

C A G E

Pandemics and Protectionism: Evidence from the “Spanish” flu

CAGE working paper no. 479

June 2020

Nina Boberg-Fazlic
Markus Lampe
Maja Uhre Pedersen
Paul Sharp

Pandemics and Protectionism: Evidence from the “Spanish” Flu

Nina Boberg-Fazlic, University of Southern Denmark

Markus Lampe, WU Vienna University of Economics and Business, CEPR

Maja Uhre Pedersen, University of Southern Denmark

Paul Sharp, University of Southern Denmark, CAGE, CEPR¹

Abstract: The impact of COVID-19 on recent tendencies towards international isolationism has been much speculated on but remains to be seen. We suggest that valuable evidence can be gleaned from the “Spanish” flu of 1918-20. It is well-known that the world fell into a protectionist spiral following the First World War, but scholars have almost exclusively ignored the impact of the pandemic. We employ a difference-in-differences strategy on data for Europe and find that excess deaths had a significant impact on trade policy, independent of the war. A one standard deviation increase in excess deaths during the outbreak implied 0.022 percentage points higher tariffs subsequently, corresponding to an increase of one third of a standard deviation in tariffs. Health policy should aim to avoid the experience of the interwar period and consider the international macroeconomic impact of measures (not) taken.

JEL codes: F13, I19, N74

Keywords: Pandemics, protectionism, trade

¹ Corresponding author: pauls@sam.sdu.dk

1. Introduction

What an extraordinary episode in the economic progress of man that age was which came to an end in August 1914! ... The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery upon his doorstep; he could at the same moment and by the same means adventure his wealth in the natural resources and new enterprises of any quarter of the world ... or he could decide to couple the security of his fortunes with the good faith of the townspeople of any substantial municipality in any continent that fancy or information might recommend. He could secure forthwith, if he wished it, cheap and comfortable means of transit to any country or climate without passport or other formality ... most important of all, he regarded this state of affairs as normal, certain, and permanent, except in the direction of further improvement, and any deviation from it as aberrant, scandalous, and avoidable. The projects and politics of militarism and imperialism, of racial and cultural rivalries, of monopolies, restrictions, and exclusion ... appeared to exercise almost no influence at all on the ordinary course of social and economic life, the internationalization of which was nearly complete in practice.

- John Maynard Keynes (1920), *The Economic Consequences of the Peace*.

To what extent might health emergencies have an impact on international macroeconomic policy? Might countries turn more inwards following loss of life during the Covid-19 pandemic? There has been much speculation about how the post-coronavirus world will look. For example, an article in the *New York Times* stated that the coronavirus has come at a time “when the world was already turning inward, largely in reaction to the global financial crisis of 2008. Nations have been erecting barriers to the free flow of people, money and goods”.² Only history can give us any guidance, and the same article points out in passing that the Spanish flu perhaps simply “accelerated trends that were already underway”. We quantify the impact of the severity of the impact of the pandemic on openness, and trade policy in particular, after the First World War, and find that countries hardest hit had more restrictive trade policies during the 1920s, even when controlling for participation in the war.

Economists have long known that the First World War led to a definitive break in the globalization of the late-nineteenth century (see for example O’Rourke and Williamson, 1999), and the above quote from Keynes, reminiscing just after the First World War about the lost world of internationalization that had gone before, has often been used to illustrate this (see e.g. Harley 2020). Thus, the war itself

²Ruchir Sharma, “The Pandemic Isn’t Changing Everything”, *New York Times*, May 3, 2020.

has often been considered to mark the division between the “first era of globalization” and the autarky that was to follow. However, no one today could ignore the fact that Keynes was writing during a major pandemic, the so-called “Spanish” flu, which hit Europe in four waves, twice in 1918, once in the first half of 1919, and to a far lesser extent in the spring of 1920. We employ a difference-in-differences strategy on data for Europe, finding that countries with higher excess mortality saw increased trade protection subsequently. This is independent of the similarly positive effect of participating in the First World War, and a flexible specification reveals that countries were on parallel trends prior to the pandemic, but diverged subsequently, with the impact lasting throughout the 1920s until the onset of the Great Depression in 1929.

The remainder of this paper proceeds as follows. The following section provides a brief overview of the historical background to our analysis and Section 3 presents our data. Section 4 presents our empirical strategy and Section 5 gives our results. Section 6 concludes.

2. Historical background

Since the shocks of the First World War and the pandemic overlapped, both events are discussed here. The former had manifold impacts on the World Economy, as systematically summarized by Broadberry and Harrison (2005), Findlay and O’Rourke (2007, 429-443) and Feinstein et al (2008, ch. 2). The most direct were that it killed people, destroyed infrastructure and dramatically increased government spending, most of which went into the “unproductive” war effort. In addition, front lines, destroyed and requisitioned infrastructure, naval blockades and naval warfare severely disrupted international trade, directly and by disproportionately increasing insecurity and corresponding trade costs such as insurance. Workers and resources were drawn from civil production into the war itself and the production and provision of war materials. In the medium run, this created problems for government finance and economic reconversion after the war. Wounded and traumatized soldiers needed to return civilian life. An international oversupply of heavy industry and basic foodstuffs created domestic need for adjustment, and lobby groups campaigned for at least temporary protection after the heroic effort. Franchise extensions were another consequence of the collective efforts, as was the increased importance of parties representing workers’ interests (see for example Przeworski, 2009). Women were also given the vote most places, and de Bromhead (2018) finds that they were more likely than men to hold protectionist attitudes, and that when women were entitled to vote tariffs were, on average, higher.

Heavily burdened government finance craved revenue, and defeated countries in particular turned to the printing press. This was accompanied by balance of payments and banking crises, also in the countries such as the UK which opted for severe deflationist policies in order to return to the gold standard (Morys 2014). Thousands of kilometers of new borders emerged, as the Treaty of Versailles and the breakdown of the Habsburg Empire created new states especially in Central and Eastern Europe. While many of the direct interventions in national and international markets were – except for Germany – dismantled soon after the end of the war (Feinstein et al 2008, 26-27; Hardach 1977, 251-254), the peace treaties failed to commit all parties to the third of US President Wilson’s 14 points: “the removal, as far as possible, of all economic barriers and the establishment of an equality of trade conditions among all the nations consenting to the peace and associating themselves for its maintenance.” (cited after Hardach 1977, 242).³ So, despite efforts to keep markets open through the League of Nations, many of these forces created protectionist backlashes in the 1920s (Findlay and O’Rourke 2007, 443-447), since tariff protection often served several goals, although with minor tradeoffs. Tariffs raised government revenue, aimed to correct balance of payment imbalances, helped struggling import-competitors, and provided visible input to political discourses of national reconstruction and nation-building.

Some of these issues might have worked in the same direction as for the second shock, the Spanish flu, that – on a global level - hit regions with limited healthcare and public health measures harder. Both shocks were related in many ways. A significant share of doctors served in the military instead of in their civilian offices and hospitals. Soldiers spread the disease, both in the military and when returning home from the war. Trade disruptions, like the Allied blockade, affected food provision and precarious nutritional status affected immune systems (Spinney 2018, 249-250). Moreover, little seems to have been written about the importance of public health interventions in Europe during the pandemic itself, but we know that, partly due to the war, far less focus was put on them there than in the US, since communication about outbreaks was far less transparent among the belligerent parties. It has been demonstrated that in the US cities that implemented earlier interventions saw lower rates of transmission (Bootsma and Ferguson 2007 and Hatchett et al. 2007). We might expect the same to

³ The non-adoption of this principle is often attributed to Wilson’s relatively weak position in trade liberalization, as at the same time the US was turning more – non-discriminatorily – protectionist (Hardach 1977, 242). Nevertheless, this “sorry result” (ibid., 243) might also be connected to, as Spinney (2018, 250-252) suggests, the fact that Wilson and his advisor Edward House suffered from influenza during the 1919 Paris Conference, and more importantly suffered from a related stroke later that year that could have compromised Wilson’s strength in a way that otherwise he might have been able to push stronger for the US to join the League of Nations. This, of course, remains speculative counterfactual history.

have been the case in Europe, and on a country-level.

The disease thus likely created pressure on authorities to adopt means and improve access to health care, in similar ways as the presence of veterans, and possibly the franchise extensions to women and poorer sections of the male population, the rise of trade unions, as well as social unrest in general (Feinstein et al 2008). Such means require funding and revenues. Anecdotal evidence, however, suggests that relatively few reactions actually occurred before the 1940s (although notably in Weimar Germany there was a gradual shift to public healthcare), although the League of Nations also featured a health institution (Spinney 2018, 240-246).

On the other hand, at least in the short run, there was a marked increase in suspicions of foreigners and theories about the origin of the (assuredly not) Spanish flu during and immediately after the pandemic (Spinney 2018, 153-165). Such trends might have made ways of raising government revenue that (allegedly) fell on foreigners, like raising tariffs, more acceptable. Highlighting a different version of the same channel, in her popular book on the 1918 influenza pandemic, Laura Spinney (2018, 254-260)⁴ argues that Gandhi's anticolonial movement, which featured campaigns for a boycott of British imports and substitution by traditional Indian production (see Wolcott 1991), received a decisive boost from the tragic outcomes of the Spanish flu in India, although Gandhi had no direct influence on India's rising tariffs (cf. Arthi et al 2020).

So, while admittedly the literature on the macroeconomics of the Spanish flu, and especially on the relationship to policy openness is virtually non-existent, it is likely that the link we uncover below worked through one of the following channels, both difficult to track in existing data: first, since reactions to pandemics are costly, they create needs for revenue, and especially at low(er) state capacity customs duties are a convenient way of raising this (Cagé and Gadenne 2018). Second, if pandemics create a more inward oriented public discourse, increasing tariffs becomes more tolerable.

Ultimately, the onset of the Great Depression in 1929 was to overshadow all aspects of economic policy, and here trade policy seems to have played a significant role. Thus, de Bromhead et al (2019) demonstrate the impact of trade policy on trade flows, showing that policy explains the majority of the UK's shift to Imperial imports in the 1930s. Otherwise, the reasons for the far greater outbreak of protectionism in the 1930s are well known, with Eichengreen and Irwin (2010) demonstrating that exchange rate policies played a crucial role. Countries that retained fixed exchange rates under the

⁴ Cf. Shyam A, Krishna, "How the Spanish flu changed the course of Indian history: Gandhi survived the pandemic that united Indians against the British", *Gulf News*, March 15, 2020.

gold standard were more susceptible to resorting to tariffs, import quotas and exchange controls. Their inability to use monetary policy led them to resort to protectionism in an ultimately futile attempt to stem the decline in their economies. We thus expect that the impact of both the war and the pandemic became subsumed to such pressures after 1929.

3. Data

To investigate the impact of the Spanish flu on trade openness, we make use of two sources of data: for tariffs and for the excess mortality caused by the Spanish flu. For the former we rely on the import-weighted average ad valorem tariff (AVE), as collected by Lampe and Sharp (2013). This is calculated as the ratio of customs duty revenues to total imports for domestic consumption. There are of course a number of issues with this measure of protectionism, as Lampe and Sharp acknowledge. First, some of their data for Germany (1914-24) are interpolated⁵, although our results are not sensitive to the inclusion of that country.⁶ Second, tariffs at that time were usually specific, and thus declining prices would automatically lead to an increase in ad valorem equivalents. Using price data from Jordà et al. (2017), however, we find no correlation between prices and our measure of protection.

Third, not all protection is captured by tariffs, since subsidies, quantitative restrictions and prohibitions are also of importance. While indeed there was wide use of quantitative restrictions up to the Allied sea blockade of the Central Powers from March 1915, which also affected neutral countries in Europe (Hardach 1977, 20-30), except for commercial relationships between especially France and Germany, these were dismantled quickly in Western and Central Europe (Hardach 1977, 251-254). From then on, import duties were the main trade frictions (ibid., 292-294, Feinstein et al, 26, 33-34). However, the fact that the League of Nations in 1927 sponsored a conference on import and export restrictions and in 1929 the “International Convention for the Abolition of Import and Export Prohibitions and Restrictions” was adopted (Boyce 1987, 126, 223-224), might create the impression that in the 1920s, as was to be the case in the 1930s, non-tariff restrictions were omnipresent. They were probably not, however. The Prohibition Convention contained the possibility of exempting certain goods on a country level, and annexes contained these exemptions. Most had to

⁵ Interpolations are also made for revenue for Spain after 1935, and there is a change in the data source (but no interpolation) for the Netherlands in 1914.

⁶ Table A1 and Figure A1 in the Appendix presents results excluding Germany.

do with the possibility of strategically limiting exports, and regarding imports we find clauses only referring to coal, coke, peat, lignite and briquettes in Germany and synthetic and organic dyestuffs and colors in the UK.⁷ We therefore assume that quotas did not distort the level of protection as measured by average tariffs.

For the impact of the Spanish flu, we use data from Ansart et al. (2009) who estimate the number of cumulative excess deaths due to the pandemic. The reported excess mortality is defined as the difference between the observed and the predicted number of deaths (based on interpolation using the pre period 1906-1917) during the pandemic.⁸ This is an extremely crude measure, but no other is, to our knowledge, available for such a large sample of countries. In all countries, the pandemic period starts during 1918 and ends at some point in the first half of 1919. Thus, the relatively minor peak of the flu in April 1920 experienced by several countries is not accounted for by the excess mortality measure.

Finally, given that the pandemic was concurrent to the end of the First World War, as a robustness check, we include a measure for the number of battle deaths during the war in some of the specifications. The number of battle deaths is taken from the “Correlates of War project” (Sarkees and Wayman, 2010).

The result is a balanced panel of AVEs for 12 countries in the cross section.⁹ Tariffs are measured annually from 1900 to 1939, while the number of excess deaths and battle deaths, has just one observation for each country.

Table 1: Summary statistics

Variable	Mean	Standard Deviation	Min.	Max.
<i>Excess deaths</i>	158,751.9	176,442.8	10,650	544,288
<i>Battle deaths</i>	393,691.1	597,343.6	0	1,773,700
<i>Tariff</i>	0.105	0.077	0.008	0.330

Table 1 gives summary statistics. In Figure 1 we map the distribution of excess deaths caused by the Spanish flu while Figure 2 shows the distribution of the decadal average level of tariffs for the 1910s,

⁷ The text of the convention (League of Nations Treaty Series 393) can be found at <https://www.loc.gov/law/help/us-treaties/bevans/m-ust000002-0651.pdf>. Article 4 of the Convention state that, among others, it did not prevent “prohibitions or restrictions imposed for the protection of public health or for the protection of animals or plants against disease, insects and harmful parasites”.

⁸ The exact pandemic period differs from country to country and is defined as the period in which the observed number of deaths exceeded a given threshold.

⁹ Denmark, France, England, Germany, Italy, Netherlands, Norway, Portugal, Scotland, Spain, Sweden and Switzerland.

1920s and 1930s, with darker shades indicating higher levels of deaths/tariffs. The extreme protectionism of the 1930s is very clear.

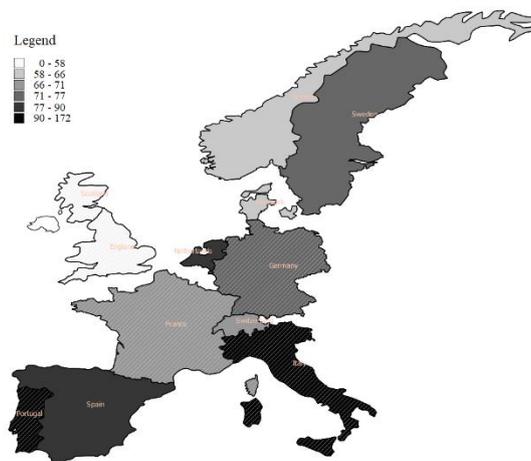


Figure 1: Rates of excess deaths caused by the Spanish Flu from 1918 to 1919

Note: Excess death rates are computed as the number of excess deaths per expected deaths. Darker greys indicate higher excess deaths. The countries shaded diagonally participated in WWI.



Figure 2: Average tariffs in the decades 1910s, 1920s and 1930s

Note: The maps show standardized tariff intervals, in order to make the decades comparable to one another. Panel A shows the average tariffs for 1910-1919, Panel B shows the average tariffs for the interval 1920-1929 and Panel C shows the average tariffs for 1930-1939.

4. Empirical strategy

To identify the effect of excess deaths on the tariffs after the Spanish flu pandemic, we implement a difference-in-differences strategy. In this way, we obtain an estimate of the average treatment effect of excess deaths on tariffs. We hypothesize that the effect will start after the beginning of the first peak in 1918. Furthermore, we allow for the effect to take place before the end of the pandemic, because it is likely that affected countries took measures against the disease, one of which could be to become less open. These measures could have been implemented while the pandemic was still in progress. An advantage of this is that the time of treatment coincides with the end of the First World War, which is useful for our analysis.

To find the average treatment effect of excess deaths, we start by estimating the following difference-in-differences model

$$tariff_{it} = \beta_0 + \beta_1 post1918_t * lnexcessdeaths_i + \beta_2 post1918_t + c_i + \theta_t + \varepsilon_{it}, \quad (1)$$

where $tariff_{it}$ is the tariff level in year t for country i , $post1918_t$ is a dummy taking the value 1 for the years 1919-1939 and zero otherwise. Our main explanatory variable, $lnexcessdeaths_i$, is the log of excess deaths caused by the Spanish flu. The specification also includes country fixed effects, c_i , and year fixed effects, θ_t . The country fixed effects control for any time invariant characteristics of each country and are allowed to be correlated with the explanatory variables. ε_{it} is the error term clustered at the country level. Our main parameter of interest is β_1 , which gives us the average treatment effect.

As noted above, the end of the pandemic coincides with the end of the war, and thus a major concern in equation 1 is that we do not control for the war. Indeed, the above discussion makes it likely that countries experiencing the war more severely implemented higher tariffs afterwards. Therefore, for comparison, we also estimate the average treatment effect for the number of battle deaths during the war as:

$$tariff_{it} = \beta_0 + \beta_1 post1918_t * lnbattledeaths_i + \beta_2 post1918_t + c_i + \theta_t + \varepsilon_{it}, \quad (2)$$

where $\ln\text{battledeaths}_i$ is the natural logarithm of (1 + the number of deaths in battle) during the First World War. Note that only about half of the countries in our sample participated in the war and only these will have positive values in the number of deaths.¹⁰ This means that the number of battle deaths is only positive for these countries.

Finally, to assess the relative significance of our two treatments, we also estimate a version where both the pandemic and the war are included as follows:

$$\text{tariff}_{it} = \beta_0 + \beta_1 \text{post1918}_t * \ln\text{excessdeaths}_i + \beta_2 \text{post1918}_t * \ln\text{battledeaths}_i + \beta_3 \text{post1918}_t + c_i + \theta_t + \varepsilon_{it} \quad (3)$$

5. Results

Table 2 provides the results of estimating equations 1 to 3.

Table 2: Regression results

Dependent variable is: <i>tariff</i>	(1)	(2)	(3)
<i>after1918</i> × <i>lnexcessdeaths</i>	0.017*** (0.004)		0.008*** (0.002)
<i>after1918</i> × <i>lnbattledeaths</i>		0.004*** (0.001)	0.003*** (0.001)
<i>after1918</i>	-0.197*** (0.040)	-0.034** (0.011)	-0.117*** (0.030)
Year FE	Y	Y	Y
Country FE	Y	Y	Y
Observations	480	480	480
Number of countries	12	12	12

Note: Robust standard errors in parentheses, clustered at the country level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Despite few observations, we obtain significant results at standard significance levels. From column 1 in Table 2 it is clear that there is a positive correlation between the number of excess deaths and the

¹⁰ Denmark, the Netherlands, Norway, Spain, Sweden and Switzerland all remained neutral.

level of tariffs after 1918. We find that a 1 percent change in the number of excess deaths leads to a tariff increase equal to 0.017 percentage points. In terms of standard deviations, one standard deviation more excess deaths implies 0.022 percentage point higher tariffs, corresponding to an increase of one third of a standard deviation in tariffs. From column 2, it is also clear that the number of battle deaths in the First World War had an important effect on tariffs after 1918. On average, one percent more battle deaths results in 0.004 percentage points higher tariffs. In terms of standard deviations, the result is similar to excess deaths, given that one standard deviation more battle deaths implies 0.026 percentage point higher tariffs. It is thus clear that the effect of the war is also not negligible. However, in column 3 where both the effect of the pandemic and the effect of the war are estimated together, the estimate on *lnexcessdeaths* remains positive and significantly different from zero at the 1 percent level. The effect of excess flu deaths is in fact stronger than that of battle deaths when including both simultaneously. However, it should also be kept in mind that the number of battle deaths is zero for half of our sample. This, as well as the fact that excess deaths and participation in the war are correlated due to returning soldiers spreading the illness make it difficult to compare the size of the coefficients. These results together imply that the number of deaths in battle during the war alone was not the only important determinant of tariffs: a non-trivial determinant was indeed mortality during the Spanish flu.

A difference-in-differences model relies on the assumption of a common trend. This assumption states that, in the absence of treatment (the pandemic / the war), the difference in tariffs between the treatment group and the control group would be constant. In our case this implies that the difference in tariffs before and after 1918 would be constant between countries, had they not experienced the flu or the war. The common trend assumption can be tested by estimating a flexible differences-in-differences model, where *lnexcessdeaths* and *lnbattledaths* interact with year dummies including the pre-treatment period. The effect of the two variables is thus allowed to differ in each year. If the assumption holds, all estimates before 1918 should be insignificant, thus showing no trend prior to treatment. In this way, we can also determine when the effects died out, as we expect they might have done with the onset of the Great Depression. Due to a lack of observations, we cannot estimate both the impact of the war and the pandemic in the same regression in the flexible specification. The results can be seen in Figure 3.

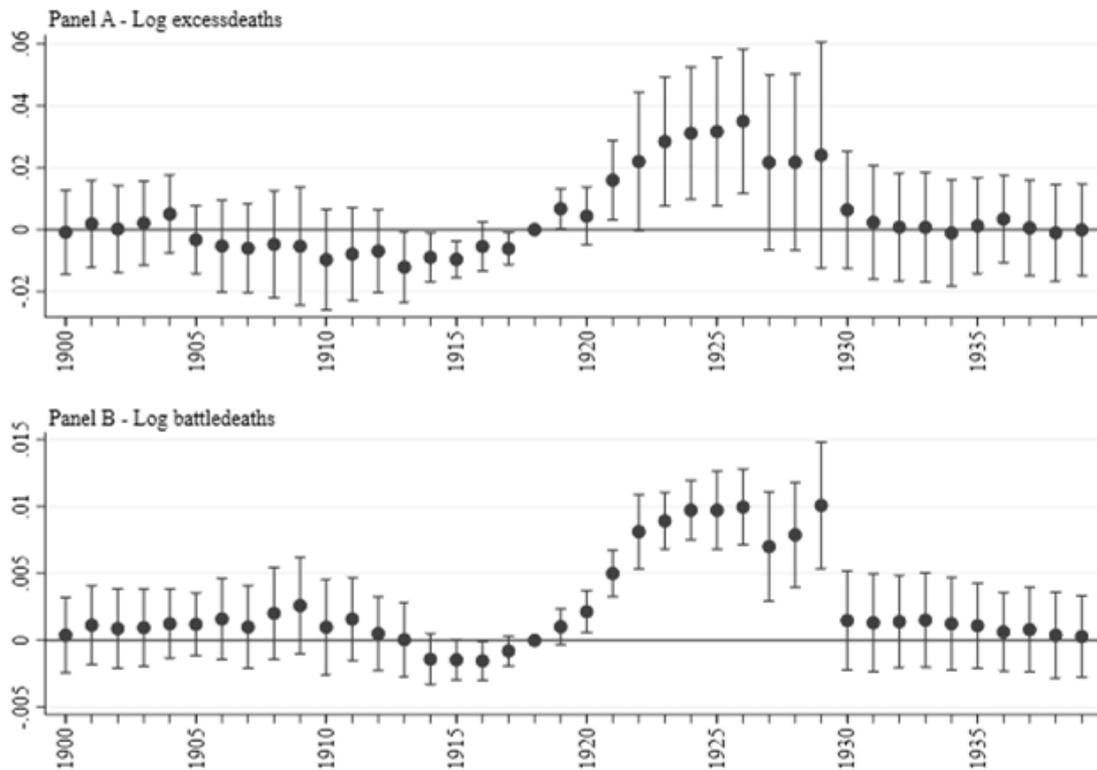


Figure 3: Estimated coefficients from a flexible model using $\ln excessdeaths$ / $\ln battledeaths$ as explanatory variable

Panel A shows the point estimates from a flexible difference-in-differences model with $\ln excessdeaths$ on $tariff$. Panel B shows the point estimates from a flexible difference-in-differences model with $\ln battledeaths$ on $tariff$. The base year is 1918 and the error bars show $p < 0.1$ based on robust standard errors, clustered at the country level.

For both the pandemic and the war, there is no clear pre-trend given that almost none of the coefficients are significantly different from zero before 1919. There are a few negative and significant coefficients for both excess deaths and battle deaths in the years during the war. The significant negative estimates during this period could simply reflect that countries participating in the war were more open then, since imports were fundamental for national supply, and countries participating in the war were more affected by the flu. Undoubtedly, the war period is unusual in many respects and it is thus reassuring that the only significant estimates before 1919 are during this period.

Thus, without any clear pre-trend, we can conclude that the assumption of a common trend holds. Moreover, Figure 3 reveals nicely that the coefficients become significant after 1918. As for Table 2, it is clear that both $\ln excessdeaths$ and $\ln battledeaths$ play a role in explaining the tariffs. The

effects from the pandemic seem to disappear earlier but, as expected, by the beginning of the 1930s all seem to have vanished. This is consistent with historical events. After 1929 and the Great Depression, countries started to become more protectionist for reasons which, ten years after both shocks, seem to have outweighed the previous determinants.

6. Conclusion

The impact of pandemics on trade policy is deserving of more attention. We find that it was not only the First World War which led to protection in the 1920s, but also the Spanish flu, and future analyses have the potential to add substantially to this preliminary work, for example by investigating the link to public health policy, which we might assume played a role for determining the severity of the outbreak. This provides an important new dimension to the debate today about the trade-off between the economic benefits versus the human costs of relaxing public health restrictions. It might be the case that the domestic benefits could to a substantial extent be offset by tendencies towards international isolationism.

For now, we offer this simple warning: policymakers and the media must take seriously the impact on isolationist policy that the present pandemic might unleash. It is a cliché, but if history teaches us nothing else, it is that we should be wary of making the same mistakes twice, and we should be cautious that the 2020s do not follow the pattern of the 1920s, if we are to avoid the turmoil the interwar period witnessed. We sincerely hope that our findings do not generalize.

References

- Ansart, S., Pelat, C., Boelle, P.Y., Carrat, F., Flahault, A. and Vallerona, A.J. (2009). “Mortality burden of the 1918–1919 influenza pandemic in Europe”, *Influenza and Other Respiratory Viruses* 3(3): 99–106.
- Arthi, V., Lampe, M., Nair, A., O’Rourke, K.H. (2020). The Impact of Interwar Protection: Evidence from India. *NBER Working Paper* 27178.
- Bootsma, M. C., & Ferguson, N. M. (2007). The effect of public health measures on the 1918 influenza pandemic in US cities. *Proceedings of the National Academy of Sciences*, 104(18), 7588-7593.
- Boyce, R.W.D. (1987). *British Capitalism at the Crossroads, 1919-1932: A Study in Politics, Economics, and International Relations*. Cambridge University Press.
- Broadberry, S.N., Harrison, M. (2005). *The Economics of World War I*. Cambridge University Press.
- Cagé, J., Gadenne, L. (2018). Tax revenues and the fiscal cost of trade liberalization, 1792–2006. *Explorations in Economic History* 70, 1-24.
- de Bromhead, A. (2018). Women voters and trade protectionism in the interwar years. *Oxford Economic Papers*, 70(1), 22-46.
- de Bromhead, A., Fernihough, A., Lampe, M., & O’Rourke, K. H. (2019). When Britain turned inward: The impact of interwar British protection. *American Economic Review*, 109(2), 325-52.
- Eichengreen, B., & Irwin, D. A. (2010). The slide to protectionism in the Great Depression: Who succumbed and why?. *The Journal of Economic History*, 70(4), 871-897.
- Feinstein C., Temin P., Toniolo G. (2008). *The World Economy between the Wars*. Oxford University Press.
- Findlay, R., O’Rourke, K. (2007). *Power and Plenty. Trade, War, and the World Economy in the Second Millenium*. Princeton, NJ: Princeton University Press.
- Hardach, K. (1977). *The First World War, 1914-1918*. London: Allen Lane.
- Jordà, Ò., Schularick, M., & Taylor, A. M. (2017). Macrofinancial History and the New Business Cycle Facts. In Eichenbaum, M., Parker, J. A. (eds.), *NBER Macroeconomic Annual 2016*,

volume 31, Chicago: University of Chicago Press.

- Harley, C.K. (2020). "Trade from the Voyages of Discovery to the First World War", *Oxford Research Encyclopedia of Economics and Finance*.
- Hatchett, R. J., Mecher, C. E., & Lipsitch, M. (2007). Public health interventions and epidemic intensity during the 1918 influenza pandemic. *Proceedings of the National Academy of Sciences*, 104(18), 7582-7587.
- Lampe, M., & Sharp, P. (2013). "Tariffs and income: a time series analysis for 24 countries", *Econometrica*, 7:207-235.
- Morys, M. (2014). Cycles and depression. In Floud, R., Humphries, J., Johnson, P. (eds), *The Cambridge Economic History of Modern Britain: Volume 2, 1870 to the Present*. Cambridge: Cambridge University Press, 229-254.
- O'Rourke, K. H., & Williamson, J. G. (1999). *Globalization and history: the evolution of a nineteenth-century Atlantic economy*. MIT press.
- Przeworski, A. (2009). Conquered or granted? A history of suffrage extensions. *British Journal of Political Science*, 39(2), 291-321.
- Sarkees, M. R. and Wayman, F. (2010). *Resort to War: 1816 - 2007*. Washington DC: CQ Press.
- Spinney, L. (2018). *Pale Rider: The Spanish Flu of 1918 and How it Changed the World*. London: Vintage.
- Wolcott, S. (1991). British Myopia and the Collapse of Indian Textile Demand. *Journal of Economic History* 51(2), 367-384.

Appendix 1 - Regression results excluding Germany from the sample

Table A1: Regressions results excluding Germany

Dependent variable is: <i>tariff</i>	(1)	(2)	(3)
<i>after1918</i> × <i>lnexcessdeaths</i>	0.015** (0.005)		0.008** (0.003)
<i>after1918</i> × <i>lnbattledeaths</i>		0.003** (0.001)	0.003** (0.001)
<i>after1918</i>	-0.180*** (0.045)	-0.030*** (0.011)	-0.110*** (0.035)
Year FE	Y	Y	Y
Country FE	Y	Y	Y
Observations	440	440	440
Number of countries	11	11	11

Note: Germany has been excluded from the sample. Robust standard errors in parentheses, clustered at the country level.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

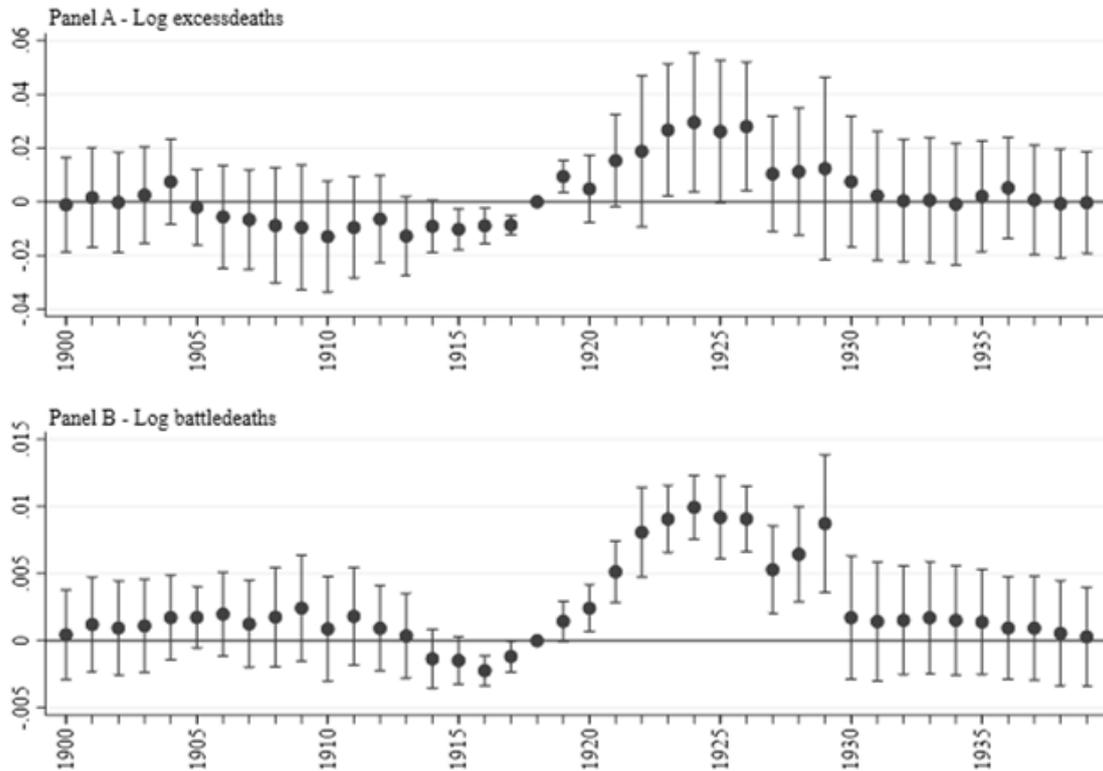


Figure A1: Estimated coefficients from a flexible model using $\ln excessdeaths/\ln battledeaths$ as explanatory variable with Germany excluded from the sample

Panel A shows the point estimates from a flexible difference-in-differences model with $\ln excessdeaths$ on $tariff$. Panel B shows the point estimates from a flexible difference-in-differences model with $\ln battledeaths$ on $tariff$. The base year is 1918 and the error bars show $p < 0.1$ based on robust standard errors, clustered at the country level.