of globalization.

In addition, we provide evidence that import shocks also hit non-displaced workers conditional on wage growth. The consequences of globalization for people who experience no changes in observable labor market outcomes (i.e., job status and wages) have been largely overlooked until now. Our analysis constitutes a first step in that direction.

One mechanism through import competition may affect the mental health of these people is by reducing their job satisfaction. Indeed, focusing on continuously employed workers and controlling for wage growth, we find that import competition is associated with a worsening of job satisfaction, and that individuals who are less satisfied with their job tend to be more mentally distressed. The unique richness of our database also allows us to probe deeper into the determinants of job satisfaction. Intuitively, we find that import competition is not correlated with workers' satisfaction about the content of the job itself. However, it is associated with people becoming less satisfied with their working conditions, particularly due to higher workload and reduced job security.[7]

Finally, we find that a further mechanism through which import competition may affect mental health is through changes in future expectations. In particular, we consider measures of expectations about job promotion and the personal financial situation of each worker.[8] Controlling for all the previous channels, we find that import competition is asso-

[7] Our results provide empirical support to recent theoretical studies on the effects of stress and job insecurity on mental health (e.g., Wälde, 2015, and Iossa and Sacco, 2017). They are also consistent with the applied psychology literature on the occupational, organizational and health consequences of job insecurity (see Sverke et al., 2002, and Cheng and Chan, 2008 for recent reviews).

[8] Böckerman and Maliranta (2013) use a similar measure of expectations about job promotion in a study

ciated with a deterioration of individuals' future expectations, and that people with worse expectations tend to display higher levels of mental distress.

Overall, our results point to the existence of new adjustment costs of import competition. These costs do not rule out that the overall welfare effect of globalization can be positive. Yet, they imply that the distributional consequences of foreign competitive pressure may be worse than thought until now. In particular, our results suggest that the adverse effects of import competition are more widespread and pervasive in society than usually believed. Our evidence may thus provide an explanation for why recent trade liberalization attempts, such as the Transatlantic Trade and Investment Partnership (TTIP), have faced harsh opposition in many segments of the European society, and for why trade exposure has been found to explain the rising support for protectionist and nationalist parties or candidates (Colantone and Stanig, 2016b; Autor et al., 2016b, and Che et al., 2016), up to the point of becoming one of the main determinants of Brexit (Colantone and Stanig, 2016a).

Beside the work cited above, our paper connects with two other strands of empirical research. The first is the literature on the labor market effects of import competition in developed countries.[9] These papers focus on standard labor market outcomes and find that workers employed in import competing industries bear significant adjustment costs to import competition, in terms of higher probability of job displacement and lower wage growth. The intuition is that foreign imports displace domestic production in comparative disadvantage industries; in the presence of frictions to the reallocation of labor across sectors, this leads to a higher incidence of unemployment and to lower earnings.[10] Our key contribution to this literature is to show that, by increasing mental distress, import competition implies additional adjustment costs. We also find evidence that these costs are

on outsourcing in the context of Finland. Iossa and Sacco (2017) study theoretically the relation between expectations about job promotion, stress and health.

[9] See, in particular, Bernard et al. (2006), Wälde and Weiß(2007), Autor et al. (2013, 2014, 2015, 2016a), Dauth et al. (2014), Acemoglu et al. (2016), and Pierce and Schott (2016a).

[10] In addition, import competition may foster technical change (e.g., Acemoglu, 2002; Bloom et al., 2016; Autor et al., 2016c), which in turn may lead to job destruction and raise unemployment (Michelacci and Lopez-Salido, 2007).

not limited to displaced workers but extend to a larger population of individuals, including those who do not witness significant changes in observable labor market outcomes. Clearly, because our results are identified through differences in import pressure across industries, they capture relative effects of foreign competition. Therefore, similar to the above literature, our findings do not speak to the overall welfare effects of globalization but to its distributional consequences.

Most importantly, our paper is related to a nascent literature on the non-pecuniary effects of globalization. A few recent papers are starting to look at the implications of trade for job-related injuries (McManus and Schaur, 2016), illness (Lang et al., 2016) and mortality (Pierce and Schott, 2016b; Bombardini and Li, 2016; Adda and Fawaz, 2017), using firm-level or regional data.[11] Unlike these papers, we study the effects of import competition on mental health and we use individual-level data. Hence, we provide the first evidence on the individual-level responses of mental distress to import competition, and on some of the underlying microeconomic mechanisms. A contemporaneous working paper by Hummels et al. (2016) also uses individual-level data to study how export shocks, by expanding the scale of firms' operations, affect the prevalence of injuries, use of antidepressants and visits to psychiatrists among Danish workers. Their results are complementary to ours, as we highlight a different and so far unexplored mechanism through which trade may affect individual mental health.[12]

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 the empirical results. Section 5 concludes.

[11] McManus and Schaur (2016) and Lang et al. (2016) report that import competition has caused more injuries and illness across US firms and counties, respectively. Pierce and Schott (2016b) and Adda and Fawaz (2017) find that import competition has increased mortality rates due to suicides and accidental poisoning in US counties. Bombardini and Li (2016) show that export growth has raised pollution and pollution-related mortality in Chinese prefectures.

[12] For additional contributions on the non-pecuniary effects of globalization, see Autor et al. (2017) on import competition and the marriage market in the US; Dix-Carneiro et al. (2017) on trade liberalization and crime in Brazil; Feler and Senses (2016) on import competition and the provision of local public goods in the US; and Giuntella and Mazzonna (2015) and Giuntella et al. (2016) on immigration and health in Europe.

2 Data and Variables

In this section, we describe the data and provide some descriptive statistics.

2.1 The British Household Panel Survey

Our main data source is the British Household Panel Survey (BHPS). This database covers a representative sample of the British population aged 16 or more. 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 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 become part of the survey.[13] We focus in particular on seven waves of the BHPS, spanning the period 2001-2007. As discussed in Section 2.3, by considering this time period we can construct import competition measures that rely on lagged trade data for all the industries in our sample since 1995, while excluding the recent financial crisis. Overall, in our regressions we use approximately 50,000 individual-year observations, corresponding to 10,121 individuals observed on average for about 5 years.

The BHPS has a number of unique features, which are crucial for our analysis. In particular, it provides extremely detailed information on mental health for each individual over time, along with a wealth of individual and household characteristics, including demographic variables, employment status, and physical health. Moreover, the BHPS contains information on each person's industry of employment in every year, thereby making it possible to match the individual-level data with proxies for import competition and other industry characteristics. The richness of the resulting data set allows us to: (i) study how import competition affects mental distress at the worker level; and (ii) provide evidence on some of the mechanisms underlying this effect.

[13] More generally, the nature of the BHPS implies that not all individuals are observed in all years. In particular, some individuals belonging to surveyed households may turn 16—and thus start to be interviewed—over the sample period. Others may join existing surveyed households, or form new families with some of the 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. In a robustness check reported in Section 4.1.1 we show that our results are virtually unchanged when focusing only on the sub-sample of individuals who are observed in all years.

Table 1: GHQ Questions and Answers

GHQ 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

Source: British Household Panel Survey.

2.2 The Measure of Mental Health

Our main proxy for mental health 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. The twelve questions and the four answers are listed in Table 1.

The GHQ-12 indicator is obtained as the sum of the values taken by the answers to the twelve questions ('Likert scoring method'). As such, it ranges from 0 (least distressed) to 36 (most distressed). In our baseline specifications, we rescale the index to range between 0 and 100. This implies that each regression coefficient can be interpreted as the percentage point effect of the corresponding variable on mental distress.

In Section 4.1.2, we assess the robustness of our results using a different scoring method, which assigns a 0 to the two answers corresponding to the lowest levels of distress, and a 1 to the two answers corresponding to the highest levels ('Caseness bimodal scoring'). Accordingly, this alternative version of GHQ-12 ranges from 0 to 12. Also in this case, we

rescale the index between 0 and 100. Furthermore, we present additional results based on the individual answers to the twelve questions, thereby fully leveraging the rich information underlying the overall GHQ-12 score.

Using a self-reported measure like GHQ-12 allows capturing the entire spectrum of mental distress cases, many of which may not evolve into clinical conditions measurable through non self-reported indicators, such as use of antidepressants or hospitalization. A large literature in medicine and psychiatrics 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 changes in mental health (e.g., Graetz, 1991; Politi et al., 1994; McCabe et al., 1996; Goldberg et al., 1997; Hu et al., 2007). 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).

Crucially for us, GHQ-12 is particularly well suited for detecting short-run within-individual changes in mental distress. The reason is that, as shown in Table 1, each person must answer each of the twelve questions by indicating how the corresponding determinant of mental health has changed in a given year compared to her usual condition. Thanks to the availability of repeated information on GHQ-12 for each respondent, we can exploit within-individual variation for identification. On the contrary, since the 'usual' (i.e., reference) condition changes both across individuals and over time for the same person, GHQ-12 is not well-suited to capture either long-run psychiatric disorder or aggregate, population-wise, trends in mental health.

2.3 Import Competition and Other Industry Characteristics

Using the information on each worker's industry of employment, we link the individual-level data from the BHPS with industry-level data on import competition and other vari-

ables. We observe individuals employed in 122 industries (mostly classified at the 3-digit level of the NACE Rev. 1.1 classification), of which 103 are in the manufacturing sector and the remaining 19 are in services. The latter include industries that are very relevant employers nowadays especially in the UK, such as business services, utilities, transport, research and development, finance and insurance.

We use the conventional definition of import competition, namely, the ratio of imports over apparent consumption (production plus imports minus exports). For the manufacturing industries, we source trade data from Eurostat-Comext and production data from the UK Office for National Statistics. For the services industries, we use official data on trade and production from the World Input-Output Database (WIOD).[14]

Next, we define the import competition shock IC_{jt-1} as the 5-year % change in import competition in the industry j in which a given worker was employed in year $t-1$. We then relate IC_{jt-1} to the mental distress of the same worker in year t. Because trade and production data are available for all industries since 1995, and IC_{jt-1} is constructed using six lags of data, our final estimation sample includes BHPS waves from 2001 to 2007.

2.4 Summary Statistics

Table 2 reports descriptive statistics on the individual- and household-level variables contained in the BHPS. The average age of individuals in our sample is 41 years, and the sample is equally split between males and females. Roughly 93% of individuals are either employed or self-employed. Three-fourths of the sample consist of individuals who are married or live as a couple, either with no dependent children (43%) or with some dependent child (38%). Average household size is 3 persons. Almost 83% of individuals own a house, while 16% of people live in a rented flat.

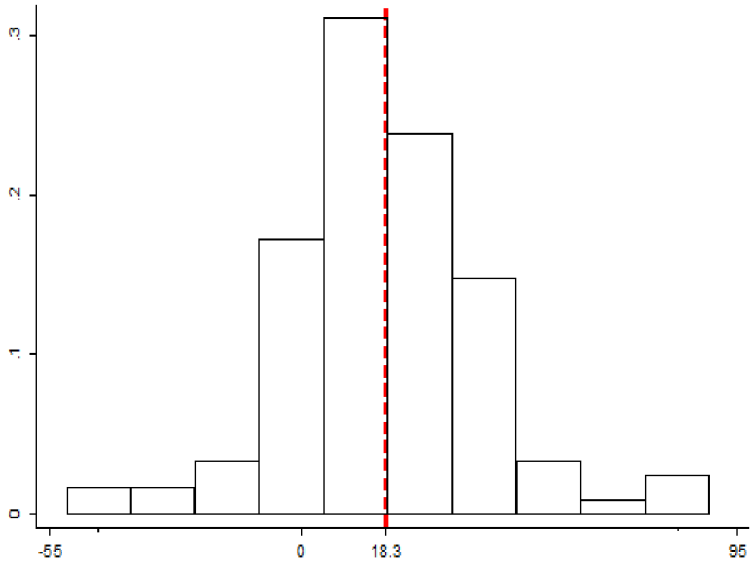
[14] See Timmer et al. (2015) and the official web page of WIOD (www.wiod.org) for details.

Table 2: Descriptive Statistics on the Individual- and Household-Level Variables

	Mean	Overall S.D.	Obs.		Mean	Overall S.D.	Obs.
GHQ-12 - Overall (Likert score)	30.0	14.2	52781	Never married	17.0	37.5	52753
GHQ-12 - Overall (Caseness score)	13.8	23.6	52781	Self-employed	10.9	31.2	52779
GHQ 12 - Anxiety and depression	30.8	20.1	52781	Employed	82.2	38.2	52779
GHQ 12 - Social dysfunction	33.9	12.7	52781	Unemployed	1.7	12.9	52779
GHQ 12 - Loss of confidence	17.1	20.8	52781	Retired	1.6	12.4	52779
Physical health	7.8	9.9	52781	Maternity leave	0.8	8.8	52779
Age	41.1	12.2	52778	Family care	1.1	10.6	52779
Male	50.3	50.0	52781	FT student, school	0.7	8.5	52779
Higher degree	4.1	19.8	51805	LT sick, disabled	0.6	7.6	52779
First degree	15.0	35.7	51805	GVT training scheme	0.1	2.6	52779
Teaching QF	2.3	15.0	51805	Other job status	0.3	5.5	52779
Other higher QF	31.4	46.4	51805	Household size	3.0	1.3	52781
Nursing QF	0.9	9.6	51805	Single non-elderly	8.4	27.8	52781
GCE A levels	12.5	33.1	51805	Single elderly	0.8	9.0	52781
GCE O levels or equivalent	17.2	37.7	51805	Couple, no children	27.4	44.6	52781
Commercial QF, no O levels	1.7	12.8	51805	Couple, dep. children	37.7	48.5	52781
CSE grade 2-5, scot grade 4-5	3.3	17.9	51805	Couple, non-dep. children	14.9	35.6	52781
Apprenticeship	1.0	9.9	51805	Lone parent, dep. children	4.3	20.3	52781
Other QF	0.5	6.8	51805	Lone parent, non-dep. children	3.7	18.9	52781
No QF	10.0	30.0	51805	2+ unrelated adults	1.4	11.9	52781
Still at school, no QF	0.2	4.2	51805	Other households	1.4	11.6	52781
Married	59.5	49.1	52753	Owned house or on mortgage	82.7	37.8	52549
Living as couple	14.7	35.4	52753	Shared house ownership	0.4	6.5	52549
Widowed	1.3	11.4	52753	Rented house	15.6	36.2	52549
Divorced	5.5	22.9	52753	Rent-free house	1.0	10.1	52549
Separated	2.0	13.9	52753	Other house types	0.3	5.1	52549

Source: British Household Panel Survey, 2001-2007.

Figure 1: Distribution of the Import Competition Shock across Industries



Notes: The figure reports industry-level averages of the import competition shock IC over the period 2001-2007. The dashed line corresponds to the sample mean (18.3%). Source: Eurostat-Comext, UK ONS, and WIOD.

Turning to the mental health indicators, GHQ-12 (rescaled between 0 and 100) is equal to 30 on average, with an overall standard deviation of 14.2 and a within-individual standard deviation of 9.6. Hence, the bulk (68%) of the overall variation in GHQ-12 is within-individual variation. This is the main source of variation that we exploit for identification, since all our regressions include individual fixed effects (see Section 3 for details). When separately considering the three components of GHQ-12, those related to anxiety and depression and social dysfunction are slightly higher, with a mean (standard deviation) of 30.8 (20.1) and 33.9 (12.7), respectively.[15] The component related to loss of confidence is instead lower, equal to 17.1 (standard deviation of 20.8).

We now move to discussing the import competition shock. Across industries, IC_{jt-1} has a sample mean of 18.3 and a standard deviation of 21.4, which roughly corresponds to the difference between the industry at the 25th percentile of the distribution (6.2%) and the in-

[15]The score on each of the three components of GHQ-12 is obtained by summing over answers to questions pertaining to each clinical dimension (details in Table 1). Each indicator is then rescaled to range between 0 and 100.

Table 3: Descriptive Statistics on Import Competition

Industries with lowest import competition shock	
Manufacture of steam generators, exc. central heating hot water boilers	-51.4
Production of salt	-40.1
Electricity, gas and water supply	-25.7
Water transport	-23.5
Manufacture of wooden containers	-20.4
Industries with highest import competition shock	
Manufacture of pesticides and other agro-chemical products	51.6
Manufacture of prepared animal feeds	55.5
Manufacture of refined petroleoum products	72.9
Manufacture of television, radio transmitters and phone apparatus	82.8
Mining and agglomeration of hard coal	87.3

Notes: The table reports industry-level averages of the import competition shock IC over the period 2001-2007. Source: Eurostat-Comext, UK ONS, and WIOD.

dustry at the 75th percentile (28.9%). Competitive pressure from foreign countries has thus substantially intensified over the period of analysis; there is however a significant degree of heterogeneity across industries. Figure 1 shows the distribution of the average import competition shock across the 122 industries in our sample. As reported in Table 3, some industries (e.g., Mining and agglomeration of hard coal; Manufacture of televisions) have received very large shocks, close to 90% on average. Other industries (e.g., Manufacture of steam generators; Production of salt) have instead experienced a significant reduction in foreign competitive pressure. In our analysis, we will exploit this large variation in IC_{jt-1} to identify the effect of import competition on mental distress.

3 Empirical Specification

We estimate specifications of the following form:

$$MD_{ijt} = \alpha_i + \alpha_j + \alpha_t + \beta_1 IC_{jt-1} + \mathbf{I}_{it-1}\gamma^{'} + \mathbf{H}_{it-1}\delta^{'} + \mathbf{S}_{jt-6}\lambda^{'} + \varepsilon_{ijt}. \quad (1)$$

MD_{ijt} is a proxy for the year t mental distress of worker i, who was employed in industry j in year $t-1$. α_i, α_j, and α_t are individual, industry, and year fixed effects, respectively. IC_{jt-1} is the import competition shock, measured as the change in import competition between $t-6$ and $t-1$, as explained above. $\mathbf{I}_{it-1}$, $\mathbf{H}_{it-1}$, and $\mathbf{S}_{jt-6}$ are vectors of controls

for past individual, household, and industry characteristics, respectively. Finally, ε_{ijt} is an error term.

The vector $\mathbf{I}_{it-1}$ contains log age and its square, an indicator for physical health, and dummies for educational level, marital status, and self-employment.[16] $\mathbf{H}_{it-1}$ includes household size and dummies for household type and home ownership. Taken together, $\mathbf{I}_{it-1}$ and $\mathbf{H}_{it-1}$ allow us to control for standard determinants of mental health at the individual and household level. In addition, to account for cross-industry differences at the moment in which the import competition shock hits, the vector $\mathbf{S}_{jt-6}$ contains the sixth lags of real output, output price, employment share of high-skill workers, value added, and export intensity (exports over output).

The inclusion of individual fixed effects implies that, for identification, we exploit variation in mental distress for the same person over time, while soaking up any time-invariant determinants of mental health. The vectors of control variables allow us to condition the estimation on a large set of time-varying observable characteristics at the individual, household, and industry level. Finally, the industry and time fixed effects absorb, respectively, time-invariant differences across industries and time-specific shocks that are common to all industries. In a nutshell, our identification strategy therefore compares changes in mental distress across similar workers, who live in similar households, and who are employed in similar industries except for the import competition shock.

A concern with the identification of our parameter of interest, β_1, is the possible endogeneity of IC_{jt-1}. Reverse causality should not be an issue in our case, because past changes in an industry's import competition are unlikely to be driven by the current realization of an individual's mental distress. One may however worry about potential omitted variables correlated with both IC_{jt-1} and MD_{ijt}. For instance, a positive domestic de-

[16] See Table 2 for details. The indicator for physical health is based on 11 questions in the BHPS. 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: zero in case of no problem, and one in case of reported problems. It is then rescaled to range between 0 and 100. Specifically, the 11 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.

mand shock may be associated with an improvement in individuals' mental health and simultaneously lead to higher imports. This would induce a downward bias in the OLS estimate of β_1. On the contrary, technological shocks or structural transformation may put some industries on a declining path, simultaneously causing higher distress for workers and greater reliance on foreign imports. This would lead to an upward bias in the OLS estimate of β_1.

The latter concerns are mitigated by the fact that our specification includes industry dummies, year dummies, and a wealth of time-varying controls for individual, household and industry characteristics. In addition, we run instrumental variables (IV) regressions. In particular, we instrument IC_{jt-1} using the 5-year % change in non-UK exports to the rest of the world, i.e., to all countries except the UK. This instrument is meant to isolate variation in UK imports due to exogenous changes in supply conditions in the origin countries, and is similar in spirit to the one originally proposed by Autor et al. (2014) to instrument Chinese imports into the US at the industry-level. Unlike Autor et al. (2014), our analysis considers imports from all the trading partners of the UK and includes service industries as well. In Section 4.1.2, we extensively discuss possible concerns with the exclusion restriction underlying our IV strategy, and provide a number of robustness checks corroborating our baseline results. Moreover, we show that our main evidence is unchanged when using a completely different instrument, which exploits time variation in bilateral exchange rates.

A second concern with the estimation of β_1 is the possibly non-random assignment of workers to industries. This would not be an issue if workers remained in the same industry throughout the sample period. In this case, the individual fixed effects (α_i) would absorb compositional effects due to the non-random assignment of workers to industries. However, some workers in our sample do switch industries (20% on average). Workers' movements may bias the coefficient of interest either upward or downward, depending on whether workers with worse mental conditions systematically switch to industries with higher or lower import competition shocks.

We address sorting concerns in four alternative ways (see Section 4.1.2). First, we use

only the sub-sample of workers who do not switch industry. Second, we focus on workers who are employed in a given industry for at least two consecutive years, and we define a separate fixed effect for each worker-industry combination. This strategy implies that we only exploit variation in mental distress and import competition for a given worker while employed in the same industry. Third, we redefine the import competition shock at the 2-digit (rather than 3-digit) industry level. Using more aggregate data allays concerns with sorting, as individuals move less across broad 2-digit industries than they do across narrow 3-digit industries. Finally, we restrict to the first two consecutive years of employment for each worker and attribute to each individual the import shock of her earliest industry. By construction, this strategy eliminates correlation between mental distress and import competition potentially driven by workers' movements across industries. All these exercises show that workers' sorting has no bearing on our main findings.

4 Results

We now present the empirical results. We start by providing extensive evidence that import competition induces a significant increase in workers' mental distress (Section 4.1). Then, we consider a number of mechanisms through which this effect may take place (Section 4.2).

4.1 Import Competition and Mental Distress

4.1.1 Baseline Estimates

The baseline estimates of eq. (1) are reported in Table 4. We rescale the import competition shock by its overall standard deviation for ease of interpretation. Accordingly, the coefficient β_1 measures the percentage point change in GHQ-12 following a one standard deviation increase in IC_{jt-1}. In column (1), we show OLS estimates of a parsimonious specification, in which GHQ-12 is regressed only on the import competition shock and individual fixed effects (α_i). Standard errors are corrected for clustering both by individual

Table 4: Baseline Estimates

	(1)	(2)	(3)	(4)	(5)
IC	0.217***	0.493***	0.920***	0.729***	0.815***
	[0.014]	[0.129]	[0.193]	[0.122]	[0.136]
Estimator	OLS	2SLS	2SLS	2SLS	2SLS
Individual controls	no	no	yes	yes	yes
Household controls	no	no	yes	yes	yes
Industry controls	no	no	no	no	yes
Individual effects	yes	yes	yes	yes	yes
Industry effects	no	no	no	yes	yes
Year effects	no	no	no	yes	yes
Obs.	50154	50154	48510	48510	48450
R^2	0.52	0.52	0.52	0.53	0.53
First-stage results					
World Exp.	-	0.310***	0.160***	0.250***	0.213***
	-	[0.021]	[0.009]	[0.027]	[0.011]
Kleibergen-Paap F-Statistic	-	222.8	321.9	85.4	412.5

Notes: The dependent variable is GHQ-12, rescaled between 0 and 100. IC is the 5-year % change in import competition (the ratio of imports over apparent consumption) in the industry in which a given worker was employed during the previous year. Individual controls include the first lag of: log age and its square, physical health, and dummies for education level, marital status, and self-employment. Household controls include the first lag of: household size and dummies for household type and home ownership. Industry controls include the sixth lag of real output, output price, employment share of high-skill workers, value added, and export intensity. *World Exp.* is the 5-year % change in non-UK exports to the rest of the world, defined for each worker's past industry of employment. Standard errors are corrected for two-way clustering at the individual and industry level. ***, **, * = indicate significance at the 1, 5 and 10% level, respectively.

and by industry (i.e., two-way clustering), so as to allow for correlation in the error terms both for the same person over time and across individuals employed in the same industry. The coefficient β_1 is positive and very precisely estimated, indicating that a rise in import competition in a worker's industry of employment is associated with an increase in mental distress.

In column (2), we estimate the same specification by Two-Stage Least Squares (2SLS). We instrument IC_{jt-1} using non-UK exports to the rest of the world. In the first-stage regression, the coefficient on the instrument has the expected positive sign, and it is large and very precisely estimated (0.31, s.e. 0.021). At the same time, the second-stage coefficient β_1 remains positive and statistically significant. The slight increase in the coefficient suggests that OLS estimates are downward biased, consistent with there being unobserved shocks correlated with import competition and mental distress in opposite directions. In column

(3), we add our large set of controls for individual and household characteristics ($\mathbf{I}_{it-1}$ and $\mathbf{H}_{it-1}$). The coefficient β_1 remains precisely estimated and is now even larger. Unsurprisingly, this implies that omitting these controls, which are standard determinants of mental distress according to the literature (e.g., Clark, 2003; Dustmann and Fasani, 2016), would turnish the proper identification of the effect of import competition.

In column (4), we add a full set of industry and year effects (α_j and α_t). Our coefficient of interest is largely unchanged. Finally, in column (5) we add the set of time-varying industry controls ($\mathbf{S}_{jt-6}$). Their inclusion leaves our main result unaffected.[17]

Overall, these results indicate that import competition has a positive effect on individuals' mental distress. An individual working in an industry exposed to a stronger increase in foreign competition experiences a larger increase in her mental distress, as compared to a similar individual employed in an industry that witnesses a smaller import competition shock, *ceteris paribus*.

How strong is the effect of import competition? The point estimate in column (5) implies that a one standard deviation increase in IC_{jt-1} leads to a 0.8 p.p. increase in GHQ-12. The latter variable has an overall standard deviation of 14.2 and a within-individual standard deviation of 9.6. Hence, a one standard deviation increase in IC_{jt-1} explains a sizable 5.6% (8.3%) of the overall (within-individual) standard deviation of GHQ-12. As a counterfactual, this effect is roughly equivalent to what would be obtained by moving a worker from the industry at the 25th percentile of the distribution of IC_{jt-1} (6.2%) to the industry at 75th percentile (28.9%).[18] To put our evidence in perspective, this effect is also comparable with that of a one standard deviation increase in crime rates across British local authorities, as estimated by Dustmann and Fasani (2016).

To provide further evidence on the economic magnitude of the effect, we estimate the amount of money that would be needed to compensate a worker for the increase in distress caused by a rise in import competition. To this purpose, we need to map GHQ-12

[17] We have also estimated the most complete specification on the sub-sample of individuals who are always present in the sample. The coefficient is essentially the same (0.837, s.e. 0.158) as when using all the observations (column 5 of Table 4), suggesting that our results are not driven by changes in sample size or attrition.

[18] Recall that IC_{jt-1} has a standard deviation of 21.4% in our sample.

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.[19] EQ-5D is normally used for computing 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 pounds 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 IV specification in column (5) of Table 4, using EQ-5D scores in place of GHQ-12 as the dependent variable. We obtain a coefficient of -0.006 (s.e. 0.001).[20] This indicates that a one standard deviation increase in import competition lowers EQ-5D in one year by 0.6 p.p.. Hence, the individual compensation for this loss amounts to 180 pounds (i.e., 0.006*£30,000) per person in a year. Considering that the total number of persons employed in the UK was equal to 26.9 million in 2007, and that the average import competition shock is 18.3% (86% of a standard deviation), a simple back-of-the-envelope calculation suggests that the total compensation would amount to roughly 4.2 billion pounds (i.e., 0.86*180*26.9), approximately 0.3% of UK GDP.

4.1.2 Robustness Checks

In this section, we submit our baseline estimates to an extensive sensitivity analysis.

Alternative IV strategies The exclusion restriction behind our instrument is that, conditional on the other covariates, changes in non-UK exports to non-UK markets are or-

[19] 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 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.

[20] Note that this coefficient is 25% lower than the coefficient on IC_{jt-1} in the baseline regression for GHQ-12 (see column 5 of Table 4). This is consistent with EQ-5D encompassing a broader concept of health, which also includes dimensions of physical health (see the previous footnote).

Table 5: Robustness Checks

	Coeff.	Std. Err.	Obs.	R^2	KP F-Stat.
a) Alternative IV strategies					
1) Alt. instr.: excl. US and Canada from the importers	0.963***	[0.116]	48450	0.53	576.3
2) Alt. instr.: excl. US and Canada also from the exporters	0.861***	[0.106]	48450	0.53	696.9
3) Excl. industries most correlated with UK GDP	0.807***	[0.135]	46640	0.53	160.1
4) Excl. most energy-intensive industries	0.820***	[0.135]	47237	0.53	355.8
5) Excl. most volatile industries (Autor et al., 2013)	0.836***	[0.114]	47004	0.53	131.0
6) Alt. instr: industry-specific effective exchange rates	1.426***	[0.456]	48450	0.52	20.2
b) Contemporaneous shocks					
7) Year-month dummies	0.827***	[0.134]	48450	0.53	415.4
8) Sector-year dummies: Output growth (2001-2007)	0.694***	[0.175]	48450	0.53	65.7
9) Sector-year dummies: Employment growth (2001-2007)	0.882***	[0.127]	48450	0.53	148.0
10) Sector-year dummies: Material intensity growth (2001-2007)	0.681***	[0.195]	48287	0.53	82.2
11) Sector-year dummies: Capital intensity growth (2001-2007)	1.160***	[0.155]	48274	0.53	1527.3
12) Sector-year dummies: Skill intensity growth (2001-2007)	0.776***	[0.130]	48450	0.53	525.1
13) Sector-year dummies: Labor productivity growth (2001-2007)	0.989***	[0.167]	48450	0.53	521.1
14) 2-digit industry x year dummies	0.987***	[0.115]	48450	0.53	81.6
15) Major occupation x year dummies	1.120***	[0.185]	42173	0.52	268.7
c) Underlying trends based on pre-existing ind. characteristics					
16) Year dummies x initial (2001) import penetration	1.092***	[0.130]	46983	0.53	798.9
17) Year dummies x initial (2001) ind. char.	0.809***	[0.160]	46983	0.53	529.9
18) Year dummies x initial (1998-2000) av. ment. health in the ind.	0.809***	[0.112]	47002	0.53	282.9
19) Year dummies x initial (1998-2000) av. indiv. char. in the ind.	1.211***	[0.323]	47002	0.53	89.7
d) Placebo tests					
20) Dep. var.: Physical health	-0.125*	[0.068]	50679	0.72	446.4
21) Mental health and future import competition	-0.298	[0.253]	42228	0.52	218.4
e) Sorting					
22) Only workers who do not switch industry	0.482***	[0.149]	37435	0.55	266.3
23) Individual-industry fixed effects	0.762***	[0.278]	28752	0.57	226.4
24) IC in the earliest industry of employment	1.017***	[0.184]	15334	0.72	281.2
25) IC at the 2-digit industry level	1.022***	[0.116]	48452	0.52	445.4

Notes: The dependent variable is GHQ-12. Coefficients refer to the import competition shock IC. All regressions include the same controls as in column (5) of Table 4 and are estimated by 2SLS. Standard errors are corrected for two-way clustering at the individual and industry level. ***, **, * = indicate significance at the 1, 5 and 10% level, respectively.

thogonal to industry-specific shocks occurring in the UK. We believe this assumption to be plausible, given that our specification includes a comprehensive set of industry dummies, year dummies, and time-varying controls. Nevertheless, we now show that our main coefficient remains strikingly stable across a large set of alternative IV approaches, which deal with possible remaining correlation between the instrument and the error term. The results are reported in Table 5, panel a).

In row (1), we reconstruct our instrument excluding the US and Canada from the importing countries. These two economies are similar to the UK in various respects, and their business cycle is significantly correlated with that of the UK (Artis et al., 2005). Therefore, higher imports into these markets may be correlated with the error term, if they are triggered by demand shocks correlated with those occurring in the UK. In row (2) we do the

same, but this time we also exclude the US and Canada from the exporting countries. This eliminates the additional concern that US and Canadian exports may be driven by some shocks originating in the UK. In both cases, our main evidence is unchanged, and the coefficient β_1 is remarkably close to the baseline estimate.

Next, we re-estimate our baseline specification excluding industries in which demand or technology shocks are more likely to be correlated across countries. Following Autor et al. (2013) and Colantone and Crinò (2014), the excluded industries are: the industries that are most sensitive to the business cycle, i.e. those characterized by the highest correlation between their own output and UK GDP (row 3);[21] the most energy-intensive industries (row 4);[22] and the industries originally identified by Autor et al. (2013) as having experienced substantial fluctuations over the sample period across countries, due to technological innovations, housing booms, and the rapid growth of emerging economies (row 5).[23] Our coefficient of interest is always positive, significant, and essentially identical to the baseline estimate. Overall, these results corroborate our main identification strategy, which applies to a larger set of industries, and to the universe of UK trading partners, the IV approach originally introduced by Autor et al. (2014) for studying the effects of Chinese import competition on US workers.

In addition, to further verify that our evidence does not crucially hinge on a specific IV strategy, we use an alternative instrument, which exploits variation in effective exchange rates both over time and across industries. We construct this instrument by weighting bilateral exchange rates with each partner country's share in UK imports. These shares are

[21] In particular, we exclude all industries in the following NACE 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).

[22] We exclude all industries in the following NACE 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).

[23] We exclude all industries in the following NACE 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).

computed separately for each industry in 1995 and kept constant throughout. As a result, the instrument varies over time only due to movements in bilateral exchange rates, which are mostly driven by macroeconomic factors. It instead varies across industries only due to pre-sample differences in import shares. Accordingly, this instrument is unlikely to reflect domestic industry-specific shocks and is thus widely used in the empirical literature on the labor market effects of import competition (e.g., Revenga, 1992; Bernard et al., 2006; Cuñat and Guadalupe, 2009). Using this instrument leaves our conclusions unchanged (row 6).

Contemporaneous shocks and underlying trends So far, we have shown that our estimates are robust to alternative instrumentation approaches. In this section, we estimate a number of very demanding specifications, which are obtained by augmenting our baseline IV regression (column 5 of Table 4) with large sets of fixed effects and time trends. These are meant to absorb remaining contemporaneous shocks and underlying trends, thereby further raising confidence in the validity of the exclusion restriction. The results are in Table 5, panels b) and c).

We start, in row (7), by replacing the year dummies with a full set of year-month dummies. In the BHPS, individuals are interviewed in different months. Given that mental health responds to seasonal factors such as the weather (e.g., Connolly, 2013), one may be concerned that our results are partly driven by the staggered timing of interviews in the BHPS. However, the inclusion of year-month dummies leaves our coefficient of interest unchanged.

Next, we include additional controls for contemporaneous shocks at the industry level. Following Colantone and Crinò (2014), in rows (8)-(13) we divide industries into five bins of equal size, based on the observed change over the sample period in the variable indicated in each row. Then, we augment our baseline specification by including a full set of interactions between the year dummies and dummies for all bins. The idea is that industries that have experienced different changes in a given observable characteristic may have also been exposed to different shocks. These interactions soak up all time-varying differences across industries belonging to different bins. Accordingly, identification now only

comes from the remaining variation in import competition across industries belonging to the same bin, which are relatively homogeneous. In a similar vein, in rows (14) and (15) we include full sets of interactions between the year dummies and either 2-digit industry dummies or major occupation dummies. These interactions absorb shocks that hit all narrowly defined industries belonging to the same aggregate industry, or all minor occupations belonging to the same major occupational category. Strikingly, our evidence is unchanged across the board.

In rows (16)-(19), we extend the specification to allow for heterogeneous trends based on pre-existing industry characteristics. In particular, we augment our baseline regression by adding a full set of interactions between the year dummies and the initial value of the industry variables indicated in each row. In all cases, our main evidence is unaffected.

Placebo tests We now perform two placebo tests to further show that our results do not reflect underlying factors correlated with general health and import competition. The results are in Table 5, panel d). In row (20), the dependent variable is our indicator of physical health rather than GHQ-12. The coefficient on import competition is negative, small and not very precisely estimated. Note that higher values of the physical health index indicate *worse* health conditions. Hence, this first placebo test suggests that our results are unlikely to reflect underlying factors that are positively correlated with both import competition and general health problems of individuals. In row (21) we instead regress current mental health on future values of the import competition shock. In particular, we use observations on mental health between 1994 and 2001, and regress GHQ-12 at time t on the import competition shock evaluated between $t+1$ and $t+6$, thereby exploiting all our trade data between 1995 and 2007. The estimated coefficient is small and not statistically significant, which further indicates that our results are not picking up common trends in imports and mental distress.

Sorting In panel e) of Table 5, we address concerns with the sorting of individuals across industries. As mentioned in Section 3, we use four complementary approaches. In row

(22), we re-estimate our main specification on the sub-sample of workers who do not switch industry in any given year. In row (23), we focus on individuals who stay in the same industry for two or more consecutive years, and add a different fixed effect for each individual-industry combination. Hence, the coefficient β_1 is identified from variation in mental distress and import competition for a given worker while employed in the same industry. In row (24), we restrict to the first two consecutive years of employment for each worker and attribute to each individual the import shock of her earliest industry. This gets rid of any correlation between mental distress and import competition due to the movement of workers across industries. Finally, in row (25) we compute the import competition shock at the more aggregate 2-digit industry level, rather than at the 3-digit level as in all other specifications. The reason is that most of the switches in our sample occur across 3-digit industries within the same 2-digit aggregate industry. Our coefficient of interest remains always positive and very precisely estimated. This suggests that the sorting of individuals across industries is not driving our main evidence.

Alternative proxies for import competition and mental distress In panel a) of Table 6, we test the robustness of our baseline evidence to the use of alternative proxies for import competition. Although our import penetration indicator is widely used in the international trade literature, one may be concerned that its variation does not mainly reflect changes in imports (the numerator) but mostly comes from changes in apparent consumption (the denominator, defined as production plus imports minus exports), due to the dynamics of exports or domestic production. To address this concern, we re-construct IC_{jt-1} by normalizing imports using domestic production only (row 1) and a completely different denominator given by the number of employees (row 2). Reassuringly, the coefficients are essentially identical to the baseline estimates.

Next, we consider the role of net imports, i.e., imports minus exports. In this case, we re-construct IC_{jt-1} as the 5-year % change in net imports divided by either domestic production (row 3) or employment (row 4). Our evidence is unaffected. Interestingly, the size of the coefficient β_1 is somewhat reduced, suggesting that increases in exports may also

Table 6: Alternative Proxies

	Coeff.	Std. Err.	Obs.	R^2	KP F-Stat.
a) Alternative proxies for import competition					
1) Imports over domestic production	0.841***	[0.141]	48452	0.53	447.9
2) Imports over employment	0.863***	[0.152]	48481	0.53	47.70
3) Net imports over domestic production	0.367***	[0.088]	48452	0.53	113.0
4) Net imports over employment	0.372***	[0.090]	48481	0.53	109.3
b) Alternative proxies for mental distress					
5) GHQ-12 (Caseness score)	0.983***	[0.262]	48450	0.48	412.5
6) GHQ-12 (Able to concentrate on whatever you're doing?)	1.077***	[0.204]	48450	0.35	412.5
7) GHQ-12 (Lost much sleep over worry?)	0.340*	[0.181]	48450	0.50	412.5
8) GHQ-12 (Felt that you were playing a useful part in things?)	0.986***	[0.142]	48450	0.36	412.5
9) GHQ-12 (Felt capable of making decisions about things?)	0.932***	[0.223]	48450	0.37	412.5
10) GHQ-12 (Felt constantly under strain?)	0.466**	[0.213]	48450	0.49	412.5
11) GHQ-12 (Felt you couldn't overcome your difficulties?)	0.513**	[0.226]	48450	0.48	412.5
12) GHQ-12 (Able to enjoy your normal day-to-day activities?)	1.131***	[0.222]	48450	0.35	412.5
13) GHQ-12 (Able to face up to problems?)	1.013***	[0.168]	48450	0.36	412.5
14) GHQ-12 (Feeling unhappy or depressed?)	1.602***	[0.248]	48450	0.49	412.5
15) GHQ-12 (Losing confidence in yourself?)	-0.274	[0.377]	48450	0.54	412.5
16) GHQ-12 (Thinking of yourself as a worthless person?)	0.937***	[0.229]	48450	0.55	412.5
17) GHQ-12 (Feeling reasonably happy, all things considered?)	1.057***	[0.206]	48450	0.37	412.5
18) Dummy for GHQ-12 (Likert score) above 12	0.028***	[0.005]	48450	0.48	412.5
19) Dummy for GHQ-12 (Caseness score) above 2	0.012**	[0.005]	48450	0.44	412.5

Notes: Panel a) uses different proxies for the import competition shock IC, as indicated in each row. In panel b), the dependent variables are indicated in each row and, except for rows (18) and (19), are rescaled between 0 and 100. All coefficients refer to the variable IC. All regressions include the same controls as in column (5) of Table 4 and are estimated by 2SLS. Standard errors are corrected for two-way clustering at the individual and industry level. ***, **, * = indicate significance at the 1, 5 and 10% level, respectively.

have adverse effects on health, in line with Hummels et al. (2016). Overall, the above results imply that our evidence captures a specific effect of import pressure on mental distress, which is distinct from those of other trade-related industry dynamics.

In panel b) of Table 6, we finally show that our results are robust to the use of alternative measures of mental health. In row (5), we use the Caseness version of GHQ-12. The estimated coefficient is very close to our baseline estimate. In rows (6)-(17), we use as dependent variables the twelve individual components of GHQ-12. All coefficients but one are positive and statistically significant, suggesting that our results are not driven by just a few components of mental distress.

Finally, we benchmark GHQ-12 scores against critical thresholds, which have been identified in the health literature as signals of psychiatric disorder, and are normally used by clinicians for screening purposes (e.g., Easton and Turner, 1991; Goldberg et al., 1997). These thresholds equal 12 for the 0-36 version of GHQ-12 (Likert scoring method) and 2 for the 0-12 version (Caseness scoring method). In our case, adopting these values is also

equivalent to defining in-sample thresholds equal to the mean of the two GHQ-12 indexes, as part of the health literature would suggest (e.g., Goldberg et al., 1997). We construct dummies equal to 1 if a given GHQ-12 index is above the corresponding threshold, and zero otherwise. In rows (18) and (19), we use these dummies as dependent variables. The coefficient on IC_{jt-1} is positive and significant in both cases. This implies that import competition not only raises mental distress at large, but also increases the probability that individuals develop clinically relevant mental disorder. Consistent with this evidence, aggregate statistics show that, in parallel with the strong increase in import competition documented in Section 2.4, the number of adults who have used public mental health services has sharply increased in the UK, passing from 1.07 million in 2003 (the first period with available data) to 1.2 million in 2007 (source: Health and Social Care Data Center).

4.1.3 Heterogeneity

In Table 7, we study how the effect of import competition varies across individuals with different characteristics. To this purpose, we interact IC_{jt-1} with dummies for males, self-employed workers, old individuals (above 50 years of age), long-tenure workers (more than 10 years in the same job), permanent and full-time employees. We instrument each interaction with the interaction between our instrument and the corresponding dummy.

Considering the richest specification in column (7), we find no statistically significant differences across individuals of different gender and age, nor across full-time and part-time employees or across permanent and temporary workers. Overall, this suggests that the impact of import competition on mental health is relatively homogeneous across different groups of individuals. We instead find negative and significant interactions for long-tenure and self-employed workers. This is consistent with these individuals typically having a stronger attachment to their firms and being more likely to operate in low tradable jobs that are less exposed to foreign competition.

Table 7: Heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IC	0.772***	0.820***	1.109***	1.257***	0.871**	1.061***	0.760**
	[0.129]	[0.138]	[0.187]	[0.138]	[0.325]	[0.122]	[0.291]
IC * Male	0.094						-0.014
	[0.114]						[0.137]
IC * Self-employed		-1.341***					-5.854***
		[0.417]					[0.712]
IC * Over 50			-0.974**				-0.423
			[0.353]				[0.357]
IC * Long tenure				-0.778**			-0.763**
				[0.293]			[0.304]
IC * Permanent					-0.112		0.657
					[0.368]		[0.444]
IC * Full Time						-0.383***	-0.182
						[0.106]	[0.182]
Dummy over 50			0.658*				0.510**
			[0.326]				[0.205]
Dummy long tenure				1.234***			1.195***
				[0.157]			[0.167]
Dummy permanent					1.360***		1.074***
					[0.148]		[0.183]
Dummy full time						1.051***	0.731***
						[0.107]	[0.134]
Obs.	48450	48450	48449	40018	48447	48018	39777
R^2	0.53	0.53	0.53	0.52	0.53	0.53	0.52
Kleibergen-Paap F-Statistic	148.8	477.3	221.1	196.6	212.2	181.6	58.3

Notes: The dependent variable is GHQ-12. All regressions include the same controls as in column (5) of Table 4 and are estimated by 2SLS. Standard errors are corrected for two-way clustering at the individual and industry level. ***, **, * = indicate significance at the 1, 5 and 10% level, respectively.

4.2 Mechanisms

Having shown that import competition has a positive effect on individuals' mental distress, we now exploit the unique richness of our data set to provide evidence on some of the mechanisms through which this effect may occur, in line with the economic literature on the determinants of mental distress. To this purpose we run regressions of: (1) mental distress on proxies for each mechanism; and (2) each of these proxies on import competition. While we cannot make claims regarding causality, these results nevertheless enrich our main evidence by hinting at a number of possible explanations. The regression results of step (1) are reported in Table 8, and those of step (2) in Table 9. We first discuss the association between mental distress and the proxies for the different mechanisms (Table 8). Then, we study how each of these proxies correlates with import competition (Table 9).

As a first mechanism, we analyze the role of job switching. Specifically, we focus on

three mutually exclusive groups of switchers, corresponding to workers who in a given year move, respectively, out of employment, to other industries, and to other jobs within the same industry. We start by regressing GHQ-12 on three dummy variables capturing each type of switching, plus all the controls included in our baseline specification (see column 5 of Table 4). The results are in column (1) of Table 8. We find switching out of employment to be strongly positively correlated with mental distress, consistent with previous studies (see, in particular, Clark, 2003; Black et al., 2015; Farrè et al., 2015). At the same time, changing industry or job within the same industry is associated with a reduction in mental distress. Next, we regress each of the three dummies for switching on IC_{jt-1} and the whole set of controls. The results are in columns (1)-(3) of Table 9.[24] We find little evidence of a correlation between import competition and the likelihood of changing industry or job within the same industry. Instead, consistent with the empirical trade literature (e.g., Autor et al., 2013, 2014, 2016a), we find a statistically significant and positive correlation between import competition and the probability of leaving employment. Overall, these results jointly suggest that a first mechanism through which import competition may affect mental distress is by increasing the risk of job displacement.

Next, we provide evidence that the effects of import competition are not contained to displaced workers, but extend to the wider population of continuously employed individuals. One mechanism through which this may happen is related to wage changes. In column (2) of Table 8, we regress GHQ-12 on the yearly percentage change in each worker's gross wage, along with all the usual controls plus the two dummies for switching between and within industries, since wage changes may partly reflect job changes. This regression therefore captures the correlation between mental distress and wage growth, conditional on job status. The results imply that lower wage growth is strongly associated with higher mental distress.[25] In the second step, we regress wage growth on IC_{jt-1}, plus the dummies

[24] The number of observations drops as we move across columns, since each specification is estimated on a sub-sample of the workers used in the preceding one. In particular, the regression in column (2) uses only the sub-sample of workers who remain employed, thus excluding those who switch out of employment. Similarly, the regression in column (3) focuses on the sub-sample of workers who remain employed and stay within the same industry, thus excluding workers who switch out of employment or change industry.

[25] See also Ettner (1996) and McInerney et al. (2013) on the effects of income changes on health.

for job switching and all the usual controls. As shown in column (4) of Table 9, the coefficient on import competition is negative and statistically significant. Hence, these results suggest that import competition may raise the mental distress of non-displaced workers by flattening their wage profile.

So far, our findings suggest that, by worsening mental distress, import competition exposes workers to additional adjustment costs, on top of the monetary losses entailed by unemployment spells and lower wage growth. These additional costs are not reflected in observable labor market statistics, and have not been considered in previous studies on the labor market effects of import competition. As a result, the literature may have underestimated the distributional consequences of globalization.

In addition, we now show that import shocks may also affect non-displaced workers conditional on wage growth. The consequences of globalization for people who experience no changes in observable labor market outcomes have been largely overlooked until now. By providing evidence that import competition may also affect the mental health of these individuals, we therefore warn that trade integration may have distributional effects that are more widely spread and pervasive than usually thought.

One mechanism that we consider is job satisfaction. To investigate this channel, in column (3) of Table 8 we regress GHQ-12 on a dummy equal to 1 if the individual declares to be completely satisfied with her job. We control for wage growth and the job switching dummies, so as to condition on the observable labor market outcomes considered before. The results show that a reduction in job satisfaction is associated with a significant increase in mental distress. Then, we regress the dummy for job satisfaction on IC_{jt-1}, controlling for wage growth, the job switching dummies, and all the other covariates. The results, reported in column (5) of Table 9, show that import competition is significantly associated with a reduction in job satisfaction. Overall, these results suggest that import competition may worsen the mental distress of non-displaced workers, even after conditioning on wage growth, by making these individuals less satisfied with the current job.

Table 8: Mechanisms - GHQ-12 and Determinants of Mental Health

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Switch out of employment	2.304***	-	-	-	-	-	-	-	-
	[0.320]	-	-	-	-	-	-	-	-
Switch to a different industry	-1.039***	-0.794***	-0.549***	-1.410***	-1.005**	-0.865***	-1.612***	-0.618***	-0.465***
	[0.111]	[0.103]	[0.164]	[0.433]	[0.458]	[0.221]	[0.221]	[0.196]	[0.156]
Switch to another job in the same industry	-0.313***	-0.239**	-0.256**	-0.839**	-0.741***	-0.375	-0.964***	-0.290**	-0.297**
	[0.105]	[0.102]	[0.116]	[0.404]	[0.224]	[0.273]	[0.194]	[0.119]	[0.115]
Wage growth		-0.812***	-0.508***	0.277	-0.059	-0.148	0.147	-0.449***	-0.534***
		[0.088]	[0.087]	[0.315]	[0.197]	[0.379]	[0.212]	[0.097]	[0.091]
Job satisfaction: overall			-6.836***					-6.738***	-6.753***
			[0.181]					[0.187]	[0.153]
Job satisfaction: total pay				-2.844***					
				[0.497]					
Job satisfaction: job security					-3.657***				
					[0.662]				
Job satisfaction: actual work itself						-7.016***			
						[0.345]			
Job satisfaction: workload							-4.527***		
							[0.230]		
Expectations: job promotion								-0.803***	
								[0.201]	
Expectations: financial									-0.266**
									[0.107]
Individual controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Household controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Individual effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Obs.	43,353	34840	29477	4137	8985	6147	6201	27865	28613
R^2	0.53	0.53	0.57	0.64	0.62	0.65	0.66	0.58	0.57

Notes: The dependent variable is GHQ-12, rescaled between 0 and 100. All regressions include the same controls as in column (5) of Table 4 and are estimated by OLS. Standard errors are corrected for two-way clustering at the individual and industry level. ***, **, * = indicate significance at the 1, 5 and 10% level, respectively.

Table 9: Mechanisms - Determinants of Mental Health and Import Competition

Dep. Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Dummy for switching			Wage growth	Job satisfaction					Expectations	
	Out of empl.	Oth. ind.	Oth. job		Overall	Tot. Pay	Job Secur.	Work Itself	Workload	Job Prom.	Financial
IC	0.001**	0.002	0.004	-0.002**	-0.008***	-0.006*	-0.008***	0.000	-0.007***	-0.003**	-0.004**
	[0.001]	[0.001]	[0.002]	[0.001]	[0.001]	[0.003]	[0.002]	[0.003]	[0.002]	[0.001]	[0.002]
Switch diff. ind.				0.006	0.055***	0.026***	0.009	0.079***	0.038***	0.017***	0.028***
				[0.004]	[0.005]	[0.006]	[0.006]	[0.009]	[0.007]	[0.004]	[0.004]
Switch oth. job same ind.				0.012***	0.020***	0.006	-0.001	0.029***	0.009*	-0.003	0.004
				[0.002]	[0.006]	[0.006]	[0.006]	[0.006]	[0.005]	[0.003]	[0.009]
Wage growth					0.045***	0.045***	0.018***	0.001	-0.019***	-0.001	-0.013**
					[0.004]	[0.006]	[0.004]	[0.005]	[0.005]	[0.004]	[0.006]
Job sat.: overall										0.049***	0.006
										[0.004]	[0.004]
Individual controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Household controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Individual effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Obs.	50,677	47,041	30,940	35124	29450	4180	9078	6228	6254	27837	28585
R^2	0.34	0.44	0.45	0.15	0.50	0.86	0.78	0.82	0.83	0.46	0.46

Notes: The dependent variables are indicated in columns' headings. All regressions include the same controls as in column (5) of Table 4 and are estimated by OLS. Standard errors are corrected for two-way clustering at the individual and industry level. ***, **, * = indicate significance at the 1, 5 and 10% level, respectively.

Our data allow us to probe deeper into the reasons why import competition is associated with lower job satisfaction. In particular, the BHPS inquires individuals on four main determinants of job satisfaction: total pay, job security, actual work itself, and workload (hours worked). While coverage is not as good as for the aggregate job satisfaction variable, we exploit the available information to construct four dummies, which are equal to 1 if the individual declares to be completely satisfied with a given dimension. In columns (4)-(7) of Table 8, we find that all of these dummies are negatively correlated with GHQ-12, implying that a reduction in any dimension of job satisfaction is associated with greater mental distress. In the second step, performed in columns (6)-(9) of Table 9, we regress the four dummies on IC_{jt-1} and all the variables used in column (5) of the same table. Interestingly, the results show that import competition is not accompanied by a deterioration of workers' satisfaction with the actual work itself, i.e., with the very content of the job. Instead, import competition is associated with reduced satisfaction with the working conditions, in terms of total pay, job security, and workload.[26] In other words, non-displaced workers perceive their jobs as becoming less remunerative, more unstable, and more demanding. Overall, this suggests that firms pass on to their employees part of the increased competitive pressure from trade.

Finally, another mechanism that we consider is related to expectations. We exploit two questions contained in the BHPS. The first asks each individual whether she expects a job promotion with her current employer over the next year.[27] We construct a dummy variable taking the value 1 in case of a positive answer. The second question is about financial expectations. Specifically, we use a dummy equal to 1 if the individual expects that her personal financial situation will be better next year compared to the current year. In columns (8) and (9) of Table 8, we regress GHQ-12 on each of these dummies for future expectations. We include all our controls for job switching, wage growth, and job satisfaction. We

[26] In unreported regressions, we have used the information on the total number of hours worked reported in the BHPS. When regressing the yearly percentage change in this variable on import competition, we have found a positive and significant coefficient (0.062, s.e. 0.010), which confirms that import competition is associated with firms switching to longer and more demanding working schedules.

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

find better expectations to be associated with lower mental distress. In the second step, reported in columns (10) and (11) of Table 9, we regress the expectation dummies on import competition and all the controls. We obtain negative and significant coefficients. Such evidence suggests that import competition is associated with worsened expectations about the future, which in turn are related to higher mental distress.

It is likely that the worsening of job prospects and financial expectations gets reflected into observable changes in individuals' behavior. In particular, individuals may decide to save more for precautionary motives and to change their consumption behavior accordingly. In unreported specifications, we have used the information about consumption and saving contained in the BHPS to study how import competition is related to these decisions. In particular, we have regressed the percentage change in monthly saving on import competition and all the control variables used in columns (10) and (11) of Table 9. The coefficient on import competition turned out to be positive and statistically significant (0.030, s.e. 0.006), indicating that an increase in import competition is indeed associated with more saving. Consistent with this result, we have also found import competition to be associated with fewer purchases of durables, as measured by the sum of 12 dummies equal to 1 if the individual has purchased a given durable good during the year (coefficient of -0.012, s.e. 0.004).[28]

To sum up, this section suggests that import competition may increase individuals' mental distress through four different mechanisms: (1) an increase in the probability of job displacement; and, for non-displaced workers, (2) lower wage growth, (3) reduced job satisfaction, and (4) worsened expectations about the future. How much of the overall effect of import competition on mental distress is mediated through these channels? In order to answer this question, we have estimated a system of equations allowing to simultaneously account for the role of all mediators. In the spirit of the traditional mediation analysis (e.g., Sobel, 1982; Baron and Kenny, 1986), this methodology essentially compares the coefficient on import competition in a regression without mediators, to the one obtained in

[28]The 12 durable goods considered are: color TV, video recorder, satellite dish, fridge freezer, washing machine, tumble drier, dish washer, microwave oven, home computer, cable TV, compact disc player, telephone.

a regression where mediators are added. The dependent variable is GHQ-12 in both cases. The results suggest that the identified mechanisms mediate a non-negligible 25% of the overall effect of import competition on mental distress.

5 Conclusion

We have studied the effect of import competition on mental distress, using a unique data set that combines individual-level information on the mental health of British workers with industry-level information on import competition, for more than 100 industries over 1995-2007. Our results show that import competition has a strong positive effect on mental distress, and suggest that this effect may take place through a complex set of mechanisms, including job displacement, lower wage growth, reduced job satisfaction, and worsened expectations about the future.

Overall, our evidence points to the existence of new adjustment costs of import competition. These additional costs tend to exacerbate the distributional consequences of foreign competitive pressure, and make its adverse effects more widespread and pervasive in society than usually thought. This may help explaining the rising concerns with globalization, and the increased support for protectionist and nationalist parties, recently observed in developed countries. Our results also add to the important debate on the optimal design of trade adjustment and unemployment schemes (see, e.g., Michelacci and Ruffo, 2015). In particular, they suggest that future trade liberalization agreements should be accompanied by an expansion of public programs that support trade-exposed workers (e.g., the Trade Adjustment Assistance in the US and the European Globalisation Adjustment Fund) and by an increased emphasis of such programs on health-related aspects.

References

[1] Acemoglu, D., 2002, 'Directed Technical Change,' *Review of Economic Studies*, 69, pp. 781-809.

[2] Acemoglu, D., D. Autor, D. Dorn, G. Hanson and B. Price, 2016, 'Import Competition and the Great U.S. Employment Sag of the 2000s,' *Journal of Labor Economics*, 34, pp. 141-198.

[3] Adda, J. and Y. Fawaz, 2017, 'Trade-Induced Mortality,' *Mimeo*, Bocconi University.

[4] Artis, M., M. Marcellino and T. Proietti, 2005, 'Dating the Euro Area Business Cycle,' in Reichlin, L. (ed.), *The Euro Area Business Cycle: Stylized Facts and Measurement Issues*, CEPR.

[5] Autor, D., D. Dorn and G. Hanson, 2013, 'The China Syndrome: Local Labor Market Effects of Import Competition in the United States,' *American Economic Review*, 103, pp. 2121-2168.

[6] Autor, D., D. Dorn and G. Hanson, 2014, 'Trade Adjustment: Worker Level Evidence,' *Quarterly Journal of Economics*, 129, pp. 1799-1860.

[7] Autor, D., D. Dorn and G. Hanson, 2015, 'Untangling Trade and Technology: Evidence from Local Labor Markets,' *Economic Journal*, 125, pp. 621-646.

[8] Autor, D., D. Dorn and G. Hanson, 2016a, 'The China Shock: Learning from Labor Market Adjustment to Large Changes in Trade,' *Annual Review of Economics*, 8, pp. 205-240.

[9] Autor, D., D. Dorn and G. Hanson, 2017, 'When Work Disappears: Manufacturing Decline and the Falling Marriage-Market Value of Men,' *NBER Working Paper 23173*.

[10] Autor, D., D. Dorn, G. Hanson and K. Majlesi, 2016b, 'Importing Political Polarization? The Electoral Consequences of Rising Trade Exposure,' *NBER Working Paper 22637*.

[11] Autor, D., D. Dorn, G. Hanson, G. Pisano and P. Shu, 2016c, 'Foreign Competition and Domestic Innovation: Evidence from U.S. Patents,' *NBER Working Paper 22879*.

[12] Baron, R.M. and D.A. Kenny, 1986, 'The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations,' *Journal of Personality and Social Psychology*, 51, pp. 1173-1182.

[13] Bernard, A., J. Jensen and P. Schott, 2006, 'Survival of the Best Fit: Exposure to Low-Wage Countries and the (Uneven) Growth of U.S. Manufacturing Plants,' *Journal of International Economics*, 68, pp. 219-237.

[14] Black, S.E., P.J. Devereux and K.G. Salvanes, 2015, 'Losing Heart? The Effect of Job Displacement on Health,' *Industrial and Labor Relations Review*, 68, pp. 833-861.

[15] Bloom, N., M. Draca and J. Van Reenen, 2016, 'Trade-Induced Technical Change: The Impact of Chinese Imports on Innovation, IT and Productivity,' *Review of Economic Studies*, 83, pp. 87-117.

[16] Böckerman, P. and M. Maliranta, 2013, 'Outsourcing, Occupational Restructuring, and Employee Well-Being: Is There a Silver Lining?' *Industrial Relations*, 52, pp. 878-914.

[17] Bombardini, M. and B. Li, 2016, 'Trade, Pollution and Mortality in China,' *NBER Working Paper 22804*.

[18] Che, Y., Y. Lu, J.R. Pierce, P.K. Schott and Z. Tao, 2016, 'Does Trade Liberalization with China Influence US Elections?' *NBER Working Paper 22178*.

[19] Cheng, G.H.L. and D.K.S. Chan, 2008, 'Who Suffers more from Job Insecurity? A Meta-Analytic Review,' *Applied Psychology*, 57, pp. 272-303.

[20] Clark, A., 2003, 'Unemployment as a Social Norm: Psychological Evidence from Panel Data,' *Journal of Labor Economics*, 21, pp. 323-351.

[21] Clark, A.E. and A.J. Oswald, 1994, 'Unhappiness and Unemployment,' *Economic Journal*, 104, pp. 648-659.

[22] Colantone, I. and R. Crinò, 2014, 'New Imported Inputs, New Domestic Products,' *Journal of International Economics*, 92, pp. 147-165.

[23] Colantone, I. and P. Stanig, 2016a, 'Global Competition and Brexit,' *Mimeo*, Bocconi University.

[24] Colantone, I. and P. Stanig, 2016b, 'The Trade Origins of Nationalist Protectionism: Import Competition and Voting Behavior in Western Europe,' *Mimeo*, Bocconi University.

[25] Connolly, M., 2013, 'Some Like It Mild and Not Too Wet: The Influence of Weather on Subjective Well-Being,' *Journal of Happines Studies*, 14, pp. 457-473.

[26] Cornaglia, F., A. Leigh and N. Feldman, 2014, 'Crime and Mental Wellbeing,' *Journal of Human Resources*, 49, pp. 110-140.

[27] Cuñat, V. and M. Guadalupe, 2009, 'Globalization and the Provision of Incentives Inside the Firm: The Effect of Import Competition,' *Journal of Labor Economics*, 27, pp. 179212.

[28] Dauth, W., S. Findeisen and J. Suedekum, 2014, 'The Rise of the East and the Far East: German Labor Markets and Trade Integration,' *Journal of the European Economic Association*, 12, pp. 1643-1675.

[29] Dix-Carneiro, R., R.R. Soares and G. Ulyssea, 2017, 'Local Labor Market Conditions and Crime: Evidence from the Brazilian Trade Liberalization, *Mimeo*, Duke University.

[30] Dustmann, C. and F. Fasani, 2016, 'The Effect of Local Area Crime on Mental Health,' *Economic Journal*, 126, pp. 978-1017.

[31] Easton, J.A. and S.W. Turner, 1991, 'Detention of British Citizens as Hostages in the Gulf: Health, Psychological, and Family Consequences,' *British Medical Journal*, 303, pp. 1231-1234.

[32] Ettner, S.L., 1996, 'New Evidence on the Relationship between Income and Health,' *Journal of Health Economics*, 15, pp. 67-85.

[33] Farrè, L., F. Fasani and H. Mueller, 2015, 'Feeling Useless: The Effect of Unemployment on Mental Health in the Great Recession,' *IZA Discussion Paper 9235*.

[34] Feler, L. and M.Z. Senses, 2016, 'Trade Shocks and the Provision of Local Public Goods,' *IZA Discussion Paper 10231*.

[35] Giuntella, O. and F. Mazzonna, 2015, 'Do Immigrants Improve the Health of Natives?' *Journal of Health Economics*, 43, pp. 140-153.

[36] Giuntella O., F. Mazzonna, C. Nicodemo and C. Vargas Silva, 2016, 'Immigration and the Reallocation of Work Health Risk,' *IZA Discussion Paper 10304*.

[37] Goldberg, D., 1978, *Manual of the General Health Questionnaire*, Windsor: National Foundation.

[38] Goldberg D., R. Gater, N. Sartorius, T.B. Ustun, M. Piccinelli, O. Gureje, C. Rutter, 1997, 'The Validity of Two Versions of the GHQ in the WHO Study of Mental Illness in General Health Care,' *Psychological Medicine*, 27, pp. 191-197.

[39] Graetz, B., 1991, 'Multidimensional Properties of the General Health Questionnaire,' *Social Psychiatry and Psychiatric Epidemiology*, 26, pp. 132-138.

[40] Hu, Y., S. Stewart-Brown, L. Twigg and S. Weich, 2007, 'Can the 12-Item General Health Questionnaire be Used to Measure Positive Mental Health?' *Psychological Medicine*, 37, pp. 1005-1013.

[41] Hummels, D., J. Munch and C. Xiang, 2016, 'No Pain, No Gain: The Effects of Exports on Job Injury and Sickness,' *NBER Working Paper 22365*.

[42] Iossa, E. and P. Sacco, 2017, 'Contract Design when Effort-Reward Imbalance Causes Stress,' *Mimeo*, University of Rome Tor Vergata.

[43] Lang, Matthew, T.C. McManus and G. Schaur, 2016, 'The Effects of Import Competition on Health in the Local Economy', *Mimeo*, Xavier University.

[44] MacKerron, G., 2012, 'Happiness Economics from 35 000 Feet,' *Journal of Economic Surveys*, 26, pp. 705-735.

[45] Marcus, J., 2013, 'The Effect of Unemployment on the Mental Health of Spouses - Evidence from Plant Closures in Germany,' *Journal of Health Economics*, 32, pp. 546-558.

[46] McCabe, C.J., K.J. Thomas, J.E. Brazier, P. Coleman, 1996, 'Measuring the Mental Health Status of a Population: A Comparison of the GHQ-12 and the SF-36 (MHI-5),' *British Journal of Psychiatry*, 169, pp. 517521.

[47] McCabe, C.J., K. Claxton and A.J. Culyer, 2008, 'The NICE Cost-Effectiveness Treshold,' *Pharmacoeconomics*, 26, pp. 733-744.

[48] McInerney, M., J. Mellor and L. Nicholas, 2013, 'Recession Depression: Mental Health Effects of the 2008 Stock Market Crash,' *Journal of Health Economics*, 32, pp. 1090-1104.

[49] McManus, T.C. and G. Schaur, 2016, 'The Effects of Import Competition on Worker Health', *Journal of International Economics*, 102, pp. 160-172.

[50] Michelacci, C. and D. Lopez-Salido, 2007, 'Technology Shocks and Job Flows,' *Review of Economic Studies*, 74, pp. 1195-1227.

[51] Michelacci, C. and H. Ruffo, 2015, 'Optimal Life Cycle Unemployment Insurance,' *American Economic Review*, 105, pp. 816-859.

[52] OECD, 2014, 'Mental Health and Work: United Kingdom', OECD Publishing, Paris.

[53] OECD, 2015, 'Fit Mind, Fit Job: From Evidence to Practice in Mental Health and Work', OECD Publishing, Paris.

[54] Oswald, A.J. and N. Powdthavee, 2008, 'Does Happiness Adapt? A Longitudinal Study of Disability with Implications for Economists and Judges,' *Journal of Public Economics*, 92, pp. 1061-1077.

[55] Politi, P.L., M. Piccinelli and G. Wilkinson, 1994, 'Reliability, Validity and Factor Structure of the 12Item General Health Questionnaire among Young Males in Italy,' *Acta Psychiatrica Scandinavica*, 90, pp. 432-437.

[56] Pierce, J.R. and P.K. Schott, 2016a, 'The Surprisingly Swift Decline of US Manufacturing Employment,' *American Economic Review*, 106, pp. 1632-1662.

[57] Pierce, J.R. and P.K. Schott, 2016b, 'Trade Liberalization and Mortality: Evidence from U.S. Counties,' *mimeo*, Yale School of Management.

[58] Revenga, A.L., 1992, 'Exporting Jobs? The Impact of Import Competition on Employment and Wages in U.S. Manufacturing,' *Quarterly Journal of Economics*, 107, pp. 255-284.

[59] Ruhm, C., 2000, 'Are Recessions Good for Your Health?,' *Quarterly Journal of Economics*, 115, pp. 617-650.

[60] Serrano-Aguilar, P., Ramallo Fariña, Y., Del Mar Trujillo-Martin, M., Munoz-Navarro, S.R., Perestelo Perez, L. and C. De Las Cuevas-Castresana, 2009, 'The Relationship among Mental Health Status (GHQ-12), Health Related Quality of Life (EQ-5D) and Health-State Utilities in a General Population,' *Epidemiology and Psychiatric Sciences*, 18, pp. 229-239.

[61] Sobel, M.E., 1982, 'Asymptotic Confidence Intervals for Indirect Effects in Structural Equation Models,' *Sociological Methodology*, 13, pp. 290-312.

[62] Sullivan, D. and T. von Wachter, 2009, 'Job Displacement and Mortality: An Analysis Using Administrative Data,' *Quarterly Journal of Economics*, 124, pp. 1265-1306.

[63] Sverke, M., J. Hellgren and K. Nswall, 2002, 'No Security: A Meta-Analysis and Review of Job Insecurity and its Consequences,' *Journal of Occupational Health Psychology*, 7, pp. 242-264.

[64] Timmer, M.P., E. Dietzenbacher, B. Los, R. Stehrer and G.J. de Vries, 2015, 'An Illustrated User Guide to the World InputOutput Database: the Case of Global Automotive Production,' *Review of International Economics*, 23, pp. 575605.

[65] Wälde, K., 2015, 'Stress and Coping: An Economic Approach,' *Mimeo*, University of Mainz.

[66] Wälde, K. and P. Weiß, 2007, 'International Competition, Downsizing and Wage Inequality,' *Journal of International Economics*, 73, pp. 396-406.