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Article abstract

This paper evaluates the effect of increased trade on the mortality of workers in the manufacturing sector. We exploit the large increase of Chinese exports in the last two decades to assess its effect in two different countries, Italy and the US. Exploiting individual longitudinal data, we find that trade leads to an increased mortality rate among these populations, the effect being higher in Italy than in the US. A one billion dollar increase in imports leads to a 4 percent mortality increase in the US and up to 7 percent in Italy. We show that mortality patterns are different across occupational groups, with a more pronounced effect on blue-collar workers in the US and in Italy, a marked effect on managers of small firms. We show that there are important spatial inequalities in the mortality burden of trade.

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# TRADE INDUCED MORTALITY*

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RÉSUMÉ – Cet article évalue l'effet de l'intensification des échanges sur la mortalité des travailleurs du secteur manufacturier. Nous exploitons l'importante augmentation des exportations chinoises au cours des deux dernières décennies pour évaluer ses effets dans deux pays différents, l'Italie et les États-Unis. En exploitant les données individuelles longitudinales, nous constatons que le commerce entraîne une augmentation du taux de mortalité parmi ces populations, l'effet étant plus important en Italie qu'aux États-Unis. Une augmentation des importations d'un milliard de dollars entraîne une augmentation de la mortalité de 4 % aux États-Unis et de 7 % en Italie. Nous montrons que les modèles de mortalité diffèrent d'un groupe professionnel à l'autre, avec un effet plus prononcé sur les cols bleus aux États-Unis et en Italie et un effet marqué sur les dirigeants de petites entreprises. Nous montrons qu'il existe d'importantes inégalités spatiales dans le fardeau de la mortalité liée au commerce.

ABSTRACT – This paper evaluates the effect of increased trade on the mortality of workers in the manufacturing sector. We exploit the large increase of Chinese exports in the last two decades to assess its effect in two different countries, Italy and the US. Exploiting individual longitudinal data, we find that trade leads to an increased mortality rate among these populations, the effect being higher in Italy than in the US. A one billion dollar increase in imports leads to a 4 percent mortality increase in the US and up to 7 percent in Italy. We show that mortality patterns are different across occupational groups, with a more pronounced effect on blue-collar workers in the US and in Italy, a marked effect on managers of small firms. We show that there are important spatial inequalities in the mortality burden of trade.

* We are grateful to seminar and conference participants at various institutions for comments. The paper is based on the conférence François-Albert-Angers, given as a keynote lecture to the Société Canadienne de sciences économiques in May 2018.

## Introduction

The last decades have witnessed a large increase of globalization, fuelled in part by the rise of exports coming from Asia and more particularly from China. Figure 1 shows the change in imports for ten selected developed countries from the early 1990s to 2015. All series have been normalized to one in 1990, to show the relative change over that period. The amount of imports from China has increased by a factor 10 to 40. The biggest increases are in countries closer to China such as Australia and New Zealand. Remarkably, Japan has not seen such a big increase despite its localization and experienced similar increases as the US, Germany or Italy by a factor of about 10 only.

Such a large macroeconomic change was bound to have many repercussions in the developed world. A rather direct consequence is the employment in the manufacturing industry in countries exposed to such increased imports. Figure 2 shows the trend in employment shares in the manufacturing industry, for the same set of countries. At first glance, it is hard to detect a direct causation from imports to employment shares. The latter were already trending downwards in the early 1990s (and even before that), although Chinese imports were low in that period and really started to increase after 2000. However, a number of studies, including Bernard *et al.* (2006), Autor and Dorn (2013), Autor *et al.* (2013), Autor *et al.* (2014), Pierce and Schott (2016) and Fort *et al.* (2018) have established a direct link between imports, plant survival, reallocation from labour towards capital and the decrease of employment in the manufacturing sector. All those studies pertain to the US. For the case of Italy, Federico (2014) shows that imports from low-wage countries had a similar negative effect on employment. Ebenstein *et al.* (2014) and Acemoglu *et al.* (2016) show that import competition had a wider effect than just the manufacturing industry. This literature complements other findings on the effect of outsourcing and capital investment on wages and the labour market (Feenstra and Hanson, 1999). Wider effects of trade shocks include its effect on income inequality (Hanson and Harrison, 1999), or the provision of public goods (Feler and Senses, forthcoming).

The demonstrated effects of trade on income and labour market participation may have consequences for the health of affected workers. Indeed, an abundant literature in epidemiology has shown how low income and unemployment lead to poor health (Bartley, 1994; Marmot *et al.*, 1991; Martikainen *et al.*, 2007). There are many pathways that lead from lower socio-economic status to poor health, including stress, poorer health behaviour, delayed or decreased access to health care among others. An overview of the economic literature can be found in Smith (1999). The subsequent literature includes Adams *et al.* (2003), Adda *et al.* (2003), Martikainen *et al.* (2003) or Lindahl (2005) at the individual level. The literature in economics also has more recently documented the effect of job loss on health and mortality (Eliason and Storrie, 2009; Sullivan and von Wachter, 2009; Rege *et al.*, 2009; Kuhn *et al.*, 2009; Black *et al.*, 2015; Browning and Heinesen, 2012; Schaller and Stevens, 2015) or on income and mortality (Snyder and Evans, 2006).

There is also a substantial literature that looks at macroeconomic shocks and health or mortality, pioneered by Ruhm (2000) which shows a positive effect of recessions on mortality. Adda *et al.* (2009) show similar effects exploiting exogenous income shocks. Part of this effect can be due to a change in health behaviour with less alcohol consumption during recessions (Ruhm and Black, 2002; Ruhm, 2003, 2005, 1995, 2015; Chaloupka *et al.*, 2002; Page *et al.*, 2009; Nelson, 2013; Stevens *et al.*, 2015). Another important health behaviour is smoking which could be affected by economic circumstances, as smokers are price sensitive (Chaloupka and Warner, 2000; DeCicca *et al.*, 2002; Chaloupka *et al.*, 2002; Adda and Cornaglia, 2006). Economic fluctuations are also associated with mortality through early life conditions (Van den Berg *et al.*, 2006) and through the propagation of viral diseases. Viral epidemics are more prone to occur during economic booms (Adda, 2016) and elderly individuals are at risk of death from flu-like diseases.

If one were to extrapolate the results from the literature linking business cycles and mortality, one would think that the effect of trade shocks would be to decrease mortality. Opposite conclusions would be reached based on the literature exploiting individual shocks to income and labour supply. It is not clear whether trade shocks resemble other economic shocks like recessions, which have been used as an adverse economic shock to measure the effect of economic status on health. It may be the case that trade shocks lead to different outcomes and it is then important to measure directly its effect on health. For instance, trade shocks may be perceived as lasting longer than recessions which could lead to more severe mental effects. On the other hand, trade shocks are perhaps also more industry specific, and other jobs may be available in the vicinity of the firm that has been impacted, mitigating the effect of the shock. It is therefore important to directly evaluate its consequences.

Our paper contributes to our understanding of the consequences of trade shocks by looking directly how they affect a particular outcome – mortality – in two different countries, Italy and the US. We exploit time and industry variation in exposure to trade shocks from China, and we follow individuals over time to record mortality. A recent literature has looked at various health outcomes following trade shocks. Colantone *et al.* (2015) investigates its effect on mental health, Lang *et al.* (2016) on self-assessed health, McManus and Schaur (2016) and Hummels *et al.* (2016) on work injuries, while Pierce and Schott (forthcoming) look at mortality and Adda and Fawaz (2018) study health, health behaviour, health care access and mortality in the US. Charles *et al.* (2018) show the effect of trade on opioid use in the US.

By comparing two countries with different labour markets but also health care systems, we can contrast the effects of such economic shocks. We find an adverse effect of these shocks on mortality in both countries, with larger effects in Italy than in the US. A 1 billion dollar increase in imports from China leads to an increase in the hazard of dying (all causes) and this effect increases with a lag of four-five years between the trade shock and the mortality outcome. We find an increase in the hazard of death of up to 7 percent in Italy, and up to 4 percent in the US. Moreover, we show that mortality patterns are different across occupational groups, with an effect on blue-collar workers and in Italy a marked effect on managers of small firms. We show that there are important spatial inequalities in the mortality burden of trade.

The paper is organized as follows. Section 1 describes the data used in the analysis. Section 1 describes the data and empirical strategy. Section 2 presents the methodology and the empirical results. Finally, last section concludes.

## 1. Data

The data consist of trade data, at an annual frequency and disaggregated at 3 digit industry level. For Italy, we measure imports from China between 1988 and 2012, at 3 digit NACE codes. For the US, imports from China are extracted from COMTRADE for the 1991-2011 period, and from Schott's International Economics Resource Page for the 1979-1990 period. Our trade data cover years from 1988 to 2011.

The aggregate imports from China to Italy and the US are shown in Figure 3. Imports were negligible before 1990 and started to rise sharply from year 2000 in both countries, with a decrease corresponding to the economic crisis of the year 2009. Figure 4 breaks down the aggregate Chinese imports into two digit sectors. Those imports only concern some manufacturing sectors, such as machinery, wearing apparel or radio and television in both Italy and the US. In contrast, sectors like printing or motor vehicles hardly saw any rise in imports at all. The two digit breakdown masks some important heterogeneity. For instance, Figure 5 breaks down the electric equipment sector in Italy into its three digit components. Although there has been a general increase in imports for this two-digit sector, specific industries have faced very different competition from China. The insulated wire industry has not seen much of an increase in imports, contrary to the one producing electric motors for instance.

Figure 6 shows Chinese imports in 2010 by two-digit sector for both countries, together with the share of that sector in the economy. There is little correlation between the size of the sector and the amount of imports. However, there are differences across countries. Within the five largest sectors, the US has fared relatively better than Italy. In both countries, the food sector is facing little import competition, but in Italy, all the other large sectors have seen large increases in imports. In the US the largest and fifth-largest sectors have seen little import competitions. The extent of the effect of import competition also depends on how easy it is to move from one sector to the other and how concentrated they are geographically.

This heterogeneity in import competition across three digit industry sectors allows us to contrast the fate of manufacturing workers differently affected by those imports. By following them over time, one can difference out aggregate shocks such as recessions, severe weather episodes or viral epidemics that could influence aggregate mortality, as well as difference out industry specific mortality patterns. The latter could be due to exposure to chemicals or difficult work conditions, which may lead to different mortality.

The longitudinal data on mortality is taken from administrative data from social security records in Italy and from the National Health Interview Survey (NHIS) for the US. The Italian INPS data covers the period 1990-2013 and provide us with 24 years of panel data. It includes a set of individual characteristics, including industry, at a disaggregated level (3-digit Ateco, converted to 3 digit NACE codes); and region of residence. The sample size is equal to half a million manufacture workers, aged 16-65 at the baseline. The US NHIS data follows manufacturing workers for 26 years, between 1986 and 2009. The data include a full set of individual characteristics, including industry, at a very disaggregated level (3-digit Census 1990 based on 3-digit SIC, 4-digit Census 2002 based on 4-digit NAICS); and county of residence. The sample consists of 130,000 manufacture workers, aged 18-65 at the baseline.

In both cases, individuals are followed until exit or death, up to 2011 in the US and 2013 in Italy. Table 1 provides descriptive evidence regarding the mortality data for both countries. We follow individuals for mortality and trade exposure on an annual basis, leading to close to 10 million person-year observations in Italy and over 2 million in the US. Given that we focus on a population that is of working age at the baseline, the sample is still rather young. We consider the birth cohorts from the mid 20s to 1996, so we observe only 26,000 deaths in Italy and about half as many in the US. Moreover, the average age at death, around 60, is much younger than the unconditional age at death in the population. As this population is drawn from the manufacturing industry, there is an over-representation of men in both countries, with a large share of low-educated individuals.

Figure 7 plots the Kaplan-Meier survivor function estimated from the mortality follow-up in both countries. Unsurprisingly, the fraction of surviving individuals is close to one at young ages and gets steeper at later ages. Figure 8 displays the nonparametric hazard of death by occupational class in Italy (the data does not give information on education) and by education in the US. We find in both countries an economic position gradient in mortality, with individuals with higher status (occupational or educational) having lower mortality rates.

## 2. Empirical Methodology and Results

We now turn to the analysis of the effect of trade on subsequent mortality. We model the hazard of death of an individual $i$, initially in sector $s$, living in area $a$ and in year $t$ as:

$$h(age_{it}|Trade_{s,t-k}, X_{i,s,a,t}) = h_0(age_{it}|X_{i,s,a})exp(Trade_{s,t-k}\beta + \delta_t) \quad (1)$$

where $Trade_{s,t}$ is the volume of trade in billions of dollars, $X_{i,s,a,t}$ is a set of conditioning variables that include sex, occupation sector, occupational group and region of living. The hazard is of the Cox proportional form, where the baseline hazard of death, $h_0()$ is allowed to be specific to characteristics $X_{i,s,a}$. We allow trade volumes to affect mortality with a lag of $k$ years. Import competition can have an immediate effect on mortality through changes in fatal accidents or through a mental health channel, leading to increased suicide rates. In addition, it can also affect health with a lag as cardiovascular problems or cancer may develop as a result of stress, poorer health behaviour or lack of access to health care. In practice, we investigate the effect of trade up to 6 or 7 years.

We control for individual observed characteristics that may influence mortality patterns. When using Italian data, each regression includes NACE 3-digit sector codes, region of residence, gender and occupational class. The latter is based on the job description in the social security data and we group them into three categories, distinguishing blue-collar jobs, white-collar jobs and managerial positions. For the US, the regressions include more characteristics as we observe the area where the individual lives (commuting zones), gender, race, education and self-assessed health. The latter allows us to control for self-selection in manufacturing sectors, based on health. This is not necessarily an important problem as we follow individuals for a long period, and in many cases well before China erupted on the international export scene. As the sectors in which China specialized are diverse, it is unlikely that health selection occurs on an important scale.

The design is based on a difference-in-difference approach. We control for aggregate time effects – in the parametric part of the hazard and for industry sector fixed effects – in the nonparametric baseline of the hazard. Individual mortality data allows us to perform survival analysis and to also control for individual characteristics (such as gender or area of living), contrary to aggregate death-rate data.

The model is estimated using maximum likelihood methods. Table 2 displays the results.[1] Contemporaneously, at lag 0, we find that trade increased the hazard of death by 2 percent in both countries. This effect which is very quick may be due to mental health issues, leading to suicides or accidents. The effect is then increasing with the lag of the import shock. The effect appears to be larger in

1. The table reports the results for the US as in Adda and Fawaz (2018).

Italy than in the US with a peak at about 7 percent after five years in Italy and about 4 percent in the US.

The increase that we are measuring is relative to a baseline hazard that is different across countries, but that is also relatively small, especially at young ages. Hence, it is informative to translate the increase in the hazard of death into the increase in the number of deaths per year. This is done by multiplying the effect of trade on mortality by the baseline hazard and the population at risk. In Italy, a 7 percent increase corresponds to about 250 extra deaths per year for Italian manufacture workers per billion USD imports. For the US a similar increase in trade volumes leads to about 330 extra deaths per year.

Table 3 breaks down the results by occupational class for both countries. For Italy, we find very small effects of trade on mortality amongst blue-collar workers. What is more, those effects are not significant at the conventional 5 percent threshold. As for the whole population, we find that the effect is increasing with the time since the import shock, culminating after 5 years. We find larger effects (and significant ones) for white-collar individuals, with no particular trend. The effect is equal to about 12 percent from a lag of 0 to 6 years. The effect is even larger for workers in managerial positions. The effect of trade is significant at the 5 percent level for lags of 1 to 2 years. The magnitude of the effect appears large, but as shown in Figure 8, the hazard of death is lower for these categories, so that the effect of trade in levels, which is the product of the baseline and the proportional term including trade, is therefore lower than suggested in the Table.

Panel B of Table 3 shows the results for the US. The results differ somewhat from those for Italy. In particular, trade significantly affects the mortality of blue-collar workers in the U.S., with a lag of 2 to 3 years (the effect for subsequent years is of similar magnitude but statistically insignificant). The effects for white-collar workers are similar to that for blue-collar workers, although they are never statistically significant. We do find larger and statistically significant effects for managers, especially for a lag of 2 to 3 years after the trade shock.

Finally, Table 4 focuses on the Italian case and in particular that of managers. We partition the data set according to the size of the firm, with a cutoff at 50 employees. We find that the effect of trade on mortality is for the most part driven by smaller firms. The effect is large and statistically significant, even at the 1 percent level for various lags, from 1 to 4 years.

The differences in the effect of trade across Italy and the US could be due to the structure of the Italian industry. Italian firms are traditionally small and family owned (Goodman *et al.*, 2016) and a number of them were operating in sectors that ended up facing stiff import competition from the Chinese industry. In the US, the Chinese trade shock did not lead to large firm or plant closures (Bernard *et al.*, 2006; Adda and Fawaz, 2018), but rather to a decrease in the number of employed workers per plant. At the same time, firms reacted to import competition by increasing the industry skill intensity and industry capital intensity (Pierce and

Schott, 2016; Khandelwal, 2010), and byproduct upgrading (Bernard *et al.*, 2006). Bloom *et al.* (2015) show that import competition led to technological change as measured by patents, information technology intensity or total factor productivity changes in a number of countries including European ones. It is unclear whether the same phenomenon occurred in Italy with the same magnitude.

The particularities of the Italian industry could therefore explain the particularly large effect of trade shocks on managers of small businesses, as well as the quickness of the effect, through a sharp deterioration of mental health and an increased risk of suicide.

## 3. Geographical differences

A large literature in epidemiology has focused on spatial inequalities in health which calls for policies to promote social cohesion (see for instance (see for instance Haynes, 1991; Kawachi and Kennedy, 1997). The economic literature has also investigated spatial inequalities in its relationship with development (Venables and Kanbur, 2005).

We assess the spatial inequality in mortality induced by trade. This depends on several factors. First, as not all manufacturing sectors face similar import competition, there is spatial heterogeneity due to the location of different industries. Figure 9 shows the population share in the manufacturing sector in 1995, by Italian provinces. The manufacturing industry is not randomly located, but is more concentrated in the Northern part of the country. Second, as trade has a differential impact across occupational groups, there is also dispersion in the share of workers across groups, even within industry sectors. We combine these effects to calculate the excess number of deaths due to imports, in different provinces of Italy, constructing the counterfactual scenario with imports in 2010, set at the levels of 1993. Figure 10 plots the results. As is evident, there is a large spatial inequality in mortality linked to trade. The effect is mostly concentrated in the North-East of the country, from the regions of Piemonte to Veneto, which contains a large share of manufacturing industries. In contrast, the South, which has little manufacturing, is hardly affected.

## Conclusion

The paper evaluates the effect of trade on mortality in a multi-country setting, by comparing Italy to the US. We use individual longitudinal data on manufacturing workers, followed until death for up to a quarter of a century. This long time span allows us to contrast the fate of workers who are similar in a number of characteristics, but exposed to different levels of trade across time and sectors. We find an increased hazard of death linked to higher levels of imports. The effect is larger in Italy than in the US. It also varies across occupational groups. While in the US, blue-collar workers and managers have a significant increase in their hazard of death, in Italy, the effect is mostly concentrated in managers, and especially managers of small firms. In Italy, we do not find significant or large effects of trade on blue-collar workers.

The differences across countries can be explained by two main factors. First, the two countries differ in terms of health care. While in the US health care largely depends on the employer, Italy has a universal and national health care system. Laid-off workers still have access to free health care in Italy. Adda and Fawaz (2018) shows that the lack of health care access among unemployed workers in the U.S. is one of the channels linking trade shocks to poorer health. Reduced access to health care causes delays in the treatment of health conditions, leading to complications and poorer health. However, it is striking that the effect of trade appears to be more harmful in Italy than in the US, despite the former having an easier and more universal access to health care than the latter. One possible explanation for this is that the trade shock may have been more pronounced in Italy, and especially in smaller firms because of a lack of insurance through access to funding from the banking sector (Fagiolo and Luzzi, 2006).

In addition, as shown in Artuc *et al.* (2010) and Dix-Carneiro (2014), mobility across sectors is low as workers lose sector human capital, which confines impacted workers to unemployment or non-employment. One particular feature of trade shocks, as opposed to shocks such as recessions, is that there is little gain in geographical mobility, as the shock affects all firms in the same sectors in a similar way. In contrast, the strength of a recession typically varies across a country such as the US. Workers affected by a trade shock have then limited options to find new jobs. The massive increase in imports and their geographical localization may be a factor in the recent decrease in the life expectancy experienced in the US, documented by Case and Deaton (2015) and the current opioid epidemic.

FIGURE 1

IMPORTS FROM CHINA

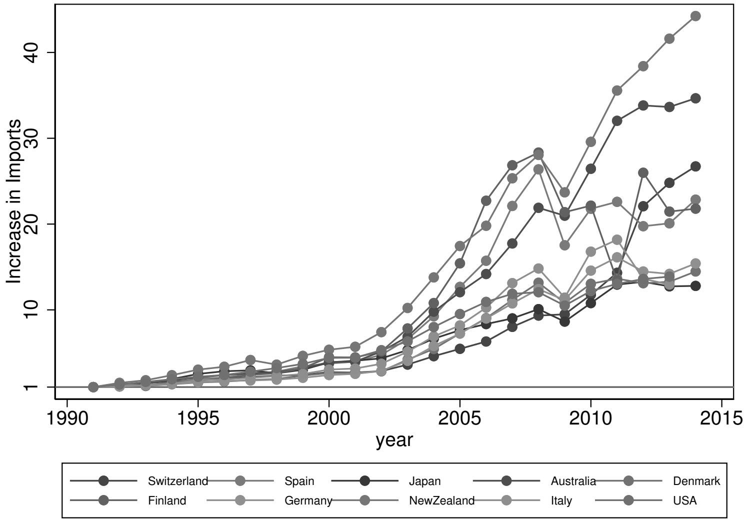



FIGURE 2

EMPLOYMENT SHARES IN INDUSTRY

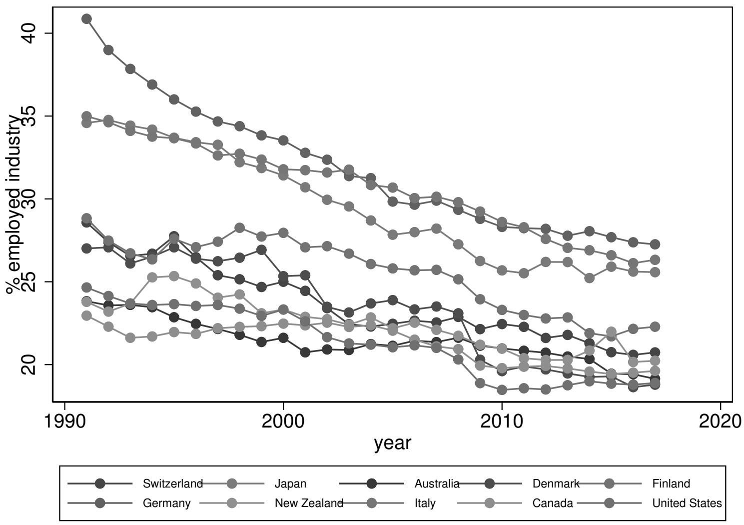
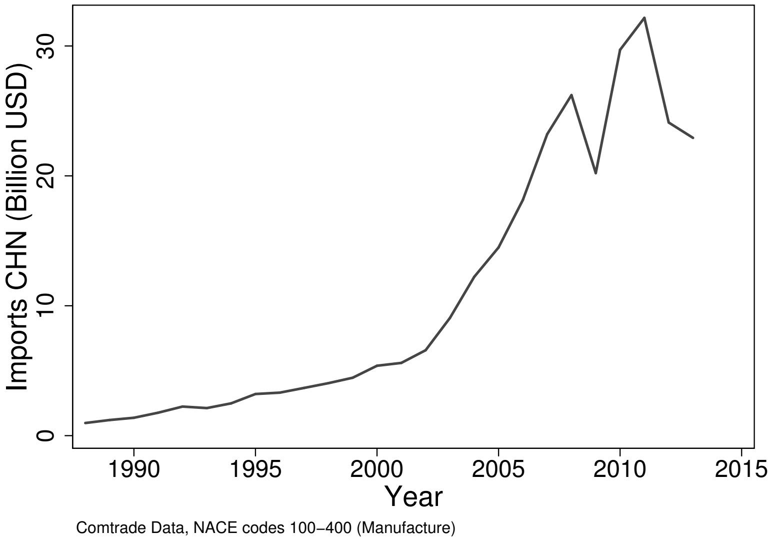


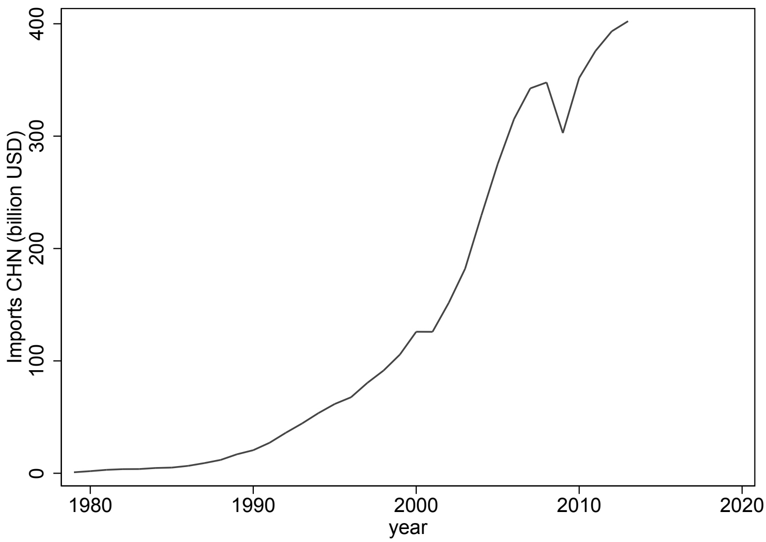
FIGURE 3

IMPORTS FROM CHINA

Italy



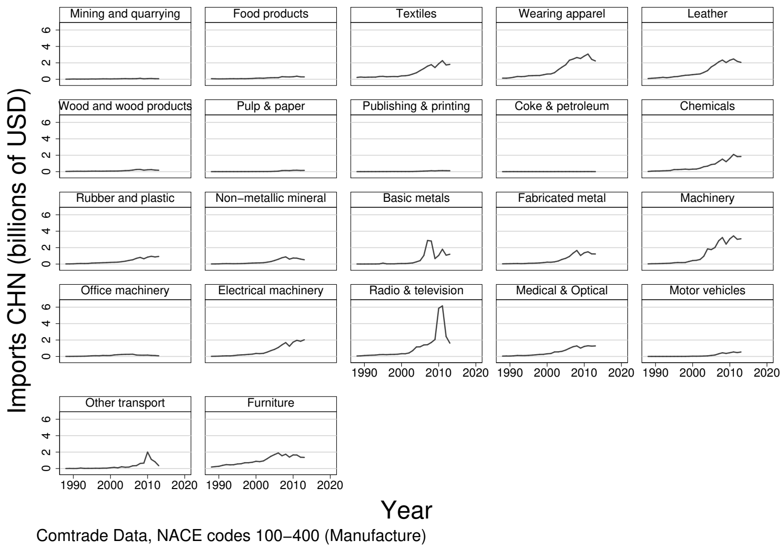

US



# FIGURE 4

## IMPORTS FROM CHINA, 2 DIGIT SECTORS

### Italy




### US

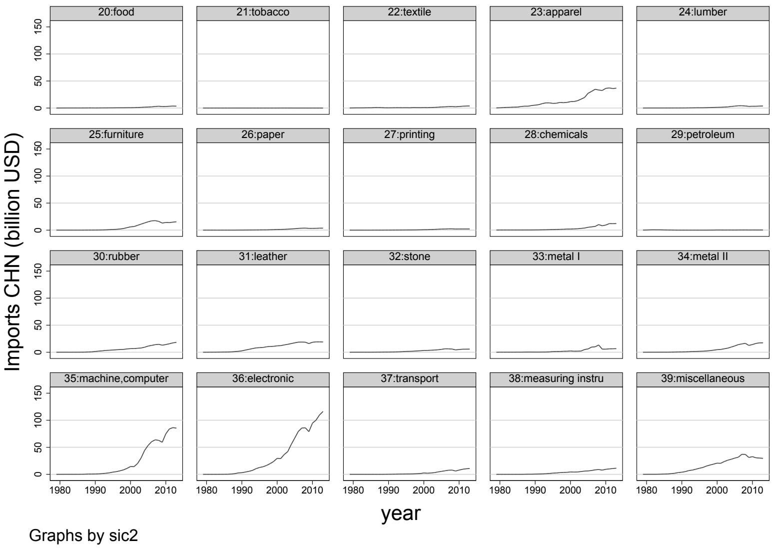
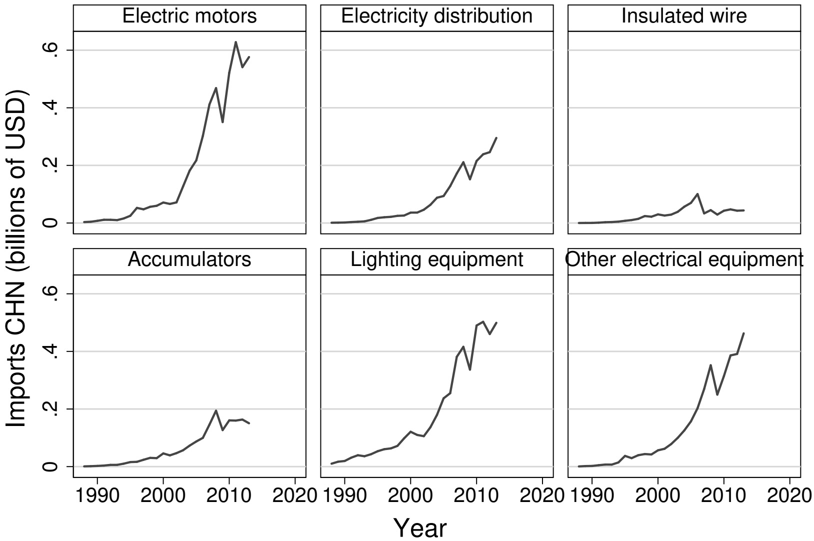


FIGURE 5

IMPORTS FROM CHINA TO ITALY, ELECTRIC EQUIPMENT SECTOR

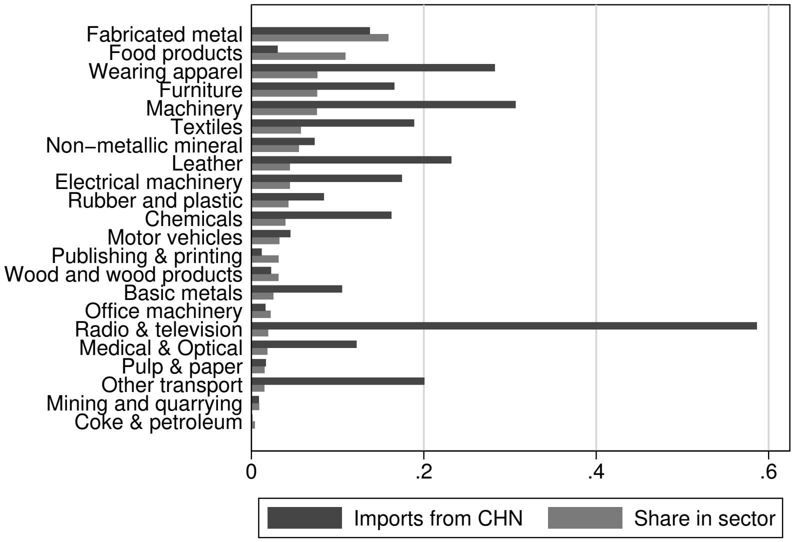



Comtrade Data, NACE codes 310–319 (Electrical equipment)

FIGURE 6

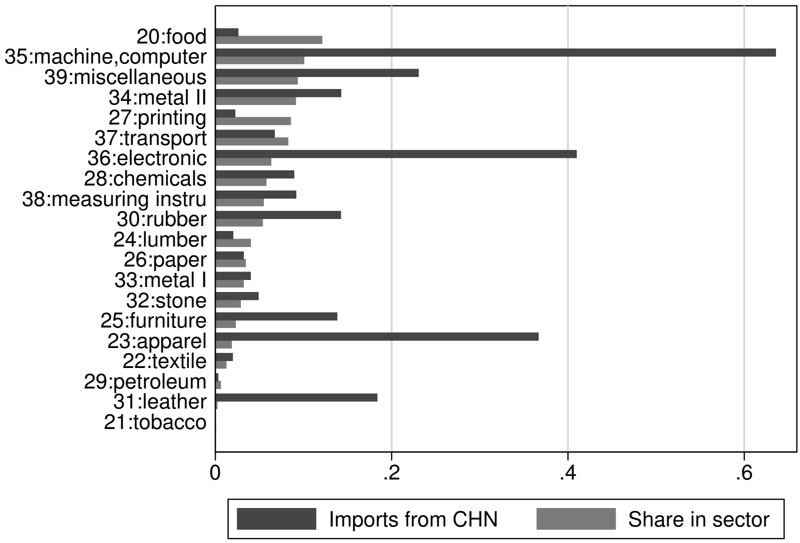
IMPORTS FROM CHINA AND SIZE OF SECTOR

Italy




Note: Trade in 10 of billions USD in 2010.

US

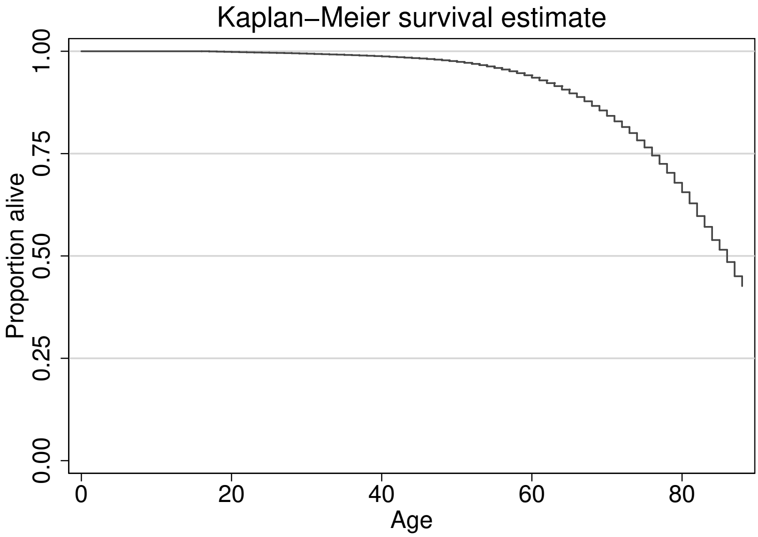



Note: Trade in 100 of billions USD in 2010.

FIGURE 7

KAPLAN-MEIER SURVIVAL CURVE

Italy US



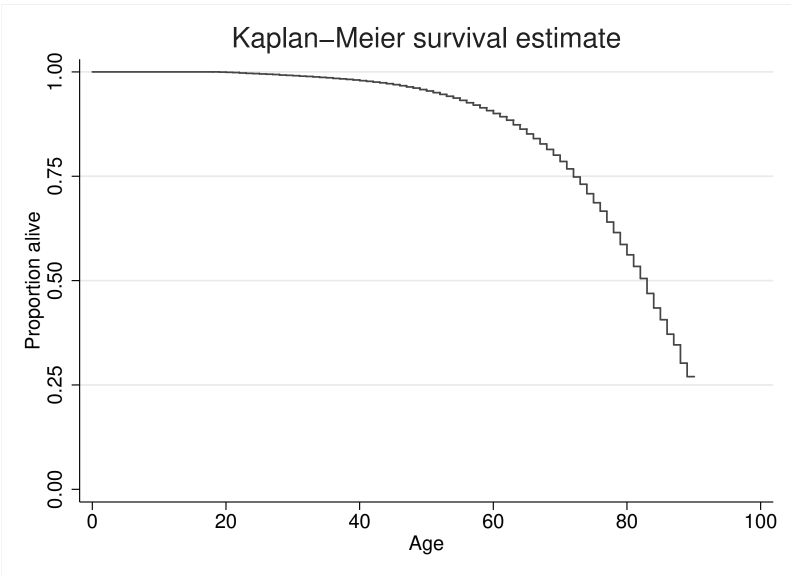
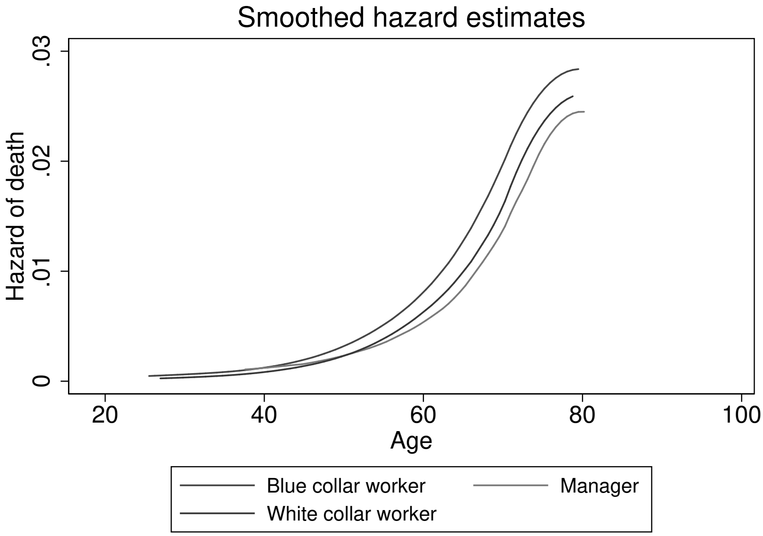



FIGURE 8

HAZARD OF DEATH, BY OCCUPATIONAL CLASS OR EDUCATION

Italy US



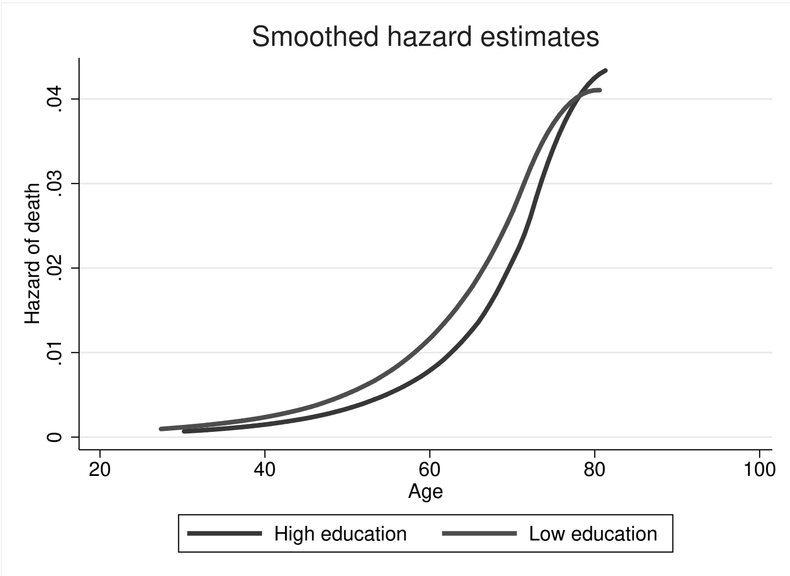



FIGURE 9

POPULATION SHARE IN MANUFACTURING, BY ITALIAN PROVINCE

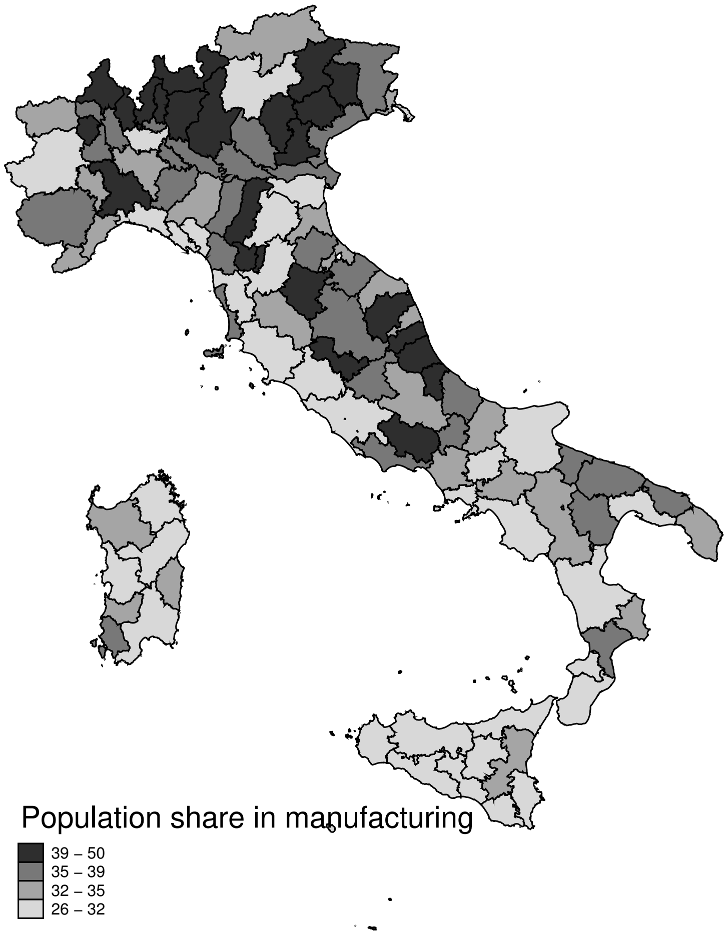


FIGURE 10

GEOGRAPHY OF DEATH, 1993-2010

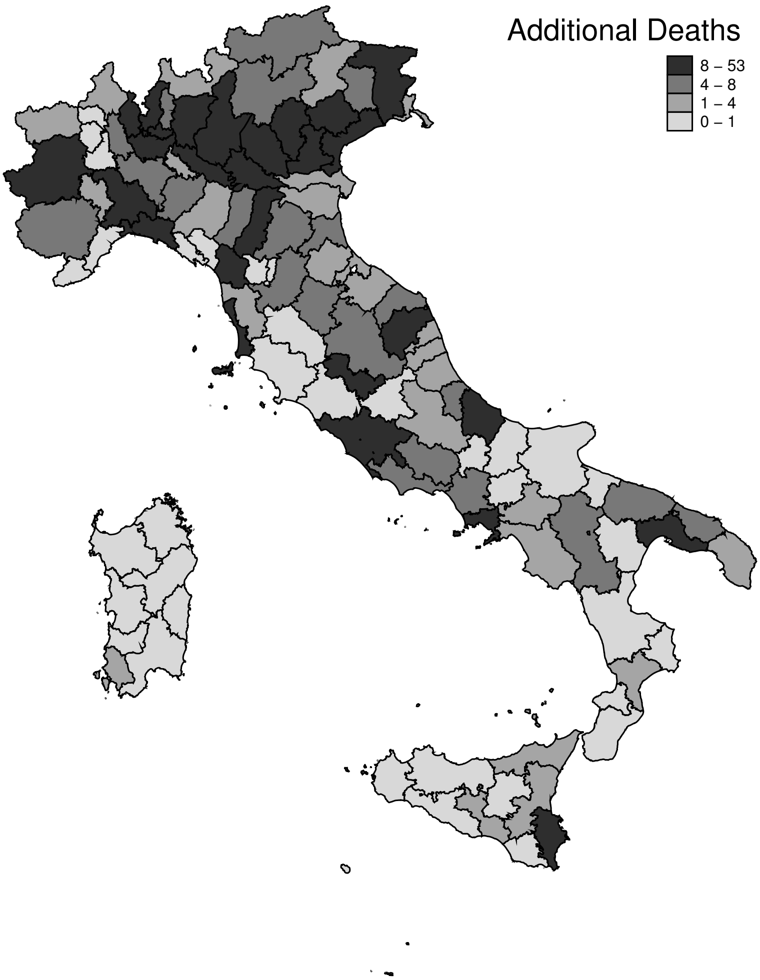


TABLE 1

DESCRIPTIVE STATISTICS

| | **Italy** | **US** |
|---|---|---|
| Observations (person-years) | 9,992,527 | 2,334,710 |
| Subjects | 577,448 | 130,313 |
| Birth cohorts | 1925-1996 | 1921-1994 |
| Male | 68% | 65% |
| Low education / social class | 78% | 61% |
| Number of deaths | 26,432 | 12,585 |
| Average age at death | 59.3 | 62.3 |
| Earliest entry | 16 | 18 |
| Oldest exit | 88 | 90 |

TABLE 2

EFFECT OF TRADE ON DEATH HAZARD

| | **Italy** | **US** |
|---|---|---|
| Lag 0 | 0.022 (0.027) | $0.018^{***}$(0.006) |
| Lag 1 | $0.044^{**}$ (0.022) | |
| Lag 2 | 0.037 (0.025) | $0.022^{***}$(0.007) |
| Lag 3 | 0.035 (0.026) | |
| Lag 4 | $0.049^{**}$ (0.020) | $0.025^{***}$ (0.007) |
| Lag 5 | $0.067^{**}$ (0.023) | |
| Lag 6 | 0.047 (0.039) | $0.039^{**}$ (0.016) |
| Lag 7 | 0.039 (0.059) | |

NOTE: For Italy, baseline hazard stratified by NACE 3-digit sector codes, region of living and gender. Regression controls for annual time dummies and are separate by lag. Standard errors are clustered at NACE 3-digit level. For US, Baseline hazard stratified by 3-digit industry codes, commuting zones, gender, race, education and self-assessed health. The regressions control for a yearly trend. Each entry corresponds to a separate regression. Standard errors clustered at industry 3-digit sector. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE 3

EFFECT OF TRADE ON DEATH HAZARD, BY OCCUPATION, ITALY

| | **Blue Collars** | **White Collars** | **Managers** |
|---|---|---|---|
| Panel A: Italy: | | | |
| Lag 0 | −0.002 (0.030) | 0.120** (0.060) | 0.388* (0.211) |
| Lag 1 | 0.022 (0.023) | 0.123** (0.059) | 0.544** (0.245) |
| Lag 2 | 0.012 (0.026) | 0.109 (0.066) | 0.832** (0.394) |
| Lag 3 | 0.014 (0.025) | 0.102 (0.077) | 0.624* (0.357) |
| Lag 4 | 0.023 (0.020) | 0.133* (0.078) | 0.678* (0.408) |
| Lag 5 | 0.042* (0.025) | 0.135 (0.111) | 0.951 (0.682) |
| Lag 6 | 0.021 (0.038) | 0.127 (0.121) | 0.999 (0.633) |
| Lag 7 | 0.025 (0.048) | 0.076 (0.203) | 0.741 (0.593) |
| Panel B: US: | | | |
| Lag 0 | 0.008 (0.010) | 0.02 (0.013) | 0.021 (0.014) |
| Lag 1 | 0.024* (0.013) | 0.02 (0.018) | 0.023 (0.018) |
| Lag 2 | 0.029** (0.013) | 0.022 (0.018) | 0.042** (0.019) |
| Lag 3 | 0.028** (0.012) | 0.027 (0.017) | 0.044** (0.018) |
| Lag 4 | 0.025* (0.013) | 0.036 (0.020) | 0.033 (0.021) |
| Lag 5 | 0.025 (0.016) | 0.045 (0.026) | −0.001 (0.032) |
| Lag 7 | 0.06** (0.031) | 0.075 (0.051) | −0.01 (0.051) |

NOTE: Baseline hazard stratified by NACE 3-digit sector codes, region of living and gender. For Italy, regressions control for annual time dummies. For the US the regressions control for annual time dummies, commuting zones, gender, race, education and self-assessed health. All regressions are separate by lag and by occupational class. Standard errors are clustered at NACE 3-digit level.

TABLE 4

EFFECT OF TRADE ON DEATH HAZARD, FOR MANAGERS BY SIZE OF FIRM IN ITALY

| **Imports** | **Small Firms** | | **Large Firms** | |
|---|---|---|---|---|
| Lag 0 | 0.501 | (0.325) | 0.386* | (0.209) |
| Lag 1 | 0.659*** | (0.22) | 0.509* | (0.286) |
| Lag 2 | 0.77*** | (0.236) | 0.662* | (0.376) |
| Lag 3 | 0.688*** | (0.232) | 0.574 | (0.402) |
| Lag 4 | 0.746*** | (0.21) | 0.618 | (0.455) |
| Lag 5 | 0.913** | (0.42) | 0.818 | (0.712) |
| Lag 6 | 0.809** | (0.376) | 0.715 | (0.686) |
| Lag 7 | 0.64 | (0.491) | 0.337 | (0.599) |

NOTE: Small firms defined as having fewer than 50 employees. Baseline hazard stratified by NACE 3-digit sector codes and gender. Regression controls for annual time dummies and are separate by lags. Standard errors are clustered at NACE 3-digit level.

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