University of Nottingham
UK | CHINA | MALAYSIA

research paper series

Political Economy and Globalisation Programme

Research Paper 2020/13

Trade disruption, industrialisation, and the setting sun of British colonial rule in India

Roberto Bonfatti and Björn Brey

Trade disruption, industrialisation, and the setting sun of British colonial rule in India*

Roberto Bonfatti (Universities of Padua and Nottingham)†
Björn Brey (University of Nottingham)‡

This Version: November 11, 2020

Abstract

Colonial trade encouraged colonies specialization in primary products. Did this prevent industrialisation in colonies? And did the absence of industrialisation help to keep colonies under control? To answer these questions, we examine the impact of the temporary trade collapse between Britain and India due to World War I, on industrialisation and anti-imperial feelings in India. Exploiting cross-district variation in exposure to the trade shock, we find that districts more exposed to the trade shock experienced substantially faster industrial growth in 1911-21, placing them on a higher level of industrialisation which persisted up to today. Using the WWI trade shock as an instrument for industrialisation levels, we also find that more industrialised districts were more likely to express anti-imperial feelings in 1922, and to vote for the Indian National Congress in the landmark election of 1937.

JEL Classifications: F14, F54, O14, N65.
Keywords: Colonial trade, India, Infant-industry argument, Decolonisation.

*Without implication, we would like to thank David Atkin, Kirill Borusyak, Mateo Uribe-Castro, Jonathan Dingel, Giovanni Facchini, Giovanni Federico, James Fenske, Roberto Ganau, Sanjeev Goyal, Cong Liu, Gerard Padró i Miquel, Alex Moradi, Douglas Nelson, Andrés Rodríguez-Clare, Kevin O'Rourke, Vikram Pathania, Andrei Potlogea, Sandra Sequeira, Gabriel Ulyssea, and Brian Varian, as well as seminar and conference participants at the University of Nottingham, the University of Padua, the University of Oxford, the 18th GEP/CEPR post-graduate conference, the 2019 CESifo Area Conference on Global Economy, the 7th CEPR Economic History Symposium and 5th Banco de Espana Economic History Seminar, the Barcelona GSE 2019 Summer Forum on Geography, Trade, and Growth, the 2019 InsTED Annual Conference, the 2019 NEUDC Conference, and the 2019 Midwest Empirical Trade conference. We would also like to thank Sandy Hunter for outstanding research assistance and Katie Harrison for editorial assistance. Bonfatti gratefully acknowledges financial support from the Nottingham School of Economics, and the Department of Economics of the University of Padua. Brey gratefully acknowledges financial support from the Vice-Chancellor's Scholarship for Research Excellence, and the Nottingham School of Economics.

†Roberto Bonfatti: roberto.bonfatti@unipd.it
‡Björn Brey: bjoern.brey@nottingham.ac.uk

1 Introduction

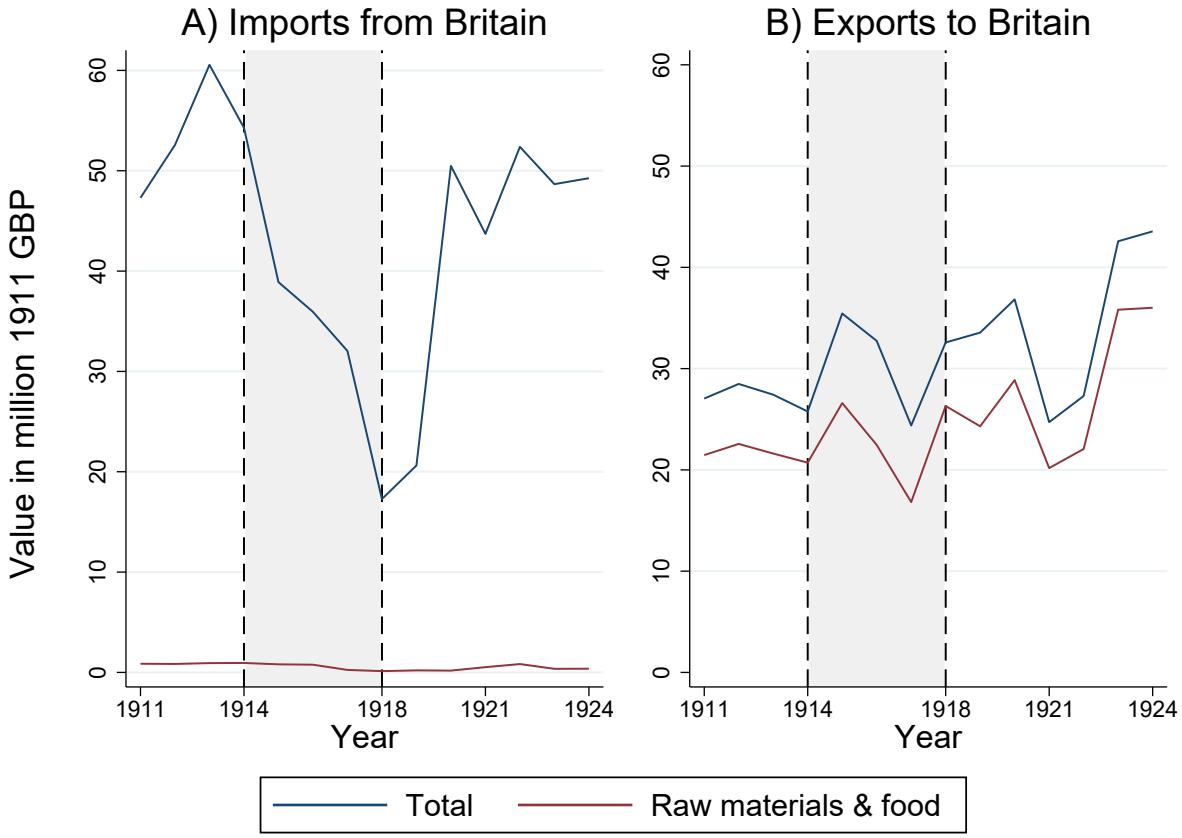
One common feature of European empires was the prominence of trade between the colonies and the imperial powers (Mitchener & Weidenmier 2008). This resulted in a pattern of specialisation whereby the colonies exported mainly primary products, and imported mainly manufactures. The imperial powers encouraged this specialisation, which simultaneously benefited their consumers of primary products, producers of manufactures, and investors in colonial plantations and mines. From the point of view of the colonies, however, two questions arise: did colonial trade prevent industrialisation in the colonies? And did it help keeping them under control, by making them dependent on trade with the imperial power?

We attempt to answer these questions empirically, in the context of early 20th century colonial India. The paper is divided into two parts. In the first, we exploit the collapse in trade generated by World War I - which, as shown in Figure I, more than halved Indian imports from Britain in real terms - to investigate the impact of an exogenous interruption in colonial trade (from now on, the "WWI trade shock") on industrial growth in India. In the second part, we investigate the impact of industrialisation levels on support for the anti-colonial movement in the 1920s and 1930s, using the WWI trade shock as an instrument for industrialisation levels.

This historical setting is well suited for what we intend to study, for three important reasons. First, India was exposed to unconstrained free trade in the second half of the 19th and early 20th centuries, which was associated with one of the most spectacular episodes of international specialisation in history (whereby Britain became the "workshop of the world", while India, once an important producers of manufactures, progressively de-industrialised). Second, many commentators have blamed colonial trade as one of the main reasons for India's poor industrial performance. Finally, WWI generated a large and exogenous interruption in colonial trade, allowing us to identify the impact of colonial trade on industrial growth. Importantly, the shock was also temporary. This allows us to investigate the persistence of its impact, and thus attempt to discriminate between alternative channels through which colonial trade may have affected industrial growth.

To discriminate between channels is important, because different channels have potentially different welfare implications. In a static trade model, a colony with a comparative advantage in primary products will benefit from trade, even though this will be associated with poor industrial performance. In contrast, in a dynamic model – featuring for example learning externalities, such as in the infant industry model – poor industrial performance might be welfare-decreasing (though it does not need to be). To adjudicate between the two cases, we take advantage of the fact that they have opposite predictions for the impact of a temporary trade shock. In particular, if the static trade model best describes colonial India, then the WWI trade shock should have had, at most, a temporary effect on Indian industry. In contrast, if the dynamic model is most appropriate (for example, if learning externalities were important), then the WWI trade shock

Figure I
Trade between India and Britain in real terms



Notes: Indian imports from and exports to Britain in our 105 traded sectors, in 1911 GBP. From 1923 the Irish Free State is no longer included in British imports and exports. Source: Annual Statement of the Trade of the United Kingdom

should have had a persistent effect. Motivated by these considerations, we specifically look for persistent long-run effects of the WWI trade shock on Indian industry.

In the first part of the paper, we investigate the link between exposure to the WWI trade shock and industrial employment growth across up to 235 Indian districts. We proceed in three steps. First, we compare product-level data on Indian net exports to Britain in 1913 and 1917 (the last full year of peace and war, respectively) to construct a product-level measure of exposure to the WWI trade shock, for India as a whole. Second, following Autor et al. (2013), we match this product-level measure to district-industry-level employment data for 1911, to construct a district-level measure of exposure to the WWI trade shock. Such measure attributes a high exposure to districts which, in 1911, employed many people in sectors which, between 1913 and 1917, witnessed a large increase in net exports. Finally, we regress district level industrial employment change from 1911 to various years between 1921-2011 on exposure to the WWI trade shock.

Consistent with a dynamic model of trade and industrialisation, we find that the WWI trade shock had a positive, large and highly persistent effect on Indian industry. Districts exposed to a greater 1913-17 increase in net exports to Britain experienced faster industrial employment growth in 1911-21. This placed them on a higher level of industrial employment which was still visible in 1926, 1936, 1951 and 2011 (the year of the last census). Net exports increased on average, so that the WWI trade shock is estimated to have had a positive effect on Indian industry. The impact of the shock was large: it accounted for between 29% and 40% of industrial employment growth in 1911-21, and for 4.4% of growth in 1913-2011. While long-run persistence might partly be driven by later shocks, we argue that persistence until at least 1936 was mainly driven by the WWI trade shock. These results imply that colonial trade did help to prevent industrialisation in India. Furthermore, the persistent effect of the WWI trade shock suggests to look at this through a dynamic model of trade and industrialisation, within which free trade can be welfare decreasing.

When we explore this further, we find some evidence that persistence was due to learning, and not to competing explanations (such that industries who benefited more from the WWI trade shock later expected or obtained a more favourable industrial policy, or that they experienced looser credit constraints due to war-time profits). First, the effect was entirely driven by variation in net exports of manufactures (as opposed to industries processing primary products), which in turn was dominated by a fall in imports. While manufacturing is where learning externalities should be more important, the effect on credit constraints might be expected to be similar in the two cases. Second, the WWI trade shock boosted the employment of Indian managers but not that of British managers, and the number of firms owned by Indians but not those owned by Britons. While both nationalities might have benefitted from a more favourable industrial policy, the former presumably had more to learn on how to operate a modern industrial firm. Finally, districts more exposed to the WWI trade shock experienced a temporary increase in the number of workplace accidents, which however returned to pre-WWI levels by 1921. A plausible interpretation of these results is that it took time for new unskilled workers to learn how to operate the machines safely.

In the second part of the paper, we investigate whether more industrialised districts lent greater support to the anti-imperial movement in the 1920s and 1930s. This analysis is based on a classical argument on the role of commercial versus industrial colonial groups in supporting or opposing imperialism (see Markovits 2002, p.24), which has been reformulated recently by Bonfatti (2017). The argument is the following: Due to Empires having been trade-enhancing institutions, trade disruption were one of the costs of rebelling against them. However, such disruption would have affected different colonial groups differently. For commercial groups, involved in the export of primary products to the imperial power, trade disruption would have implied a cost. In contrast, for industrial groups involved in import substitution, it might have even implied a gain. Thus, commercial groups should support the empire, while industrial groups should oppose it. It follows that greater colonial industrialisation, by making the in-

dustrial groups more influential, should make a colony more rebellious. Within India, more industrialised districts should lend greater support to the anti-colonial movement.[1]

We measure support for the anti-colonial movement at two key dates in the history of the movement: 1922 and 1937. The first year marked the end of the Non-Cooperation Movement of the Indian National Congress (INC). This was Ghandi's first attempt to resist British rule through non violence. In the summer of that year, the INC conducted an internal survey asking local party members how in favour they were of immediate civil disobedience against Britain. We observe the responses of up to 252 party members, located all over India. Our first measure of support for the anti-colonial movement will be the average response of INC members in a district. Fifteen years later, the INC had become the mass political party that would eventually lead the country to independence in 1947. The 1937 provincial election was the first to be held on a significant franchise, and also the first to be contested by the INC with full force. The result was a landslide for the INC, which formed governments in a majority of provinces. Our second measure of support for the anti-colonial movement will be the share of seats won by the INC in a constituency (a sub-division of a district).

Instrumenting for industrialisation levels in 1921 and 1936 using the WWI trade shock, we find that more industrialised districts featured stronger support for civil disobedience in 1922, and were more likely to elect an INC representative in 1937. A one percentage point increase in the industrial employment share is estimated to result in a 54% stronger support for civil disobedience in 1922, and a 6% higher probability of electing an INC representative in 1937. These large effects suggest that, although the INC's success in achieving independence was ultimately due to its capacity to mobilise the rural masses after the Great Depression, industrialisation levels had an important impact on support for the anti-colonial movement. The change in support of the rural masses was required due to the continued low levels of industrialisation in colonial India. Our results also imply that colonial trade did help to keep India under control: the interruption in trade which occurred in 1913-17 is estimated to have resulted in 6.8% stronger support for civil disobedience in 1922, and to have increased the number of seats won by the INC in 1937 by 2.4%.

In summary, our results suggest that colonial trade did help to prevent industrialisation in India, as evidenced by the fact that its interruption in 1913-17 led to a period of faster industrial growth and to a persistently higher level of industrialisation. The persistence of the effect highlights the importance of looking at colonial trade through a dynamic model, within which free trade can be welfare-decreasing for the colony. At the same time, colonial trade did help to keep India under control, as shown by the fact that its interruption in 1913-17, by leading to higher industrialisation levels, also led to stronger support for the anti-colonial movement in the 1920s and 1930s.

[1]Of course a district could not rebel on its own, but it could attempt to influence national politics in favour of rebellion.

Our results have important implications. First, they suggest that the trade which took place within the European empires, while modernising the colonies in many respects, may have had a negative impact on the long-run growth of some of them. Second, our results provide a new way to rationalise the wide range of anti-industrial policies that the European colonisers adopted in their colonies in this period (O'Rourke & Williamson 2017, p.7). To the extent that industrialisation would encourage rebellion, it was in the imperial power's interest to discourage industrialisation. Finally, our result may explain why the imperial power that industrialised fastest, Britain, was also most successful at constructing and maintaining a colonial empire: its industrial growth boosted trade with the colonies, which in turn helped to keep the colonies under control.

This paper is related to the economics literature on the infant industry argument, which has highlighted the importance of a dynamic learning process in industrialisation at least since John Stuart Mill (see Kemp 1960). The first formal model of the infant industry argument with learning externalities was provided by Bardhan (1971), while the most recent literature has explored more general or alternative settings (for a literature review, see Melitz 2005). Empirically, the literature has mostly tried to estimate the effects of policy-created trade protection by using partial equilibrium models to calculate the counterfactual of no-protection (see the literature review in Juhász 2018). The endogeneity of protection is clearly an issue in this literature. In an innovative recent paper, Juhász (2018) addresses this issue. She studies the effect of exogenous protection resulting from the Napoleonic Wars of 1803-1815 on the adoption of mechanised cotton-spinning in France. She finds that protection had a positive effect on technology adoption and value added per worker, both in the short-run and in the long-run. A second important contribution in this vein is Liu (2020). Using an identification strategy similar to Juhász (2018), she studies the impact of the WWI trade shock on textile manufacturing in China.[2] She finds that the shock induced firm entry, though this was delayed by a few years due the difficulty to import machinery during the war. The results presented in the first part of our paper extend on those in Juhász (2018) and Liu (2020), as we use a different identification strategy and look at a broader set of industries, which allows us (among other things) to distinguish the effect of the disruption to trade on producers of primary products and manufacturers.[3] Further in contrast

[2]To the best of our knowledge the only other paper on the trade shock effect of WWI is Fuchs (2018), who looks at the effect of increased demand for manufactures from belligerent countries on Spanish industrialisation and regional inequality.

[3]In Juhász (2018), the heterogeneous exposure of French departments to the trade shock is due to their geographical location, and the fact that the Continental Blockade made it more difficult for some region of France to import from Britain than for others. Instead, we follow Autor et al. (2013) in constructing a measure of exposure that varies across Indian districts due to their initial industrial specialisation. Methodologically, we are close to the literature on trade liberalisation and deindustrialisation/political polarisation started by Autor et al. (2013)

to these papers, we study a colony, and the impact of colonial industrialisation on anti-imperial feelings.

This paper is also related to two papers on how international trade shaped the colonial independence movements; the afore mentioned Bonfatti (2017), and Bhavnani & Jha (2018). Bhavnani & Jha (2018) is, to an extent, a precursor to our paper. They analyse the link between the 1923-1933 drop in Indian exports caused by the Great Depression, and support for the INC across Indian districts. Their analysis focusses on the price decline in agricultural exports, which negatively affected rural producers of primary products, who according to the theory in Bonfatti (2017) should be a group in favour of empire. They find that districts with medium exposure to the drop in exports were those that provided the strongest support for the INC. They explain this by arguing that it was precisely in these districts that producers of primary products turned away from exporting, thus losing an economic motivation for supporting the empire. We add to the results in Bhavnani & Jha (2018) in two important ways. First, we establish the impact of an earlier shock to trade, which was mainly driven by a drop in Indian *imports*, on industrial growth in India. This allows us to comment on the role of colonial trade in promoting, or preventing, economic development in a colony, something which Bhavnani & Jha (2018) do not do. Secondly, we take advantage of the fact that our shock provides an exogenous source of variation in the industrial employment share, to identify the causal link between industrialization and anti-imperial feelings. This complements the results in Bhavnani & Jha (2018), providing a complete picture of the role of colonial trade in shaping anti-imperial feelings in India.

Our paper has implications for how colonial trade policy affected industrial growth in India, thus is related to the literature on the economic legacy of colonialism. However much of that literature has focused on institutions, and on the very long run (e.g Acemoglu et al. 2001, Dell 2010), while we study the economic forces unleashed by colonial trade policy at the time. A similar focus on historical effects is in Donaldson (2018), who studies the welfare effect of the construction of the railways in colonial India. Dell & Olken (2020) study the economic forces unleashed in Indonesia by the production of sugar for export in the 19th century. Areas close to historical sugar factories are today more industrialised, and people tend to have higher levels of education and incomes. Dell & Olken (2020) explain this persistence through agglomeration forces and infrastructure investment that the production of sugar generated.[4] We instead focus on imports in colonial times, and the competition they generated for colonial manufacturers.

---

and Autor et al. (forthcoming). However we also depart from that literature substantially, in that we apply their method to a very different setting (a temporary drop in trade, in a colony) and to study a very different object (early-stages industrialisation, and anti-imperial feelings).

[4]Jedwab also show that colonial railroads persistently affected the distribution and aggregate level of economic activity in Africa.

The paper is organised as follows. Section 2 provides some historical background. Sections 3 and 4 describe our empirical approach, and how we collected and prepared the data. Sections 5 and 6 present our results on, respectively, industrialisation and political outcomes. Section 7 summarises our results and draws conclusions.

2 Historical Context

As in a classical colonial setting, India exchanged mostly primary products for manufactures (Figure I) at the start of the 20th century, and most of its trade (especially its imports) was with Britain, its imperial power (see Figure A.1 in the Appendix).[5] This was the result of a century-long process of deindustrialisation: a dominant producer and exporter of handcrafted cotton textiles until the 18th century, India was outcompeted by the industrial revolution in Britain (e.g. Gupta & Roy 2017, pp.230-31). As Britain industrialised and India de-industrialised, trade between the two expanded, and so did British colonial rule over India.

As the technologies of the industrial revolution spread around the world in the second half of the 19th century, Indian industry began to grow at what was actually a remarkable rate in comparison to other colonies in Asia or Africa. The main developments were the jute textile industry by British interests in Calcutta in the 1860s and 70s, and the cotton textile industry by indigenous business men in Bombay and Ahmedabad in the same period (a "probably unique" event in colonial economic history, Markovits 2002, p.8). Employment in large-scale industry grew from around 100,000 in 1860 to around 2 million in 1940, and the real output of manufacturing industries increased at a rate of 5.16% between 1900 and 1944 (Sivasubramonian 1997, p.140). Throughout this period, cotton and jute textiles remained the dominant sector, with iron & steel also becoming important after WWI. India accounted for 55 per cent of cotton spindles installed outside Europe, North America and Japan in 1910, and was, next to Britain, the world's greatest exporter of cotton yarn.[6] It also accounted for 50 per cent of the remaining steel produced in 1935 (Gupta & Roy 2017, p.232; Morris 1983, p.600-40).

Despite this relative success, large-scale industry remained a tiny share of the economy, and was outperformed not only by sovereign countries at a similar initial level of development, such as Japan, but also by more independent colonies such as Canada, Australia and New Zealand, and even by a dependent colony such as Korea. Wolcott & Clark (1999) estimate that Japanese labour productivity in cotton spinning increased five-fold between 1890-94 and 1935-38, while Indian productivity essentially stagnated. In Korea, the annual rate of growth of industry (including manufacturing and mining) was nearly 10% between 1910 and 1940 (Kohli 2004, p.48).

[5]India's main imports were cotton textiles, steel and iron products and machinery, while her main exports were tea, fibres, leather, raw cotton and fibre fabric (see Figure A.2) in the Appendix.

[6]China was an especially important foreign market.

There is a long-standing view that blames the lacklustre industrial performance of India (and other dependent colonies) on colonial policy, but not everyone agrees with this. Many sovereign countries and independent colonies used protective tariffs in the late 19th century, and this was typically associated with faster industrial growth (Lehmann & O'Rourke 2011). In contrast, most colonies in Asia and Africa were more open to imports, and subject to a range of colonial policies that damaged their manufacturing growth (Tena-Junguito 2010, p.114-5; O'Rourke & Williamson 2017, p.7). In India, British *laissez-faire* meant that the country remained wide open to imports (from all sources, not just Britain) until essentially the end of the 1920s. At the same time, the British fell short of providing the active industrial policy that the Japanese provided in Korea, and actively discriminated against Indian manufactures in government purchases (Kohli 2004; Tomlinson 2013, p.113). According to Bagchi (2000), these policies were largely responsible for India's poor industrial performance. However, not everyone agrees. For example, Roy (2002) argues that it was the scarcity of capital and skilled labour that held Indian industry back, while Wolcott (1994) and Wolcott & Clark (1999) argue that the reason why India underperformed Japan in textiles (and possibly other industries) is to be found in specific features of the Indian labour market.[7]

If historians cannot agree, the Indian nationalists of the time were of one mind in blaming Britain for India's backwardness. India was still under direct British rule on the eve of WWI, and various nationalist movements had formed to demand more autonomy. Among these was the Indian National Congress (INC). Founded in 1885 as a party of the urban elite, the INC progressively transformed into the mass party which would lead India to independence in 1947. There was much heterogeneity in the nationalists' strategies and goals, and the INC itself was internally divided. But one thing they had in common was the blame they assigned to British manufactures for having de-industrialised India, and the determination to secure some sort of protection against them (Clingingsmith & Williamson 2008, p.210). Indeed, even the limited protection that India obtained during the interwar years, while decreasing total imports, substantially boosted the import of British manufactures (Arthi et al. 2020).

Unexpectedly, WWI provided such protection, though this was only a temporary event. Imports of British manufactures collapsed in real terms, reaching a low point in 1918 (Figure I). This was reinforced by the prohibition to import from the Central Powers, most notably Germany, and was only partially alleviated by an increase in imports from war-allies such as Japan and the USA (see Online Appendix Figure A.1).[8] The collapse in imports from Britain was due to Britain's shift from production for export markets to production for the war effort (Morris 1983, p.600). Indeed, the greatest decline happened in war-related industries, such as steel,

[7]According to Morris (1983), pp.554-5 and 607-40, industrialisation held back by scarce domestic demand, due to the low per capita income, a low degree of monetisation of the economy, and the lack of industrialisation itself.

[8]Total imports remained roughly constant in nominal terms, but collapsed in real terms.

iron and copper products, and locomotives (see Online Appendix Figure A.2). Increasing trade costs, due to military utilisation of shipping capacity and an unrestricted German submarine warfare from late 1916, must have also played a role. Once the war was over, real imports of British manufactures rebounded rather quickly, though they remained below the 1913 peak (Figure I).

When it comes to Indian exports, WWI had a mixed effect. Industries in high war-related demand such as leather, fibre (jute) fabric and flour, did well, while other industries such as raw cotton, sugar and timber, did poorly (see Online Appendix Figure A.2).

WWI also had non-trade effects on the Indian economy, due to recruitment, increased government demand for Indian products, and casualties. India sent almost a million Indian troops overseas, to fight or serve as noncombatants behind the Allied lines. For Punjab (the province which contributed most to the Indian army), Vanden Eynde (2016) finds that recruitment led to a significant rise in literacy in the recruitment grounds, most likely due to informal learning by serving soldiers. India's participation to the war effort also meant a greatly expanded public expenditure in the colony. The government of India paid for the soldiers it sent abroad, and must have therefore scaled up demand for locally-produced equipment. More generally, India became the supply centre for all Allied operations east of Suez (Morris 1983, p.600). An industrial commission was appointed in 1916 to survey the subcontinent's industrial resources and potential, and in 1917 a munitions board was created to accelerate the production of war materiels. By the end of the war, the munitions board played a huge role as a purchaser of industrial products (Lockwood 2012, p.37).[9] While this increased public demand for Indian products was in part a manifestation of the trade shock – the colonial government purchased locally what would have normally been imported from Britain – total public demand clearly increased. Finally, India reported around 75 thousand combat casualties, though this was dwarfed by the almost 14 million who died in the 1918-19 influenza pandemic (Chandra et al. 2012).

It has long been argued that the WWI trade shock had a positive effect on import-competing industries in India (and in other peripheral countries as well),[10] though this was initially constrained by the scarcity of imported inputs and machinery.[11] During the war, *THE Madras Times* wrote: "as far as the development of industries in India is concerned, the longer the war lasts the

[9]For example, the Tata Iron and Steel Company began to receive Indian government support once the war started, and by 1916 was producing 100,000 tons of steel per year (Lockwood 2012, p.37; Gupta & Roy 2017, pp.240-41).

[10]Litman (1926) already noted that the war had considerable stimulated the industrialisation of economically backward countries. He explicitly cites Japan, China, India, Brazil, Canada, Australia and Argentina.

[11]On the contrary some *domestically* produced inputs, such as raw jute and cotton yarn, were made more abundant by the war, thus further supporting the growth of industry (Morris 1983, pp.601-7).

better. As soon as it is over, the flood of foreign goods will revive" (Lockwood 2012, pp.41-42). Morris (1983) argues that "As a consequence of wartime shortages and necessities, a variety of things were manufactured in India that had never been produced before [...]". Initially, Indian industries struggled to expand, as they lacked the raw materials, chemicals, machinery and spare parts normally imported from Britain or Germany. Skilled workers were also in short supply. In the second half of the war, however, they managed to overcome some of these constraints, by hiring more labour and working the machines around the clock. The real boom came in the aftermath of the war, as imports of replacement machinery boomed (Chaudhuri 1983, p.838) and the huge profits made by pre-existing firms attracted a flurry of investment (Gupta & Roy 2017, p.241; Morris 1983, pp.601-7). In a key industry like cotton textiles, the post-war boom was sustained by the fact that the British cotton textile industry took quite a few years to get back on its feet (Wolcott 1991).

It has also been argued that the war had *long-lasting* effects on industries in India (and other peripheral countries),[12] for three main reasons. First, some of the industries that expanded during the WWI boom learnt how to be competitive even in normal times, and progressively replaced imports in the 1920s.[13] The main examples are iron and steel, parts of the cotton textile industry, and cement (Morris 1983, pp.600-40).[14] Second, the attitude of the colonial government towards Indian industry became more benevolent in the inter-war period, for both military and political reasons.[15] The main implications were that the share of Indian products in public purchases progressively increased in the 1920s and 30s, and protective tariffs became available for selected industries from 1929 onwards (1924 for iron and steel).[16] But according to Tomlinson (2013), p.113, these changes were not large enough to represent a major new economic strategy. Finally, the WWI boom contributed to establishing the industrial dynasties

[12]Again, Litman (1926), p.25, notes how industrial developments in the periphery during WWI (and particularly their greater capacity to produce coarser manufactures) had a permanent effect on the composition of the manufacturing exports of the leading industrial countries.

[13]Other industries, such as chemicals, railway wagons and agricultural implements were less successful. According to Morris (1983) this was largely due to the lack of domestic demand, which in turn was due to the slow pace of industrialisation.

[14]The iron and steel industry (essentially the Tata Company) could only survive thanks to protection from 1924 onwards, but this was largely due to the collapse in the international price of steel in those years (Morris 1983, pp.624-32).

[15]British officials realised that "[...] victory in Mesopotamia had been possible only thanks to rail provided by the Tatas" (Markovits 2002, p.11). At the same time, public opinion in India increasingly asked for an active industrial policy in the inter-war period (Tomlinson 2013, p.111-4).

[16]There was also a rise in revenue tariffs in the 1920s, with only mild protective effect (Tomlinson 2013, p.112; Wolcott 1991, p.3).

which led the industrial development of India in the last thirty years of British rule (such as the Birlas and the Tatas). For these families, the large profits made during WWI were instrumental in allowing them to diversify into new industries in the 1930s and 1940s (such as sugar, paper, shipping, textile machinery, domestic airlines, and sewing machines).[17]

WWI also strengthened Indian nationalism, both as a result of indignation at Britain's behaviour after the war, and by laying the basis for greater frictions between Indian businessmen and the colonial government. During the war, Britain had promised to give India "dominion status", a position of substantial independence enjoyed by former colonies such as Australia and Canada. At the end of the war, however, it only conceded a partial transfer of power and a limited franchise, and ruthlessly repressed demonstrators.[18] Indian nationalism was stirred up by this, and the INC was no exception. WWI also created the basis for a growing rift between Indian businessmen and the colonial government.[19] Until the early 20th century, India's leading businessmen were mainly merchants, who benefited from the market opportunities offered by the British empire. However, as industrial investments became more important, clashes with the colonial government became more frequent (Markovits 2002, p. 9-10).[20] The main elements of discontent were the scarcity of protective tariffs, the overvaluation of the rupee in the 1920s and 1930s, and, from the late 1930s onwards, the role of foreign capital. WWI accelerated this process for two reasons: it increased the relative importance of industrial investments, and it raised the policy expectations of Indian businessmen, who during the war had come to believe that the colonial government would provide greater support to Indian industry in the future.

The INC began mass mobilisation shortly after WWI and went through a series of successes and setbacks before conquering power in the 1937 election, and then independence ten years later. The *non-cooperation movement* of 1920-2 was Gandhi's first attempt to deploy in India his famous methods of passive resistance. It comprised a boycott of elections as well as of British goods, education, courts, and honours to obtain dominion status within the British Empire. However, it failed after turning violent in February 1922, and it wasn't until the early 1930s

[17]See Tomlinson (2013), p.120. WWI generated both industrial profits and profits from speculation on basic commodities (Markovits (2002), p.11).

[18]These reforms led to the 1920 election, in which members of the central Imperial Legislative Assembly and Council of State were elected, as well as members of the Provincial Legislative Councils. In 1919, rising tension in the Punjab led to the Jallianwalla Bagh massacre, in which hundreds of demonstrators were shot dead by the army.

[19]While creating large fluctuations in prices that affected the life of the peasants, the WWI trade shock does not seem to have had as big an impact on peasants' support for the INC as the Great Depression. The latter greatly contributed to making the INC a mass party with a strong rural support (Rothermund 1992).

[20]It was over cotton textiles that the first significant clash emerged in 1895 (Markovits 2002, p. 9).

that Gandhi could start a new campaign, this time aimed at full independence. The two Civil Disobedience movements of 1930-1 and 1932-4 were successful in mobilising the rural masses hit by the Great Depression (see Rothermund 1992 and Bhavnani & Jha 2018), but failed to extract significant concessions from the colonial government. Nevertheless, the India Act of 1935 devolved some powers to the provinces, and significantly enlarged the franchise. The INC participated in the 1937 provincial election, reporting a landslide.[21] It stayed in power until 1939, when it resigned in protest against India's participation to World War II. Gandhi was then incarcerated and almost died fasting in prison, but was eventually released and led the INC to another sweeping victory in the 1946 election. Exhausted by the war effort, Britain agreed on India's independence in 1947. In the years that followed, the partition of British India into India and Pakistan led to a refugee crisis and mass violence.

Indian big business became increasingly close to the INC in the 1920s and 1930s, as their dissatisfaction with the colonial government increased, and the INC managed to distinguish itself from a radical working-class movement. Initially, businessmen saw the INC mainly as an instrument of political pressure, as the expectation of a more benevolent government policy advised them against a complete alignment with the nationalist movement. Later, however, as the colonial government did not concede what they wanted, their support for the INC increased (e.g. Markovits 2002, p. 37; Kohli 2004, p. 253).[22] Even though the Great Depression did not hit industry as badly as the rest of the Indian economy,[23] it had the effect of further alienating the industrialists from the government, whose policy they saw as the main cause of the depression (Markovits 2002, p. 75). Big business largely supported the first Civil Disobedience movement of 1930-1, though its eventual failure created a split between pro-INC and anti-INC businessmen.[24] But as tensions with the government rose again, and businessmen realised that, without the INC, they had no way to pressurising the government, they returned to back the INC in the 1937 election. After this the alliance between big business and the INC was solid-

[21] It won an absolute majority in six of the eleven provinces, emerged as the single largest party in Bombay and Assam, and fared badly only in the three predominantly Muslim provinces of Bengal, the Punjab and Sind (in which it nevertheless won most of the general non-Muslim seats).

[22] According to Markovits (2002), pp. 11 and 116-9, the colonial government was constantly preoccupied with trying to prevent the businessmen from joining the nationalist camp, but was limited in what it could do by the lobbying of British interests in London.

[23] While the contraction of internal demand was relatively small, due to the low initial purchasing power of the rural population and the rising real wages in the cities, Indian industry benefited from falling foreign competition and the drop in the price of raw materials (Markovits 2002, p. 41-2).

[24] Most notable on the anti-INC front were the Tatas, whose steel factories benefited more than anyone else from government purchases.

ified, and survived throughout World War II despite the vast opportunities that the war opened to Indian capitalists (Markovits 2002, pp. 72, 80, 94, and 183). Crucial to this alliance was the INC's capacity to appear moderate at critical junctures. For example, the INC's anti-socialist resolution and moderate election manifesto of 1934 were specifically designed to win back the alliance of the capitalists (Markovits 2002, p. 98-100).

Even though business support was not the main reason for the INC's success – which lied in its capacity to mobilise the rural masses – it did play an important role, mainly but not exclusively by providing financial contributions. Already during the non-cooperation movement of 1920-2, businessmen made very large contributions (Krishna 1966, p. 426). Business support – in the form of financial help and participation in the boycott of foreign cloth – was an important factor in the initial success of the first Civil Disobedience movement, just as the weakening of such support helped convince Gandhi to call the movement off in 1931. In the elections of 1937, businessmen provided campaign contributions as well as votes in the special constituencies reserved for them. Systematic data on campaign contributions does not appear to exist, but voting patterns in the constituencies reserved for businessmen in 1937 are telling: of 21 seats, 12 went to either INC candidates or businessmen known to be pro-INC, while only 7 went to businessmen known to be anti-INC (Markovits 2002, p. 120-2). In 1939, the businessmen provided considerable political support to the INC by backing its rejection of a trade treaty with Britain (Markovits 2002, pp. 72-8, 119-24, 128-36 and 179-89). Key to the link between the INC and businessmen was Gandhi himself, a member of the Gujarati elite and friend of important businessmen such as G. D. Birla.

3 Empirical Approach

This section introduces our empirical approach. We present our main specifications in Section 3.1, and discuss threats to identifications in Section 3.2.

3.1 Specifications

Our main independent variable is a district level measure of exposure to 1913-17 changes in Indian net exports to Britain (in short, the "WWI trade shock"). We construct it as follows:

$$\text{EX-IM Shock}_n = \sum_{i=1}^{I} \frac{L_{n,i,11}}{L_{n,11}} \frac{\Delta(EX-IM)^{UK}_{i,17-13}}{L_{i,11}}. \tag{1}$$

The term $\Delta(EX-IM)^{UK}_{17-13,i}$ is the change in net exports to Britain in industry i between 1913 and 1917 (in 1911£), which we adjust by initial national employment in industry i, $L_{i,11}$

(we use 1911 as it is the year of the last pre-war census).[25] From this industry level measure of exposure to the WWI trade shock, we construct a district level measure by weighing industries by their initial district employment ($L_{n,i,11}$) as a share of district population ($L_{n,11}$).

Our first set of regressions investigate the link between the WWI trade shock and industrial employment growth. Our baseline specification is

$$\Delta Industry_n = \beta_1 \text{EX-IM Shock}_n + X'_{n,11}\beta_2 + \varepsilon_n, \tag{2}$$

where the dependent variable, $\Delta Industry_n = \sum_i \left(\frac{L_{n,i,21}}{L_{n,21}} - \frac{L_{n,i,11}}{L_{n,11}} \right)$, is the change in the share of industrial employment to total population in district n between 1911 and 1921. As the model is specified in first differences, it is closely related to a fixed effects regression (see Autor et al. 2013) in which however the WWI trade shock only covers part of the differenced period. Accordingly, $X'_{n,11}$ is a vector of district level controls accounting for differential trends between districts based on observables in 1911.

We complement the baseline in (2) with a large number of alternative specifications, to be described in due course. For example, we decompose EX-IM Shock$_n$ into various subcomponents, such as exports versus imports, or primary products versus manufactures. We decompose the dependent variable into five categories of employment by skills and nationality. We run a regression similar to (2), but at the industry level. We redefine the dependent variable to range between 1913 and all of the following years: 1915, 1917, 1919, 1921, 1926, 1936, 1951 and 2011 (the choice of a different start here is driven by data limitations).

Our second set of regressions investigates the impact of industrialisation levels on support for the anti-colonial movement, using the WWI trade shock as an instrument for industrialisation levels. Our second stage takes the form

$$Anticolonial_{n,j,t} = \beta_1 Industry_{n,t} + X'_{n,11}\beta_2 + X'_{j,t}\beta_3 + \varepsilon_{n,j}, \tag{3}$$

where j represents the political unit of observation, and t the year. The variable $Anticolonial_{n,j,t}$ measures support for the anti-colonial movement in unit j and district n in year t. The variable Industry$_{n,t}$ is the industrial employment share in district n just before the political event.

We define $Anticolonial_{n,j,t}$ in two ways, the first of which measures the average strength of anti-imperial feelings by members of the Indian National Congress (INC) in district n in 1922. In this case, the political unit of observation is the district ($j = n$), and $Industry_{n,1921}$ is the

[25] We measure trade in real terms because the shock was mainly on the import side, and was driven by a drop in British supply and by a rise in trade costs. This led to a simultaneous fall in volumes and rise in prices of Indian imports (which is visible from the fact that nominal imports fell less and rebounded more than real imports, see Figure I and Online Appendix Figure A.1). While both of these factors may have stimulated Indian industry, to measure imports in nominal terms would underestimate both, since they drive nominal imports in opposite directions.

industrial employment share in district n in 1921. In addition to our baseline controls ($X'_{n,11}$), we additionally include indicator variables for the 19 INC Provincial Committees, the average seniority of INC members within a district, and the proportion of them who belonged to the Khilafat movement ($X'_{j,22}$).

The second definition of $Anticolonial_{n,j,t}$ measures the share of seats won by the INC (and other political parties) in constituency j in district n in 1937 (constituencies are sub-divisions of districts in the vast majority of cases). Now, $Industry_{n,1936}$ is the industrial employment share in district n in 1936, and we additionally control for constituency-type dummies ($X'_{j,37}$).

3.2 Threats to identification

The usual concern that the trade shock might not be exogenous, but driven by local demand or supply shocks, appears less serious in our context, since WWI was a truly exogenous shock to trade flows.[26] Three observations corroborate this point. First, Britain's exports to countries other than India also fell substantially during the war (see Figure E.1 available in the Supplemental Materials). Second, Indian imports from countries less affected by the war (such as the USA and Japan) boomed during the war (see Online Appendix Figure A.1). Third, Indian imports from Britain resumed very quickly after the war, both in real and in nominal terms (see Figure I & Online Appendix Figure A.1).[27]

Nevertheless, we include a specification in which we instrument for EX-IM Shock$_n$ using the 1913-17 change in third countries' imports from Britain. This is a widely used strategy (e.g. Autor et al. 2013), based on the assumption that shocks in third countries will be uncorrelated with shocks in the country of interest. We use as third countries Britain's exports to the rest of the World excluding India and individually each of Britain's top-five non-European export destinations other than India in 1911 (Argentina, Australia, China, Japan and the USA) supporting the exogenous interpretation of the WWI trade shock.

One concern that is specific to equation 2 is that WWI may have affected Indian industry through channels other than changes in India's net exports to Britain. To the extent that these other channels were correlated with EX-IM Shock$_n$, we would be erroneously attributing their effects to the WWI trade shock. We identify four such channels, and attempt to alleviate the related concerns in a series of robustness checks. First, the war clearly induced some substitution of imports from Britain with imports from British allies, chiefly the USA and Japan (see Figure A.1). To determine whether our coefficient of interest is downward biased by this substitution,

[26]For example, if the fall in Indian imports from Britain was driven by a rise in Indian productivity, then one would observe a positive EX-IM Shock at the same time as a rise in industrial employment, but it would be a mistake to conclude that the former has caused the latter.

[27]This is emphasised by Chaudhuri (1983): "That this [the fall of imports during the war] was due to disruptions on the supply side and not the lack of demand in India can be surmised from an inspection of the import figures in the immediate post-war years".

we attempt to include a second trade shock, measuring the 1913-17 change in Indian imports from these countries. Second, since India contributed more than a million soldiers to WWI and became the supply centre for all Allied operations east of Suez, the related increase in public expenditure may have stimulated local industry. While district level expenditure on soldiers should be proxied by soldier presence in 1911 (a control included in the baseline), we further attempt to control for the effects of war-related expenditure by excluding war-related industries. Third, war casualties may have mattered, and we control for them directly. Finally, WWI gave way to the influenza pandemic of 1917-18, which hit India like no other country. We control for any related population loss by including district level population growth in 1911-21.

One concern that is specific to equation (3) is that our instrument for industrialisation levels (the WWI trade shock) might be correlated with pre-existing, deep-seated anti-imperial feelings. This concern arise from the fact that, unlike equation (2), equation (3) is specified in levels after the war, as opposed to differences before and after. This is done out of necessity, since the 20th century's incarnation of the anti-colonial movement only really started after WWI. To alleviate these concerns, we adopt a two-pronged strategy. First, the $X'_{n,11}$ and $X'_{j,t}$ vectors include possible determinants of pre-WWI anti-imperial feelings, such as province fixed effects (to control for different styles in government across British local administrations) and pre-WWI economic and social characteristics. Second, we conduct a falsification exercise in which we replace the dependent variable with a measure of district participation to the Indian Mutinies of 1857. The Mutinies were the most important act of rebellion against British rule before WWI (Krishna 1966, p.413). While not perfect, such an exercise should at least dispel the worry that there existed long-term factors causing both pre-existing anti-imperial feelings and exposure to the WWI trade shock.

4 Data and Descriptive Statistics

The analysis is based on three main blocks of data – trade data, industry data, and political data – which are briefly described in this section. A detailed description of the data is available in the Supplemental Material E, which also provides summary statistics (Table E.2).

4.1 Trade data

Our first block of data is a hand-collected dataset on product-level net exports from India to Britain (in nominal and real term), yearly in 1911-24. Our main source is the annual Statement of Trade of the United Kingdom (see Customs and Excise Department 1911-1924). This source provides data on British trade by product and country, at up to four levels of product disaggregation. We identified 372 product categories that were traded between India and Britain (37 Indian export categories and 335 Indian import categories), and which could be best matched

to Indian industrial sectors (on which more below).[28] We collected this data in values, and in quantities when available. We then used the available unit values to construct price deflators, allowing us to calculate real trade flows in 1911-24.

We complement this dataset with two similar datasets, one on British exports to the world and its top-five non-European destinations other than India in 1911 (Argentina, Australia, China, Japan and the US), and one on Indian imports from Japan and the USA (the latter comes from an Indian source, the "Annual Statement of the Sea-Borne Trade of British India with The British Empire and Foreign Countries", see Department of Statistics 1911-1921). These datasets span the same product categories collected for India-Britain trade, respectively for the years 1911-24 and 1911-21. We will use the first to construct an instrument for the drop in Indian imports from Britain, and the second to assess whether India compensated for such a drop by importing more from Japan and the US.

Figures I describe the main patterns of real trade between India and Britain in 1911-24, as emerging from our data. Throughout the period, India imported mainly manufactures and exported mainly primary products (the classification of products comes from the Statement of Trade). Between 1913 and 1918, Indian real imports from Britain declined by a factor of 3, from £60 million to £18 million. By 1920, however, they had substantially recovered. In contrast, real exports remained rather stable over the period. All top Indian imports from Britain declined in real terms during WWI, while the picture for top exports was more mixed (see Online Appendix Figure A.2). The corresponding nominal trade flows are presented in Online Appendix Figure A.1, which typically declined less or increased more than their real counterparts, reflecting the high levels of inflation between 1914 and 1920 (Phillips 1958). During the whole period Britain remained by far India's most important trade partner for imports as well as exports.

4.2 Industry data

Our second block of data is a hand-collected dataset on industrial employment at the sector-district level in 1911 and 1921. The source of this data are the industrial censuses, which were run in these years alongside the population censuses (see Census Commissioner 1911, 1921). They provide information on employment in establishments with more than 20 employees (10 in 1921), by sector and district, covering the most developed part of the British Raj and more

[28] We did not collect data at a further level of disaggregation than required by the matching procedure. We also did not collect data on manufacturing products apparently not produced in India, and on primary products not corresponding to Indian industrial sectors. The 372 product categories account for a vast majority of India-Britain trade in 1911: 82% of Indian imports and 72% of Indian exports. The difference is also to a sizeable part due to the aggregate data including Burma in British Indian trade flows, while our more detailed data does not include trade with Burma.

than 78% of its population.[29] The data from the industrial censuses has the advantage of focusing on employment in factories predominantly using mechanical power. This provides a more relevant measure of industrialization than manufacturing employment recorded in the population censuses as these numbers rather represent employment in artisanal and cottage production. The industrial censuses cover not only industrial factories, but also mines and plantations. Thus, the 262 sectors for which we have data can be divided into three broad categories: manufactures, raw materials and food. The latter two categories include both industrially processed raw materials and food (for example, ginned cotton and flour) as well as unprocessed food and raw materials produced on an industrial scale in mines and plantation (for example, iron ore, tea and rubber). Agricultural commodities not produced in plantations, such as uncleaned and unmilled wheat, are not included.

The data is further broken down by skills and nationality of employment, and by firm ownership structure. The breakdown of employment includes administrative staff (all employees related to direction, supervision and clerical work), skilled workers and unskilled workers, with the former two categories further subdivided into "Indians" and "Europeans and Anglo-Indians". Since most Europeans living in India will have been British, and Anglo-Indians were defined as British citizens living in India for a long time, for brevity, we rename the second subcategory "British". A non-negligible share of administrative and skilled workers were British in 1911: 14 and 1 per cent respectively (visualized in Supplemental Material Figure E.3). Data on the number of firms by ownership and sector is only provided at the province level. We thus combine this data with data on the number of firms by sector and district to obtain an approximation of the number of firms by ownership, sector and district.[30] The ownership breakdown includes public versus private, with the latter category further subdivided into privately owned by Indians, privately owned by British, and companies. There was a large number of British-owned firms in India before WWI: Britons owned 23% of privately owned firms, and seemed to own a majority of companies (visualized in Supplemental Materials Figure E.4).

Although the industrial censuses provide us with the data we need to construct our measure of exposure to the WWI trade shock (which is based on 1911 industrial employment) it presents two important limitations when it comes to the construction of our dependent variable (the

[29]We collected data from the industrial censuses for the seven major provinces of British India: Bengal, Bihar & Orissa, Bombay, Central Provinces & Berar, Madras, Punjab, and the United Provinces. These censuses provide data for the British-ruled districts of these provinces, as well as for 44 princely states which were included in them. Our sample does not cover a set of princely states, as well as the smaller provinces of Ajmer-Merwara, Adanamans and Nicobar, Assam, Baluchistan, Burma, Coorg, and the North-West Frontier province.

[30]For the province of Bombay, the province-level industrial classification does not match well with the one at the district level. We are thus forced to drop Bombay in regressions that use the breakdown by ownership.

change in the industrial employment share).[31] First, the industrial censuses only allow us to construct the dependent variable for 1911-21. Second, the reduction in the threshold for census inclusion spuriously increases our dependent variable between 1911 and 1921, by counting as an increase the employment at firms that were in the 10-20 bracket in both years. Although this effect does not seem large on aggregate (firms in the 10-20 brackets account for only 2.5% of industrial employment in 1921, visualized in Supplemental Material Figure E.5), we cannot fully rule out that this biases our results.

To circumvent these limitations, we complement the census data with data from the Factory Reports (available yearly in 1897-1948), and from the 1951 and 2011 censuses of independent India. The Factory Reports (Department of Industry 1897-1948), provide data on employment in firms covered by the 1911 Indian Factories Act, which were larger than those included in the industrial censuses, and did not include neither mines nor indigo, tea and coffee plantations.[32] Despite the narrower coverage, the Factory Reports allow us to construct our dependent variable for periods other than 1911-21 (both shorter and longer). Furthermore, because the threshold for inclusion in the Factory Reports was the same in 1911 and 1921, they allow us to verify the robustness of our earlier results.[33] We also collected district level industrial employment from the Censuses of India of 1951 and 2011 (Census Superintendent 1951; Census Registrar General 2011). The data collected matches the industrial sectors covered by the Factory Reports, but all firms are included irrespective of the number of employees. Importantly, artisans are still reported separately.

After matching the 262 census industrial sectors to our 372 trade categories, we are left with 105 matched ("traded") sectors (of which 71 are import competing, 12 are exporting, and 22 are both import competing and exporting) and 45 unmatched ("non traded") sectors. A full list of sectors, classified by trading status and broad category (manufactures, raw materials, and food) is provided in Supplemental Material Table E.3. The 45 non traded sectors are census industrial sectors for which we were unable to find a match with a trade category. In the vast majority of

[31] An additional small concern is that some administrative boundaries changed. To account for this we merge districts that underwent sizeable changes. More detail is provided in visualized in Supplemental Material Section E.2.

[32] Between 1911 and 1922, the reports cover are all establishments which either (a) at any day of the year had at least 50 persons employed and used power driven machinery or (b) any premises with at least 20 employees that was declared a factory by the local government in the official Gazette (Prideaux 1917). These thresholds were decreased to 20 and 10 in 1922, and to 10 and 5 in 1934. A detailed description of the firms covered by the Factory Acts over time is provided in Supplemental Material Section E.3.

[33] The Factory Reports provide a coarser sectoral breakdown compared to the Industrial census, but this is not a problem for the construction of our dependent variable (for which we only need aggregate, district level industrial employment).

cases, this was because they produced non tradable products (e.g. "Waterworks"), or because they produced tradeable products which appeared not to be traded between Britain and India (e.g "Ice factories").

Aggregate industrial employment was 1.34 million in 1911, and increased by 37% to 1.83 million in 1921, i.e. from 0.55% to 0.75% of the population. When we focus exclusively on traded sectors, the greatest increase was for manufacturing, by 51% as compared to 21% for primary products. Employment in non-traded sectors was initially small, and essentially did not change in 1911-21. The composition in industrial employment is visualized in Supplemental Material A.3.

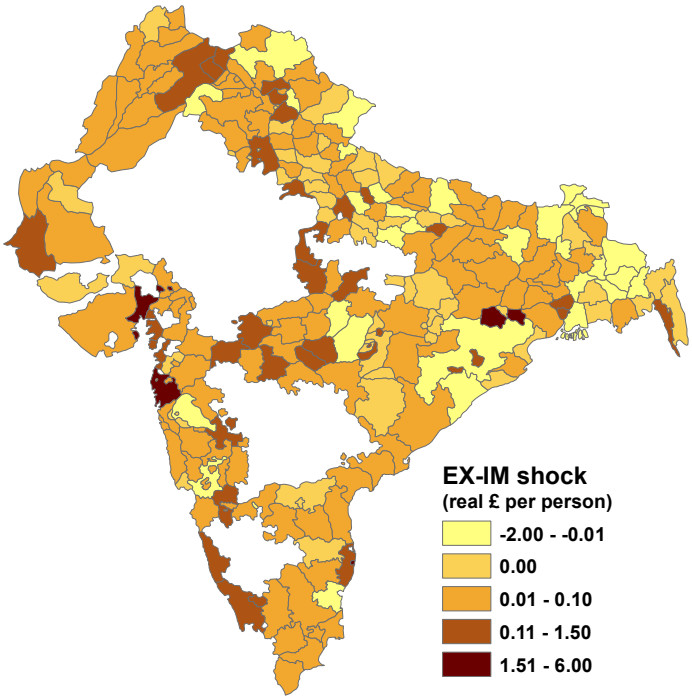
Calculating 1913-17 changes in net exports to Britain in our 105 traded sectors and combining this information with district-industry level employment data from the 1911 census, we can now construct our measure of exposure to the WWI trade shock, as defined in equation 1. Exposure to the trade shock for the average district was £0.11 per person ($\approx$ US$ 16.5 in 2017), or about 2% of annual per capita income (based on a per capita income of US$ 895 in 1913, Bolt et al. 2018). Figure II illustrates the geographical variation of the WWI trade shock across India. While the shock was particularly strong for some notable industrial districts (such as Ahmadabad, Bombay, Calcutta, Madras and Singhbum), there was considerable variation across the country, both along the coast and in the interior.

4.3 Political data

Our final block of data is on support for India's anti-colonial movement, which we use to construct the dependent variable $Anticolonial_{n,j,t}$. The dataset is divided in two parts: the first covers attitudes towards rebellion by members of the Indian National Congress (INC) in 1922, and the second the INC's electoral performance in 1937.

The data on attitudes comes from the Civil Disobedience Enquiry Committee Report of 1922 (Indian National Congress 1922). The report contains answers to the internal survey run by the INC in the summer of 1922, shortly after the failure of the Non-Cooperation Movement. The survey asked local party members how strongly they felt in favour of immediate civil disobedience, and whether or not they favoured particular forms of protests (such as a boycott of British products, British education, etc). The report provides the responses of up to 467 party members from all over India, 257 of which we are able to match to specific districts. For each question asked, we then construct an indicator variable which is one for "in favour" and zero for "against", and construct $Anticolonial_{n,1922}$ as the average response in each district. This procedure leaves us with a maximum of 92 (for the question on immediate civil disobedience) and a minimum of 42 (for the question on boycott of British products) district level observations. Of survey respondents, we also observe whether or not they were prominent members (participated

Figure II
WW1 trade shock across India



Notes: The figure shows exposure to the change in net exports to Britain between 1913 and 1917 across British India. The depicted area covers the districts (British provinces and princely states) included in the censuses of Bengal, Bihar & Orissa, Bombay, the Central Provinces, Madras, Punjab and the United Provinces. The districts included represent 246,277,634 of the 315,156,396 population of British India (78%).

in one of the 19 INC Provincial Committees, or in the All-India Committee)[34] and belonged to the Khilafat movement. Online Appendix Figure A.4 illustrates the geographical variation of $Anticolonial_{n,1922}$, when constructed as the average response to the question on immediate civil disobedience. As shown, our data covers most regions of India and, just like for exposure to the WWI trade shock, displays considerable variation across the country.

The data on electoral performance comes from the "Return showing the results of elections in India 1937" (India Office 1937).[35] We construct $Anticolonial_{n,j,1937}$ as the share of seats won by the INC (and by the other parties who contested the election) in constituency j (in almost all cases, constituencies were sub-division of districts). We cannot construct it as share of votes, since party affiliation and votes received are reported only for successful candidates. The electoral system and how we match Census districts to 1937 constituencies are described in Supplemental Material Section E.4.

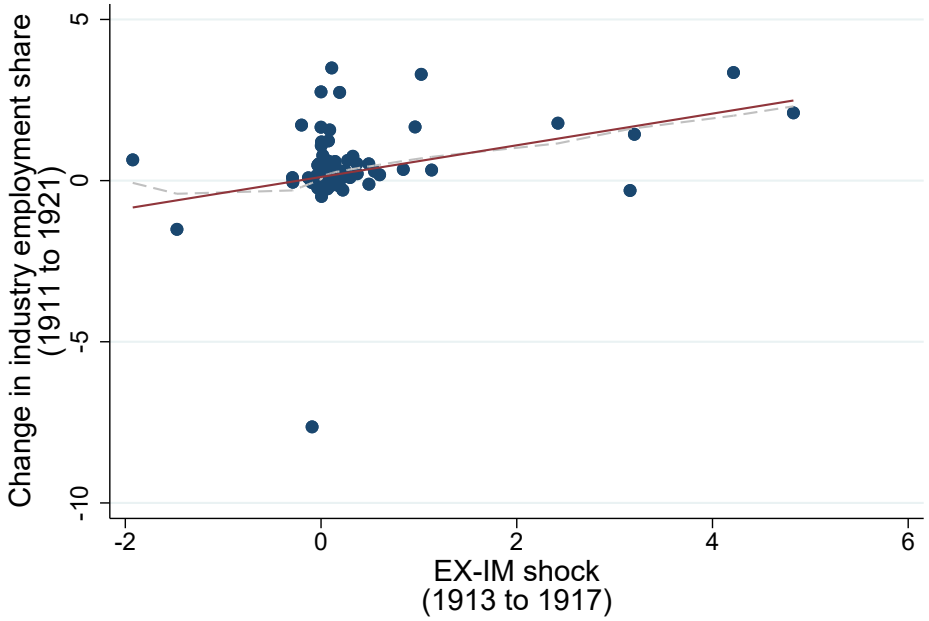
[34]There were more Provincial Committees than Provinces. For example, the Province "Central provinces & Berar" had three: "C.P. Marathi", "C.P. Hindustani", and "Berar".

[35]This data has been used before by Bhavnani & Jha (2018).

5 Results: Industrialization

This section analyses the effect of the World War I trade shock on industrial employment growth across districts in India. Figure III plots a bivariate regression of the 1911-21 change in the industrial employment share on exposure to the WWI trade shock. Districts exposed to a greater 1913-17 increase in net exports to Britain appear to have experienced faster industrial employment growth in 1911-21. We explore the robustness of this result, mechanisms for the increase in industrial employment and the long-run effect in the subsequent sections.

Figure III
Effect of WW1 trade shock on industrialisation



Notes: Change in net British exports per person 1913-17 and industry employment share 1911-21 across Indian districts. The graph is equivalent to the first column from Panel A of Table I. The grey shaded line in the background presents the corresponding locally weighted estimate.

5.1 Baseline

Our baseline results are presented in Table I.[36] Column 1 is the relationship presented in Figure III. It confirms that districts exposed to a greater 1913-17 increase in net exports to Britain,

[36]Standard errors are clustered based on 41 province sub-divisions. Alternative standard errors accounting for spatial correlation with 100km kernal (as in Conley 2008), are presented in square brackets. Corresponding standard errors clustered at the industry level are presented in Online Appendix Table C.2. As shown, our preferred way of clustering on province sub-divisions provides the most conservative standard errors.

Table I
Effect of WWI trade shock on industrialisation

Dependent variable: Change industry employment share 1911-21

	(1)	(2)	(3)	(4)	(5)
EX-IM Shock	0.492***	0.482***	0.486***	0.498***	0.451***
	(0.117)	(0.128)	(0.141)	(0.119)	(0.140)
	[0.092]	[0.113]	[0.116]	[0.106]	[0.130]
Industrial empl. share 1911		0.021	0.008	0.008	-0.002
		(0.071)	(0.072)	(0.081)	(0.084)
Military share 1911				0.065	0.032
				(0.088)	(0.148)
Urban share 1911				-0.001	-0.010
				(0.009)	(0.009)
Coastal				0.008	-0.110
				(0.244)	(0.201)
Literate share 1911					0.066***
					(0.023)
Literate English share 1911					0.015
					(0.130)
Age 20+ share 1911					-0.032
					(0.027)
Province FE	No	No	Yes	Yes	Yes
adj. R^2	0.132	0.132	0.128	0.118	0.142
N (districts)	235	235	235	235	216

Notes: The table presents the effect of the WWI trade shock measured as the change in £1 per person of net exports from Britain faced by a district between 1913 and 1917 on the share of employment in industry. Alternative Conley (2008) standard errors for 100km kernal in square brackets. Robust standard errors in parentheses clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

experienced faster industrial employment growth between 1911 and 1921, and this effect was highly significant. Column 2 adds as a control the initial industrial employment share. This addresses the concern that initially more industrialised districts might have been more exposed to the trade shock, while at the same time being on a faster growth trajectory. However, we do not find evidence of divergence across districts, and the coefficient on the WWI trade shock remains unaffected. Column 3 includes dummies for the seven provinces in our sample, thus absorbing any province-specific trends in the industrial employment share. Column 4 and 5 control for additional district level characteristics: whether they were coastal or not (accounting for any direct effect of the decline in maritime trade during WWI), and their initial population share of

city-dwellers, militaries (a proxy for any rise in government demand for soldiers' equipment),[37] literates in any language and specifically in English, and of people at prime economic age. Only literacy in any language is associated with a faster industrial employment growth between 1911 and 1921. Our coefficient of interests remains very stable and statistically significant: a £1 higher exposure to the trade shock is predicted to increase the industrial employment share by 0.451 percentage points.

Because the WWI trade shock was positive for the average district, the point estimate in our preferred specification (Table 1, column 5) implies that the shock had a positive effect on Indian industry. In particular, the shock accounted for 29 per cent of growth in the industrial employment share between 1911 and 1921. That is to say, while the industrial employment share increased by 0.17 percentage points (from 0.64 per cent to 0.81 per cent), the increase due to the shock was 0.05 percentage points (29 per cent of 0.17). In terms of the dispersion of the effect, being at the 90th percentile of exposure to the shock as opposed to the 10th percentile meant a 0.09 percentage point higher industrial employment share by 1921, that is 14 per cent of the initial average (14 per cent of 0.64).[38] The robustness of this result is evaluated in Online Appendix B (including instrumental variable estimates in Table B.2, placebo exercises in Figure B.1 and industry-level results Table B.4) and Online Appendix C provides a detailed description of the shift-share variable.

5.2 Mechanisms

We now attempt to discriminate between three competing explanations for the persistent effect of WWI on Indian industry (more evidence of persistence is provided in the next subsection). As explained in Section 2, three main hypotheses can be found in the historical literature. First, some of the industries that expanded during WWI simply turned out to be competitive even in normal times. This might be the result of learning what India was good at producing (in the spirit of Hausmann & Rodrik 2003), or of learning-by-doing more generally. For brevity, we call this the "learning" hypothesis. Second, Indian industry benefited from a more proactive industrial policy in the inter-war period (or at least the expectation of it), and this disproportionately benefited industries that did well during the war. We call this the "industrial policy" hypothesis. Third, the WWI trade shock generated large profits for some families, which could later be used to finance industrial expansion. We call this the "credit constraints" hypothesis.

[37]The military share is the number of serving army soldiers present in the district in 1911, divided by the district population. Assuming that districts where soldiers were located before the war were also those where the new recruits were equipped before deployment, and that the related industries were concentrated in these districts, then this measure should control for the direct effect that war had on Indian industry through public expenditure on soldiers' equipment.

[38]The average trade shock was 0.11, so 0.451*0.11=0.05. The difference in exposure at the 90th and 10th percentile was 0.2, so 0.451*0.2=0.09.

Table II
Decomposition of WWI trade shock

Dependent variable: Change industry employment share 1911-21				
	(1)	(2)	(3)	(4)
IM Shock	-0.445*			
	(0.238)			
EX Shock	0.507			
	(1.824)			
IM Raw & Food Shock		7.906		
		(4.718)		
IM Manufactures Shock		-0.481***		-0.467**
		(0.155)		(0.231)
EX Raw & Food Shock			0.505	0.244
			(1.800)	(1.970)
EX Manufactures Shock			7.714*	
			(4.378)	
Controls	Yes	Yes	Yes	Yes
adj. R^2	0.138	0.145	0.118	0.136
N (districts)	216	216	216	216

Notes: The table presents the result for breaking down the effect of the WWI trade shock. Column 1 provides the effect of the trade shock by imports and exports on the change in the share of industry employment. A negative (positive) coefficient on the import (export) shock is going in the same direction as the positive coefficient for the net export shock. Column 2 further separates the import shock into primary (food & raw materials) imports and secondary (manufacturing) imports. Column 3 further separates the export shock into primary (food & raw materials) exports and secondary (manufacturing) exports. Column 4 separates the trade shock into the two main types of colonial trade: primary (food & raw materials) exports and secondary (manufacturing) imports. All columns include the full vector of control variables from column 5 of Table I. Online Appendix Table C.3 confirms the robustness of the differential effect of colonial trade in more detail. Robust standard errors in parentheses are clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We begin in Table II, column 1, by showing that our baseline effect was driven by changes in imports, and not by changes in exports. We now decompose the trade shock defined in equation 1 in two parts: an import shock, only featuring $\Delta IM^{UK}_{i,17-13}$ in the numerator, and an export shock, only featuring $\Delta EX^{UK}_{i,17-13}$. We expect a negative coefficient on the former (indicating that Indian industry benefited from a decrease in imports), and a positive coefficient on the latter (industry also benefited from an increase in exports). Did changes in imports or exports have

a persistent effect on industry? The coefficients on the two shocks have the expected sign and are similar in magnitude, both to each other and to the baseline coefficient.[39] However only the coefficient on the import shock is significantly different from zero.

Given that India imported mostly manufactures and exported mostly primary products, the last result may hide that it was changes in the trade of manufactures that mattered for persistence, and not changes in the trade of primary products. Columns 2-4 investigate this possibility. In columns 2 and 3, we further break down the import and export shocks into shocks to manufacturing industries and to industries processing primary products.[40] When we do so, we find that, indeed, changes in the trade of manufactures had a persistent effect no matter whether they were changes in imports or exports, whereas changes in the trade of primary products did not matter for employment 1911-21. The coefficients on the shocks to imports of primary products and exports of manufactures are very large. This may be spuriously due to the fact that these trade flows accounted for a very small portion of India's trade, and only a few of her industries (Figure I, Supplemental Material Table E.3). For this reason, in column 4, we focus on the two components of the trade shock that best represent India's trade: the shock to imports of manufactures, and to exports of primary products. Results in this column confirm the pattern described earlier.[41]

Because the WWI shock to imports of manufactures was negative for the average district (imports of manufactures fell), the point estimate of its coefficient in column 4 implies that the manufacturing import shock had a positive effect on Indian industry. In particular, it accounted for 40% of growth in the manufacturing employment share between 1911 and 1921 (as compared to 29% in the baseline).[42]

If the WWI shock to exports of primary products did not have a persistent effect on industry, did it at least have a temporary effect? Table III uses Factory Reports data to break down our dependent variable into four sub-periods: 1913-15, 1915-17, 1917-19 and 1919-21.[43] Panels A1 looks at the overall WWI trade shock. Although the shock already had a positive effect on industrial growth in 1913-15, this increased over time to peak in 1917-19, and growth remained

[39]In fact, they are not statistically different from each other when taking the different directions of the shock into account.

[40]For example, the import shock to manufacturing industries is constructed using only $\Delta IM^{UK}_{i,17-13}$ in the numerator, and letting i vary over manufacturing industries only.

[41]That only the change in the import of manufactures had a lasting effect is even more clearly confirmed in Online Appendix Table C.3, which digs even deeper into the separate effects of the two main WWI trade shocks.

[42]The manufacturing employment share increased by 0.14, from 0.26 in 1911 to 0.4 in 1921. Multiplying the average import shock on manufacturing industry (-0.12) by the coefficient (-0.467) we obtain 0.06, which is 40% of 0.14.

[43]Results for 1911-13 have already been discussed in the previous section.

Table III
Short-run effect of WWI trade shock

Dependent variable: Change in industry employment share for specified years

	(1)	(2)	(3)	(4)
Panel A1. Period effect, overall shock				
	1913-15	1915-17	1917-19	1919-21
EX-IM Shock	0.039**	0.066***	0.199***	0.116***
	(0.019)	(0.017)	(0.070)	(0.030)
Panel A2. Accumulated effect, overall shock				
	1913-15	1913-17	1913-19	1913-21
EX-IM Shock	0.039**	0.105***	0.304***	0.420***
	(0.019)	(0.033)	(0.061)	(0.082)
Panel B1. Period effect, breakdown shock				
	1913-15	1915-17	1917-19	1919-21
EX Raw & Food Shock	0.323***	0.119	-0.029	-0.192
	(0.101)	(0.109)	(0.119)	(0.184)
IM Manufactures Shock	-0.008	-0.056***	-0.220***	-0.145***
	(0.016)	(0.016)	(0.068)	(0.024)
Panel B2. Accumulated effect, breakdown shock				
	1913-15	1913-17	1913-19	1913-21
EX Raw & Food Shock	0.323***	0.441**	0.412*	0.220
	(0.101)	(0.170)	(0.243)	(0.383)
IM Manufactures Shock	-0.008	-0.064**	-0.284***	-0.429***
	(0.016)	(0.027)	(0.068)	(0.084)
All specifications:				
Controls	Yes	Yes	Yes	Yes
N (districts)	190	190	190	190

Notes: For all regressions the dependent variable is the change in the share of employment in industry for the respective years. The number of observations is different from the baseline sample for the following reason: we only include districts in the sample that have been at least once reported in the annual Factory Reports. Note that mines and plantations are not included in the Factory Reports and that the threshold of industry was firms with at least 20 employees 1891-1922. Robust standard errors clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

high in 1919-21. The cumulative effect for 1913-21 is very similar to our baseline, which alleviates the concern that the baseline is biased by changes in the census inclusion rule between 1911 and 1921 (see Section 4.2). Panels B1 replicates the earlier panels, but distinguishes the shocks to exports of primary products and imports of manufactures. The former had an effect

in 1913-15, but not after that. In contrast, the shock to imports of manufactures started to have an effect in 1915-17, peaked in 1917-19 and was still very strong in 1919-21. These results are consistent with the historical narrative according to which manufacturing boomed towards the end of the war, when capital and intermediates could be imported again (e.g. Morris 1983). Reassuringly, panels A2 and B2 find cumulative effects for 1913-21 which are very similar to our earlier results, even though the dependent variable is constructed using a different source of data.

Results so far seem most supportive of either the learning hypothesis, or the industrial policy hypothesis. Based on either, you would have expected the shock to imports of manufactures to matter the most. Learning is particularly important in manufacturing, and the inter-war period change in industrial policy was clearly focused on manufacturing. In contrast, if the credit constraints hypothesis was true, then you could have expected the shock to exports of primary products to also have an effect (in the next section, we show that not even in the long run did it have one). Districts exposed to a positive exports shock presumably made much larger profits than those exposed to a negative shock. Indeed, much of the profits made during the war came not from industrial profits, but from speculation on basic commodities (Tomlinson 2013, p.120; Markovits 2002, p.11).

Table IV, panel A, breaks down the change in employment by skills and nationality, finding that the WWI trade shock only boosted the employment of Indian administrative staff (as opposed to British ones). We repeat our baseline specification (Table I, column 5) with the dependent variable now broken down into five categories of employment (British and Indian administrative staff, British and Indian skilled workers, and unskilled workers), so that the sum of the five coefficients equals the baseline coefficient. Unsurprisingly, 74% of the overall effect was due to an increase in the number of unskilled workers. However, WWI also had a significant effect of the number of Indian administrative workers, accounting for 8% of the overall effect. In other words, the WWI trade shock added about one Indian administrative worker per each ten unskilled workers. There was no effect on British administrative workers, or on skilled workers. The latter fact is perhaps not surprising, given that there was a great shortage of skilled workers in India in this period (Morris 1983, p.602).

Panel B provides a similar picture for industrial ownership. Here, we redefine the dependent variable to be the 1911-21 change in the number of industrial firms in a district. We look at the total number of firms, as well as its decomposition into four sub-categories: privately owned by Britons, privately owned by Indians, owned by a company, or owned by the State. The WWI trade shock increased the total number of firms (column 1), through a compositional shift towards Indian privately-owned firms (columns 2-5).[44] This effect was small, though: only 1.2 Indian privately-owned firms are estimated to have been added by the WWI trade shock to the

[44]We looked for but could not find any differential effect of the WWI trade shock on companies, based on the nationality of directors.

Table IV
Industry employment & firm ownership breakdown

Dependent variable: See column header

Panel A. Change industry employment share by groups

	Administrative		Skilled		Unskilled
	British	Indian	British	Indian	Indian
EX-IM Shock	-0.000	0.036***	-0.000	0.084	0.332**
	(0.001)	(0.009)	(0.002)	(0.126)	(0.131)
Controls	Yes	Yes	Yes	Yes	Yes
N (districts)	216	216	216	216	216

Panel B. Change number of firms by ownership

	All firms	Personal		Company	State
	Total	British	Indian	Total	Total
EX-IM Shock	8.380*	-0.162	11.231*	-1.477	0.121
	(4.423)	(0.741)	(5.669)	(1.299)	(0.254)
Controls	Yes	Yes	Yes	Yes	Yes
N (districts)	183	183	183	183	183

Notes: Each column in Panel A presents the result for a subdivision of the industry employment share. Column 1 and 2 provides the result for the change in industry employment that is in administrative roles of British and Indian ethnicity, respectively. Column 3 and 4 provides the result for the change in skilled employment by British and Indian workers. Column 5 provides the result for the change in the share of unskilled employment that is exclusively Indian. Panel B presents the results on the change in the number of firms between 1911 and 1921. Column 1 presents the overall change in number of firms. Column 2 and 3 present the effect on the change in British and Indian privately owned firms, respectively. Column 4 present the result for the change in firms owned by a company with directors. Column 5 presents the result on government owned firms. Data on number of firms is available at the district level, while ownership data is constructed from province-industry cells that are matched to the district-industry structure. More information is given in Supplemental Material E.2. The province of Bombay is excluded in Panel B due to the industry-classifications in the province-industry cells not being reported consistently in 1911 and 1921. Robust standard errors in parentheses clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

average district (multiply average exposure to the trade shock, 0.11, by the coefficient in column 3). It is possible that the shock mostly affected industrial employment at the intensive margin, or that it also created firms in districts where we would not expect to find them based on our empirical strategy.

The latter two results seem supportive of the learning hypothesis over the industrial policy hypothesis. If industries that did well during the war continued to expand because they expected to benefit from a change in industrial policy, then one could have expected this to apply to all firms in those industries, including those managed or owned by Britons. For example, it seems unlikely that the colonial government would discriminate against British managers and entrepreneurs in its public purchase policy, and any change in trade policy would necessarily benefit all firms in affected industries. Instead, the fact that the WWI trade shock only benefited firms run by Indians may indicate that these had more to learn during the war, both in terms of how to produce, and in terms of what they were good at producing.

Table V
Change in workers accidents

Dependent variable: Change accidents per worker

	(1)	(2)	(3)
	1913-17	1917-21	1913-21
EX-IM Shock	2.691**	-1.762***	0.930
	(1.178)	(0.594)	(0.916)
Controls	Yes	Yes	Yes
N (districts)	130	130	130

Notes: The table presents the impact of the trade shock on accidents per 1000 worker from 1913-1921. The vast majority of these accidents appear to be due to mishandling of machinery providing a good proxy for the ability of the workforce to use machinery. Robust standard errors clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Some evidence of learning by doing is provided by Table V, which shows that districts more exposed to the WWI trade shock experienced only a temporary increase in the number of workplace accidents. We now replace our dependent variable with the number of accidents per worker in a district, which is reported by the Factory Reports for 130 districts and three years (1913, 1917 and 1921). Column 1 shows that districts more exposed to the WWI trade shock experienced a greater increase in the number of accidents per worker in 1913-17.[45] This pattern, however, was reversed in 1917-21 (column 2), with the result that Indian industry managed to expand in 1913-21 with no increase in accidents per workers (column 3). Information provided by the Factory Reports suggest that most recorded accidents were due to the incorrect handling of machines, and that workers do not seem to have worked longer hours during WWI.[46] A

[45]The point estimate implies that a district with average exposure experienced an increase of 0.3 accidents per 1,000 workers.

[46]The Bombay Factory Report of 1917 refers to the recorded accidents (28 fatal, 75 serious, 819 minor) in the following way: "The fatal accidents amounted to 27 and caused the death

plausible interpretation of these results is that it took time for new unskilled workers to learn how to operate the machines safely.[47] The acquisition of such skills has been found to be a key aspect of human capital accumulation in the early industrial revolution (see De Pleijt et al. 2020 and references therein).

In summary, the evidence seems most supportive of the "learning" explanation for the persistent effect of the WWI trade shock. As one would expect if learning was important, the effect of the trade shock was mainly due to lagged response of manufacturing, it involved mainly Indian managers and entrepreneurs, and it resulted in only a temporary increase in accidents per workers. "Learning what you are good at producing", or "learning by doing", may both have played an important role. Of course, this is only a tentative conclusion given the limited evidence available.

5.3 Long-run

This section investigates the long-run persistence of the WWI trade shock, finding that it lasted throughout the 20th century and to the present day (2011, the date of the last census). To take such a long-term view, we now construct our dependent variable (the change in the industrial employment share at the district level) using two different sources: the Factory Reports, which provide yearly data between 1897 and 1948 for a subset of larger firms, and the censuses of post-independence India (we only focus on the Republic of India, and not on Pakistan and Bangladesh). All right-hand side variables are the same as in the baseline.

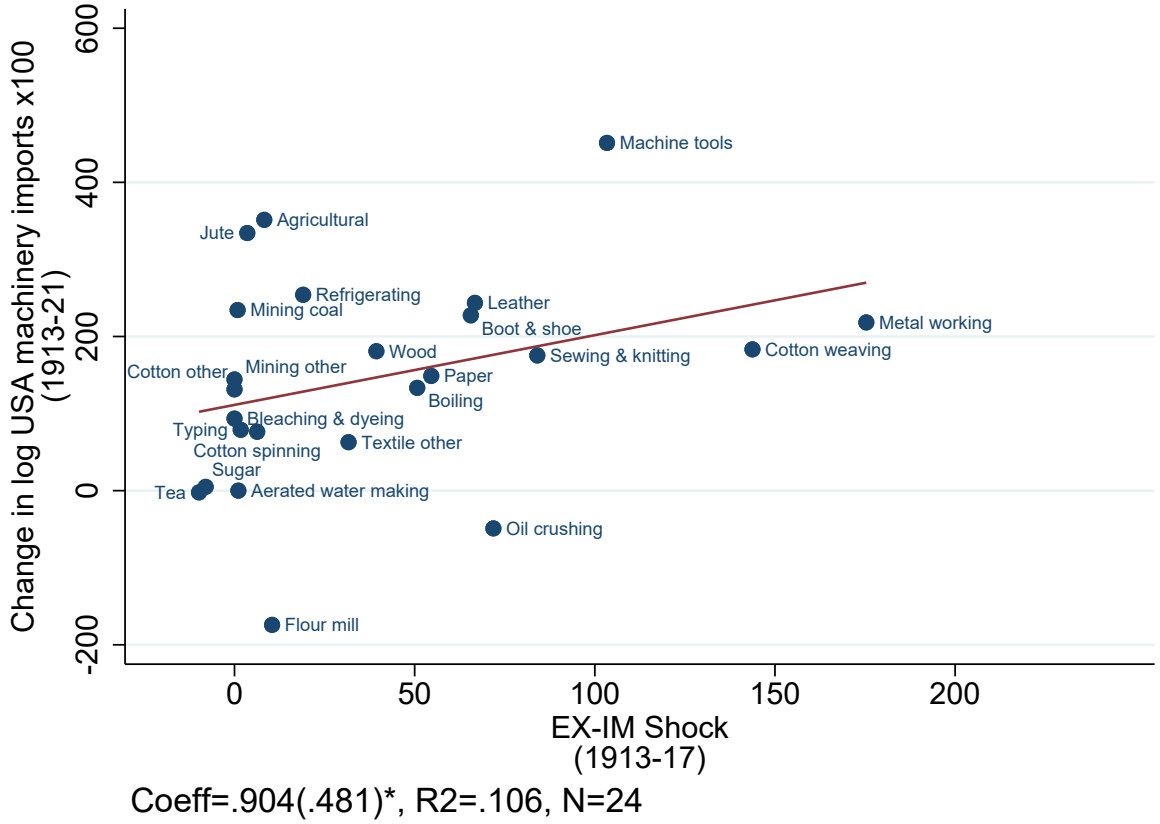
Some preliminary evidence of long-run implications is provided in Figure IV, which suggests that industries more exposed to the WWI trade shock were expanding their productive capacity more by 1921. The figure exploits the fact that, in Department of Statistics (1911-1921), imports of machinery from the USA are broken down by the type of work that the machinery performed (e.g. "metal working", "cotton spinning", etc). We thus plot the 1913-21 change in imports of machinery from the USA by type, against the average WWI trade shock across sectors using that particular type of machinery. The relationship between the two variables is

---

of 28 persons. Of the fatal accidents, 9 were due to machinery and the remainder were due to other causes, chiefly through gross carelessness on the part of the operatives. All accidents unconnected with the machinery and of very trivial nature have been excluded from this report. But fatal accidents of all kinds have been included.". The main cause of fatal accidents appears to be workers being caught by the line shaft (for power transmission) of machinery. Notably, information on shifts and working hours suggests most firms had similar hours of work and holiday set at the maximum level allowed, with no substantial change in the rules (or in the exemptions provided) observable over this period.

[47] A complementary explanation is that it took time for new managers to learn how to organise the production safely. However this hypothesis is not supported by data on prosecutions, which remained low throughout this period.

Figure IV
Effect of WW1 trade shock on machinery imports



Notes: Impact of WW1 trade shock 1913-17 on change in log machinery imports from the USA 1913-1921. To account for zero imports in some categories the value of imports is in 1000' GBP plus one. Due to limited information being available in the Indian statements of trade the data is collapsed at the level of the different types of machinery imported. The corresponding EX-IM shock is calculated by taking the weighted average across all matched categories from the baseline regression. For example, the categories "Cotton fabric" and "Cotton carpet" are matched to "Cotton weaving machinery" imports with the individual EX-IM shocks weighted by each categories share of employment in total employment of the two categories.

positive and significant. For example, some of the largest increase in imports are recorded for machinery used for "metal working" and "cotton weaving", two manufacturing activities exposed to a large drop in imports during WWI. In contrast, imports of machinery used in "tea" and "sugar" production (two sectors that were exposed to a drop in exports) stagnated over this period. Presumably, this indicates that industries which expanded during the war expected to retain their expanded position even after the war was over.

Our main long-run results are presented in columns 2-5 of Table VI (column 1 replicates the 1913-21 regression presented earlier). Our selection of years for the post-1921 period (1926, 1936, 1951 and 2011) is driven by the following considerations. The first year is far enough from 1921, but before protective trade policies had a potential effect in the late 1920s. The

Table VI
Long-run effect of WWI trade shock

Dependent variable: Change in industry employment share for specified years

Panel A1. Period effect, overall shock

	(1)	(2)	(3)	(4)	(5)
	1913-21	1921-26	1926-36	1936-51	1951-2011
EX-IM Shock	0.420***	0.002	-0.039	0.003	1.099**
	(0.082)	(0.021)	(0.086)	(0.171)	(0.434)

Panel A2. Accumulated effect, overall shock

		1913-26	1913-36	1913-51	1913-2011
EX-IM Shock		0.422***	0.383***	0.575*	1.674***
		(0.081)	(0.063)	(0.296)	(0.454)

Panel B1. Period effect, breakdown shock

	1913-21	1921-26	1926-36	1936-51	1951-2011
EX Raw & Food Shock	0.220	-0.329	0.180	0.173	2.894*
	(0.383)	(0.196)	(0.318)	(0.487)	(1.596)
IM Manufactures Shock	-0.429***	-0.026	0.046	0.198	-0.548
	(0.084)	(0.028)	(0.082)	(0.176)	(0.575)

Panel B2. Accumulated effect, breakdown shock

		1913-26	1913-36	1913-51	1913-2011
EX Raw & Food Shock		-0.109	0.071	1.320*	4.041***
		(0.557)	(0.325)	(0.710)	(1.526)
IM Manufactures Shock		-0.455***	-0.409***	-0.380	-1.126**
		(0.079)	(0.062)	(0.233)	(0.510)
All specifications:					
Controls	Yes	Yes	Yes	Yes	Yes
N (districts)	190	190	190	132	132

Notes: The number of observations is different after 1951 as the sample only covers the Republic of India and some districts had to be further merged to create a consistent unit of observation for this time period. More detail on the data is provided in the Supplemental Material E.3. Robust standard errors clustered on province sub-divisions till independence and robust standard errors after independence. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

second year is after the recovery from the Great Depression, and just before the 1937 election which is the subject of analysis in Section 6. Finally, the last two years are those of the first and last censuses of post-independence India.

Columns 2-4 find that districts more exposed to the WWI trade shock remained significantly more industrialised throughout the colonial period, and this long-run effect should be attributed to the WWI shock to imports of manufactures. Districts more affected by the WWI trade shock did not grow either faster or more slowly between 1921 and 1951 (Panel A1). As a consequence, they remained significantly more industrialised throughout this period (Panel A2). Most importantly for our purposes, they remained more industrialised in 1936, the year before the provincial election that projected the Indian National Congress into power. In the next section, we will exploit this exogenous variation to estimate the link between colonial industrialisation and support for an anti-colonial movement. In Panels B1 and B2, we focus on the two key components of the trade shock: the shock to imports of manufactures and to exports of primary products. We find that the above described pattern was driven by the shock to imports of manufactures, though results for the periods ending in 1951 already reflect some of the post-colonial patterns to be discussed next.

Column 5 finds that districts more exposed to the WWI trade shock are still more industrialised to these days. Panel A1 even finds a positive effect of the WWI trade shock on industrial employment growth in 1951-2011. However when we zoom into the key components of the trade shock (Panel B1), we find that it was only the WWI shock to exports of primary products which is significantly associated with industrial employment growth in 1951-2011, and less the WWI shock to imports of manufactures (also a large, but insignificant is observable). This suggests that what we are presumably picking up is a correlation between the disruption to India's export markets during WWI and after independence.[48] Even though the WWI shock to imports of manufactures did not lead to faster industrial growth 1951-2011, it did have a positive, cumulative effect in 1913-2011 (Panel B2). This indicates that districts shifted to a higher industrial employment share due to the disruptions to imports of British manufactures during WWI and continue to retain that higher industrial employment share even a century later.

Even though one must be cautious in attributing these long-run effects to WWI (since many other shocks have occurred since then), our results clearly point at a persistent effect of the WWI trade shock on Indian industry, at the very least throughout the 1920s and 1930s. The Indian

[48]Being part of the British Empire meant that India was well connected with the rest of the world, and that exports of primary products were encouraged. Part of that connectivity must have been lost after independence, and the post-colonial governments were not particularly supportive of India's traditional exports. As a consequence, these performed poorly in the first few decades after independence (Vaidyanathan 1983, pp.972-3, Gupta & Roy 2017, p.245). Thus, the same districts that suffered from a disruption in their export of primary products during WWI suffered from a similar fate after 1951.

economy has gone through many shocks and changes since 1921, the most important being the Great Depression (and the resulting rise in protectionism in the 1930s), World War II (which is known to have greatly stimulated Indian industry), independence (which led to the rise of a hyper protectionist state), and liberalisation after 1991. To the extent that some of these shocks were correlated with the WWI trade shock and had a similar effect on industry, our coefficients would be picking up their combined effect. Still, we believe our results until at least 1936 are truly indicative of a persistent effect of WWI. The year 1926 was before any other major shock, and before protective tariffs were introduced (with the exception of iron and steel).[49] The year 1936 came after the Great Depression and the granting of selective protection (mostly increasing imperial preference, not affecting imports from and exports to Britain). However, the Great Depression had a relatively small effect on Indian industry, and the protective tariffs that were granted before 1936 were not significant enough to represent a major change in industrial policy (Markovits 2002, pp.41-2; Tomlinson 2013, p.113).

6 Results: Political Outcomes

We now turn to our second hypothesis, namely that greater industrialisation levels should result in greater support for the anti-colonial movement in a district (equation 3). Section 6.1 measures support using responses to the 1922 internal survey of the INC, while Section 6.2 measures it using the INC's performance at the 1937 election. Section 6.3 shows that there is no corresponding effect on rebelliousness in the Indian mutiny that occurred before WWI.

6.1 Industrialisation levels and 1922 survey responses

In this section, we study the link between industrialisation levels in 1921 (instrumented using the WWI trade shock) and the responses of local INC members to the internal survey run in 1922. The survey asked INC members whether or not they were in favour of different forms of rebellion. For each form of rebellion, we code their answers into a dummy, where 1 indicates in favour and 0 indicates against.

All results are reported in Table VII, which reports five different versions of equation 3, one per each question asked. The dependent variable is defined at the district level and measures the average response of INC members in a district. In addition to our baseline controls, we include the share of members who were part of an INC committee above the district level (province or national level), the share of them who were part of the Khilafat Movement, and indicator variables for the 19 INC Provincial Committees, which in addition to geographic characteristics also accounts for differences in the timing of the interviews. Controlling for a large number of pre-WWI economic and social characteristics, as well as for province and INC committee fixed

[49] Protectionist tariffs introduced in India during the interwar years indeed appear to have boosted imports of UK manufactures rather than reduced them (Arthi et al. 2020).

Table VII
Questions from the 1922 civil disobedience enquiry

Dependent variable: Whether or not in favour of reported action

	(1) For immediate civil disobedience	(2) For boycott British products	(3) For private defense	(4) For boycott British education	(5) For boycott of courts in political cases
Industrial empl. share 1921	0.544***	0.729**	0.136	-0.289	-0.011
	(0.165)	(0.309)	(0.113)	(0.214)	(0.430)
Controls	Yes	Yes	Yes	Yes	Yes
N (districts)	92	42	62	69	63
F-stat (1st stage)	23.88	3.15	4.44	44.77	3.79
First Stage (EX-IM Shock)	0.496***	1.032*	1.090**	0.598***	0.775*
	(0.102)	(0.582)	(0.517)	(0.089)	(0.398)

Notes: Each column presents the result for a different question related to independence asked in the civil disobedience enquiry committee report. Full vector of control variables from Table I plus INC province committee fixed effects and membership position included. Industrial employment share 1921 is estimated with the WWI trade shock in the first stage. Robust standard errors in parentheses are clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

effects, helps us to alleviate concerns that our instrument (the WWI trade shock) might be correlated with pre-existing, deep-seated anti-imperial feelings.

Our main result is that more industrialised districts featured stronger support for immediate civil disobedience, the most general form of protest that INC members were asked about. The positive and significant coefficient in column 1 indicates that a one percentage point higher industrial employment share in 1921 was associated with a 54% stronger support for immediate civil disobedience in 1922. In turn, this implies that the interruption in colonial trade associated with WWI, by leading to higher industrialisation levels, resulted in a greater support for the anti-colonial movement. In particular, the WWI trade shock is estimated to have resulted in a 6.8% support for immediate civil disobedience.[50] Even though the sample of districts is much smaller compared to before (91 observations), the F-stat on the first stage is sufficiently high

[50]Multiply the average shock in this subset of districts (0.250) by the first-stage coefficient (0.496), and then by the the second-stage coefficient (0.544) to obtain a coefficient on the average shock equal to 0.068. Online Appendix Table D.1 highlights that the main result is robust to other potential channels through which WWI might have had an effect on civil disobedience. Here, WWI casualties and deaths in the 1918-19 Spanish flu are of particular interest for the political outcomes, while the other two columns are presented solely for completeness (likely providing bad controls).

for the instrument to be valid. Column 2 finds similar result for a boycott of British goods. Here, however, the sample is very much reduced (down to 41 observations) and the instrument is relatively weak. Columns 3-5 find no evidence that the WWI trade shock influenced views on other types of protest.[51]

6.2 Industrialisation levels and 1937 election results

We now complement results in the previous section by studying the link between industrialisation levels in 1936 (instrumented with the WWI trade shock) and the INC's performance in the 1937 provincial election. We measure electoral performance as the share of seats won by the INC and by the other parties who contested the election.

All results are reported in Table VIII, where we estimate equation 3 using as dependent variable the share of seats won by the INC and by other political forces. The dependent variable is measured at the level of constituencies, which in almost all cases were sub-divisions of districts. In addition to our baseline district-level controls, we now also include constituency-type dummies: Muslim rural, Muslim urban and general (Hindu) urban (where the omitted type is general rural). The INC was the winner of the election (it won 617 out of 1109 seats in our constituencies), and the only party who promised to fight for the independence of all Indians irrespective of caste or creed (Pandey 1978). Following at a distance was the Muslim League, whose platform resembled in some respect that of the INC, but otherwise focused on the interests of Muslims, and the Unionist Party, which mainly represented the interests of Punjabi landlords and was most open to cooperation with the British. A considerable number of "independent candidates" represented a broad spectrum of varied opinions on mainly local issues, while the category "other" covers the remaining smaller parties.

Panel A finds that constituencies in more industrialised districts awarded a significantly higher share of seats to the INC, and a significantly smaller share to the Unionist Party. The panel includes both single-seat constituencies (694 out of 878) and multi-seat constituencies. The coefficient in column 1 implies that a one percentage point higher industrial employment share is associated with the INC winning an additional 4.4% of seats. In turn, this implies that the interruption in colonial trade associated with WWI increased the number of seats won by the INC by 10 out of 617, or 1.5% of the total.[52] This number is likely to underestimate the true effect of industrialisation levels, for two reasons. First, we are including all constituencies, even those where the INC was not an obvious choice (such as Muslim constituencies, or multi-seat constituencies with additional seats reserved for minorities). Second, our dependent

[51]The much reduced sample in columns 2-5 are due to many respondents not explicitly answering all questions.

[52]We obtain the number 10 by multiplying the average trade shock in a constituency (0.155) by the first-stage coefficient (1.281), then by the second-stage coefficient (0.044), and finally by the total number of seats (1109).

Table VIII
Results of 1937 legislative election

Dependent variable: Share of seats won by reported party

Panel A. All constituencies

	(1)	(2)	(3)	(4)	(5)
	Congress	Muslim League	Unionist	Independents	Other
Industry share 1936	0.044**	-0.006	-0.023**	-0.019	0.004
	(0.019)	(0.017)	(0.010)	(0.020)	(0.020)
N (constituencies)	878	878	878	878	878
F-stat (1st stage)	30.58	30.58	30.58	30.58	30.58
First Stage (EX-IM Shock)	1.281***	1.281***	1.281***	1.281***	1.281***
	(0.232)	(0.232)	(0.232)	(0.232)	(0.232)

Panel B. Single-seat Muhammadan constituencies

Industry share 1936	-0.011	-0.061	-0.044	0.109	0.007
	(0.011)	(0.072)	(0.038)	(0.082)	(0.045)
N (constituencies)	367	367	367	367	367

Panel C. Single-seat General constituencies

Industry share 1936	0.060***	0.000	-0.014**	-0.030**	-0.016
	(0.019)	(.)	(0.006)	(0.012)	(0.020)
N (constituencies)	327	327	327	327	327

All specifications:

Controls	Yes	Yes	Yes	Yes	Yes

Notes: Panel A present the results for the share of seats won by different parties across all single- and multi-seat constituencies in the 1937 provincial legislative assembly elections. Only election results for "General" (predominantly Hindu) and "Muhammadan" constituencies are included in the sample. From left to right the columns report the effect on the Congress, Muslim League, Unionist party, Independent, and other parties success to win a seat. Results when distinguishing by multi- and single-seats are nearly identical (not reported). In Panels B and C the sample is focussing exclusively on whether a party won a single-seat constituencies distinguishing by "Muhammadan" and "General" constituencies. Full vector of control variables from Table I plus constituency type fixed effects ("Rural Muhammadan", "General Urban" and "Muhammadan Urban") are included. Industrial employment share 1936 is estimated with the WWI trade shock in the first stage. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

variable measures the share of seats (as opposed to votes) won. This implies that, by construction, the effect will appear to be zero in all non-marginal constituencies, even though higher industrialisation levels may have implied more votes cast for the INC.

Panels B and C focus on single-seat constituencies, and find that industrialisation levels did not benefit the INC in Muslim constituencies but they benefited it especially strongly in general constituencies. The rationale for focusing on single-seat constituencies is that the additional seats of multi-seat constituencies were reserved for minority groups, either officially or unofficially (Indian Delimitation Committee 1936, pp. 13-14). Such groups might vote primarily for candidates representing their specific interests, and not for any of the big national parties. Note that, in single seat constituencies, our dependent variable (the share of seats won by the INC) can only take two values: 0 if the INC lost, and 1 if it won. The coefficient of interest can then be interpreted as the change in probability of an INC victory associated with higher industrialisation levels. Panel B finds that industrialisation levels did not affect the probability of INC victory in Muslim constituencies. This is as expected, since the INC was not a popular choice in Muslim constituencies (it won 10 out of 326), so that very few of them were likely to be marginal for it. The mirror image of this is panel C, which finds that, in single-seat general constituencies, industrialisation levels had a bigger effect on the INC's electoral performance than in the full sample.

Our preferred coefficient (panel C, column 1) implies that a one percentage point higher industrial employment share in 1936 was associated with a 6.0% higher probability of an INC victory in 1937. This implies that the interruption in colonial trade associated with WWI increased the number of seats won by the INC by 8 out of 327, or 2.4% of the total.[53] This is a relatively large effect, particularly given that it entirely relies on variation coming from constituencies turning to the INC, with no weight being given to constituencies merely giving more votes to the INC. Thus, our results suggest that although the INC's success was ultimately explained with its capacity to mobilise the rural masses, this was largely down to low levels of industrialisation in India. Industrialisation levels, per se, did have a large impact on anti imperial feelings.

6.3 Reduced form analysis and placebo

One potential concern is that even after controlling for a large number of pre-WWI economic and social characteristics and for a set of fixed effects, our instrument (the WWI trade shock) might still be correlated with pre-existing, deep-seated anti-imperials feelings.

To alleviate this concern, we conduct in Table IX column 1 a falsification exercise, in which we study the reduced form effect of the WWI trade shock on a measure of district participation in the Indian Mutinies of 1857. The Mutinies were the most important act of rebellion against British rule before WWI (Krishna 1966, p. 413), and are sometimes known as India's "First War of Independence". The dependent variable is the number of cities and towns in a district in

[53] We obtain the number 8 by multiplying the average trade shock in a constituency (0.148) by the first-stage coefficient (2.727), then by the second-stage coefficient (0.060), and finally by the total number of seats (327).

Table IX
WWI trade shock and Indian rebelliousness 1857-1937

Dependent variable: See column header			
	(1)	(2)	(3)
	Mutiny	Support	INC
	participation	civil disobedience	Seats
	1857	1922	1937
EX-IM Shock	-0.026	0.271***	0.056**
	(0.034)	(0.088)	(0.023)
Controls	Yes	Yes	Yes
N	216	92	878

Notes: Column 1 present the effect of the WWI trade shock on the number of towns that rebelled during the 1857 mutiny collected from David (2003). Online Appendix Table D.2 confirms that no effect of the WWI trade shock is observed on the 1857 Indian mutiny across a wide set of different specifications. Column 2 present the direct effect of the WWI trade shock on support for civil disobedience in 1922. Column 3 present the direct effect of the WWI trade shock on seats won by the INC in the 1937 election. Column 2 and 3 present the respective reduced form results to Table VII and Table VIII for comparison. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

which a mutiny took place.[54] For comparability, columns 2-3 report the reduced-form effect of the WWI trade shock on our measures of support for the anti-colonial movement (support for civil disobedience in 1922 and share of seats won by the INC in 1937).

We do not find any significant correlation between the WWI trade shock and participation to the 1857 mutinies, alleviating the concern that there existed some long-term factors causing both pre-existing anti-imperial feelings and exposure to the WWI trade shock. In line with our earlier results, we find a strong reduced-form effect of the WWI trade shock on support for civil disobedience in 1922, and the share of seats won by the INC in 1937.[55]

7 Conclusion

In the *laissez-faire* world of the early 20th century, dependent colonies around the world were open to colonial trade, and this has been blamed for their poor industrial performance. We have found that colonial trade did help to prevent industrialisation in colonial India, as evidenced

[54]Info on cities and town with mutinies is taken from Map 1 in David (2003). Similar results are obtained replacing the dependent variable with a dummy for any city or town in a district having had a mutiny (see Online Appendix Table D.2).

[55]Online Appendix Tables D.3 and D.4 present the coefficient on the controls and show that our results are robust to not including them.

by the fact that its interruption in 1913-17 led to a period of faster industrial growth and to a persistently higher level of industrialisation. The persistence of the effect, and some evidence that this was due to learning, suggests to look at this through a dynamic model of trade, within which free trade can be welfare-decreasing. We also found that colonial trade did help to keep India tied to the British empire, as evidenced by the fact that its interruption in 1913-17 led to stronger support for the anti-colonial movement in the 1920s and 1930s. This is consistent with a classical argument according to which colonial industrialists were a force against empire.

If colonial trade hindered Indian industrialisation, then why did Britain knowingly insist on a policy of free trade? We can think of two explanations. First, promoting Indian industrialisation by restricting trade would have damaged British industry. India took as much as 22% of British manufacturing exports in 1911 (followed at a distance by Germany and the USA, who took 13% and 9% respectively), so British tax revenues and employment must have relied on free access to India's market. Our results suggest an alternative reason: Indian industrialisation would have led to greater support for the Indian anti-colonial movement, thus constraining Britain's capacity to extract resources from India, and increasing the chances of decolonisation. Both explanations are in principle valid to explain the wide range of anti-industrial policies that the European colonisers adopted in colonies in this period (O'Rourke & Williamson 2017, p.7).

Although our results suggest that free trade helped to prevent industrialisation in India, they should not be taken to imply that protectionist policies would have necessarily been better. First, evaluating the full impact of protectionist policies would require a careful comparison between all the different costs and benefits of protection, something that is beyond the scope of this paper. Second, protectionist policies may easily degenerate. For example, the extreme policies introduced after independence clearly backfired, as is extensively shown by the literature on the liberalisations of the 1990s.[56] Politics seems to have played an important role in this degeneration. Some of the industrialists who benefited from the World War I trade shock and later supported the anti-colonial movement were amongst the signatories of the 1940s Bombay Pact, an agreement between business and the INC which laid the foundation of the future hyper-protectionist state (see Gupta & Roy 2017, p.242). In other words, the WWI trade shock contributed to the rise of a lobbying group that was able to secure permanent protection. This is a far cry from the temporary protection advocated by the infant industry argument.

[56] Goldberg et al. (2009), Goldberg et al. (2010), and Topalova & Khandelwal (2011) all show that India's 1991 tariff reduction fostered growth, by making Indian firms more productive and inducing them to produce more products.

References

Acemoglu, D., Autor, D., Dorn, D., Hanson, G. H. & Price, B. (2016), 'Import competition and the great US employment sag of the 2000s', *Journal of Labor Economics* **34**(S1), S141–S198.

Acemoglu, D., Johnson, S. & Robinson, J. A. (2001), 'The colonial origins of comparative development: An empirical investigation', *American Economic Review* **91**(5), 1369–1401.

Adao, R., Kolesár, M. & Morales, E. (2019), 'Shift-share designs: Theory and inference', *The Quarterly Journal of Economics* **134**(4), 1949–2010.

Arthi, V., Lampe, M., Nair, A. R. & O'Rourke, K. H. (2020), The impact of interwar protection: Evidence from india, Technical report, National Bureau of Economic Research.

Autor, D., Dorn, D. & Hanson, G. H. (2013), 'The China syndrome: Local labor market effects of import competition in the US', *American Economic Review* **103**(6), 2121–68.

Autor, D., Dorn, D., Hanson, G. & Majlesi, K. (forthcoming), 'Importing political polarization? The electoral consequences of rising trade exposure', *American Economic Review* .

Bagchi, A. K. (2000), *Private investment in India, 1900-1939*, Vol. 5, Taylor & Francis.

Bardhan, P. (1971), 'On optimum subsidy to a learning industry: An aspect of the theory of infant-industry protection', *International Economic Review* **12**(1), 54–70.

Bhavnani, R. R. & Jha, S. (2018), 'Forging a non-violent mass movement: Economic shocks and organizational innovations in India's struggle for democracy'.

Bolt, J., Inklaar, R., de Jong, H. & Luiten van Zanden, J. (2018), Rebasing 'Maddison': New income comparisons and the shape of long-run economic development, Technical report, Maddison Project Database, version 2018.

Bonfatti, R. (2017), 'The sustainability of empire in a global perspective: The role of international trade patterns', *Journal of International Economics* **108**, 137–156.

Borusyak, K., Hull, P. & Jaravel, X. (2018), Quasi-experimental shift-share research designs, Technical report, National Bureau of Economic Research.

Census Commissioner (1911, 1921), *Census of India*, Calcutta: Superintendent government printing, India.

Census Registrar General (2011), *Census of India*, Directorate of Census Operations.

Census Superintendent (1951), *Census of India*, Government Central Press.

Chandra, S., Kuljanin, G. & Wray, J. (2012), 'Mortality from the influenza pandemic of 1918–1919: The case of India', *Demography* **49**(3), 857–865.

Chaudhuri, K. N. (1983), Foreign trade and balance of payments (1757-1947), *in* D. Kumar & M. Desai, eds, 'The Cambridge Economic History of India', Vol. 2, Cambridge University Press.

Clingingsmith, D. & Williamson, J. G. (2008), 'Deindustrialization in 18th and 19th century India: Mughal decline, climate shocks and British industrial ascent', *Explorations in Economic History* **45**(3), 209–234.

Conley, T. G. (2008), *Spatial Econometrics*, Palgrave Macmillan UK, London, pp. 6159–6165.

Customs and Excise Department (1911-1924), *Annual statement of the trade of the United Kingdom with foreign countries and British possessions*, His Majesty's Stationery Office, London.

David, S. (2003), *The Indian Mutiny: 1857*, Penguin UK.

De Pleijt, A., Nuvolari, A. & Weisdorf, J. (2020), 'Human capital formation during the first industrial revolution: evidence from the use of steam engines', *Journal of the European Economic Association* **18**(2), 829–889.

Dedinger, B. & Girard, P. (2017), 'Exploring trade globalization in the long run: The RICardo project', *Historical Methods: A Journal of Quantitative and Interdisciplinary History* **50**(1), 30–48.
URL: *http://ricardo.medialab.sciences-po.fr*

Dell, M. (2010), 'The persistent effects of Peru's mining mita', *Econometrica* **78**(6), 1863–1903.

Dell, M. & Olken, B. A. (2020), 'The development effects of the extractive colonial economy: The dutch cultivation system in java', *The Review of Economic Studies* **87**(1), 164–203.

Department of Industry (1897-1948), *Annual report on the working of the Indian Factories Act in British India*, Superintendent government printing.

Department of Statistics (1911-1921), *Annual statement of the sea-borne trade of British India with the British Empire and foreign countries*, Govenor-General in Council, India.

Donaldson, D. (2018), 'Railroads of the Raj: Estimating the impact of transportation infrastructure', *American Economic Review* **108**(4-5), 899–934.

Fuchs, S. (2018), 'The spoils of war: Trade shocks during WWI and Spain's regional development', *mimeo* .

Goldberg, P. K., Khandelwal, A. K., Pavcnik, N. & Topalova, P. (2010), 'Imported intermediate inputs and domestic product growth: Evidence from India', *The Quarterly Journal of Economics* **125**(4), 1727–1767.

Goldberg, P., Khandelwal, A., Pavcnik, N. & Topalova, P. (2009), 'Trade liberalization and new imported inputs', *American Economic Review* **99**(2), 494–500.

Goldsmith-Pinkham, P., Sorkin, I. & Swift, H. (2018), Bartik instruments: What, when, why, and how, Technical report, National Bureau of Economic Research.

Gupta, B. & Roy, T. (2017), From artisanal production to machine tools - Industrialization in India over the long run, *in* K. H. O'Rourke & J. G. Williamson, eds, 'The Spread of Modern Industry to the Periphery Since 1871', Oxford University Press.

Hausmann, R. & Rodrik, D. (2003), 'Economic development as self-discovery', *Journal of Development Economics* **72**(2), 603–633.

India Office (1937), *Return showing the results of elections in India 1937*, Her Majesty's Stationery Office.

Indian Delimitation Committee (1936), *Report of the Indian Delimitation Committee*, Manager of Publications.

Indian National Congress (1922), *Civil Disobedience Enquiry Committee Report, 1922*, Tagore.

Jaeger, D. A., Ruist, J. & Stuhler, J. (2018), Shift-share instruments and the impact of immigration, Technical report, National Bureau of Economic Research.

Juhász, R. (2018), 'Temporary protection and technology adoption: Evidence from the Napoleonic blockade', *American Economic Review* **108**(11), 3339–76.

Kapur, K. N. (1949), *The Factories Act 1948 & The Payment of Wages Act*, Premier Publishing Co., Fountain-Dehli.

Kemp, M. C. (1960), 'The Mill-Bastable infant-industry dogma', *Journal of Political Economy* **68**(1), 65–67.

Kohli, A. (2004), *State-directed development: Political power and industrialization in the global periphery*, Cambridge University Press.

Krishna, G. (1966), 'The development of the Indian National Congress as a mass organization, 1918-1923', *The Journal of Asian Studies* **25**(3), 413–430.

Kulke, H. & Rothermund, D. (2016), *A history of India*, Routledge.

Lehmann, S. H. & O'Rourke, K. H. (2011), 'The structure of protection and growth in the late nineteenth century', *Review of Economics and Statistics* **93**(2), 606–616.

Litman, S. (1926), 'The effects of the World War on trade', *The annals of the American Academy of Political and Social Science* **127**(1), 23–29.

Liu, C. (2020), 'The effects of World War I on the Chinese textile industry: Was the world's trouble China's opportunity?', *The Journal of Economic History* pp. 1–40.

Lockwood, D. (2012), *The Indian bourgeoisie: A political history of the Indian capitalist class in the early twentieth century*, Vol. 5, IB Tauris.

Markovits, C. (2002), *Indian business and nationalist politics, 1931-1939: The indigenous capitalist class and the rise of the Congress Party*, Cambridge University Press.

Melitz, M. J. (2005), 'When and how should infant industries be protected?', *Journal of International Economics* **66**(1), 177–196.

Mitchener, K. J. & Weidenmier, M. (2008), 'Trade and empire', *The Economic Journal* **118**(533), 1805–1834.

Moore, R. (1983), 'Jinnah and the Pakistan demand', *Modern Asian Studies* **17**(4), 529–561.

Morris, M. D. (1983), The growth of large-scale industry to 1947, *in* D. Kumar & M. Desai, eds, 'The Cambridge Economic History of India', Vol. 2, Cambridge University Press.

O'Rourke, K. H. & Williamson, J. G. (2017), *The spread of modern industry to the periphery since 1871*, Oxford University Press.

Pandey, D. (1978), 'Congress-Muslim League relations 1937–39: The parting of the ways', *Modern Asian Studies* **12**(4), 629–654.

Phillips, A. W. (1958), 'The relation between unemployment and the rate of change of money wage rates in the United Kingdom, 1861–1957', *economica* **25**(100), 283–299.

Prideaux, W. (1917), *A guide to the Indian Factories Act*, Thacker, Spink & Co.

Rothermund, D. (1992), *India in the Great Depression, 1929-1939*, Vol. 6, Manohar Publications.

Roy, T. (2002), 'Economic history and modern India: redefining the link', *Journal of Economic Perspectives* **16**(3), 109–130.

Sivasubramonian, S. (1997), 'Revised estimates of the national income of India, 1900-1901 to 1946-47', *The Indian Economic & Social History Review* **34**(2), 113–168.

Tena-Junguito, A. (2010), 'Bairoch revisited: Tariff structure and growth in the late nineteenth century', *European Review of Economic History* **14**(1), 111–143.

Tomlinson, B. R. (2013), *The economy of modern India: From 1860 to the twenty-first century*, Vol. 3, Cambridge University Press.

Topalova, P. & Khandelwal, A. (2011), 'Trade liberalization and firm productivity: The case of India', *Review of Economics and Statistics* **93**(3), 995–1009.

Turner, C. (1923), The Indian Factories Act, 1911 as amended by the Indian Factories Amendment Act, 1922, Technical report, Bombay (Presidency). Laws.

Vaidyanathan, A. (1983), The Indian economy since independence (1947-70), *in* D. Kumar & M. Desai, eds, 'The Cambridge Economic History of India', Vol. 2, Cambridge University Press.

Vanden Eynde, O. (2016), 'Military service and human capital accumulation: Evidence from colonial Punjab', *Journal of Human Resources* **51**(4), 1003–1035.

Wolcott, S. (1991), 'British myopia and the collapse of Indian textile demand', *The Journal of Economic History* **51**(2), 367–384.

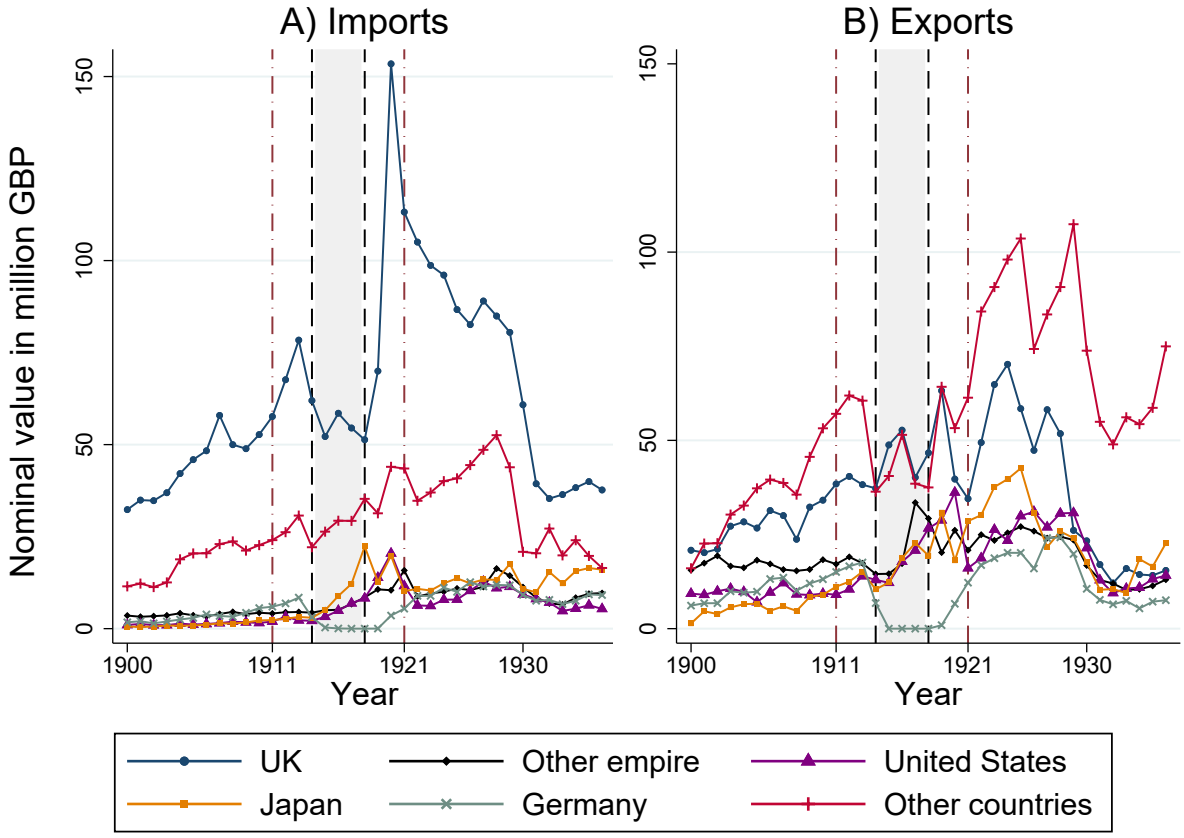
Wolcott, S. (1994), 'The perils of lifetime employment systems: Productivity advance in the Indian and Japanese textile industries, 1920–1938', *The Journal of Economic History* **54**(2), 307–324.

Wolcott, S. & Clark, G. (1999), 'Why nations fail: Managerial decisions and performance in Indian cotton textiles, 1890–1938', *The Journal of Economic History* **59**(2), 397–423.

Online Appendix

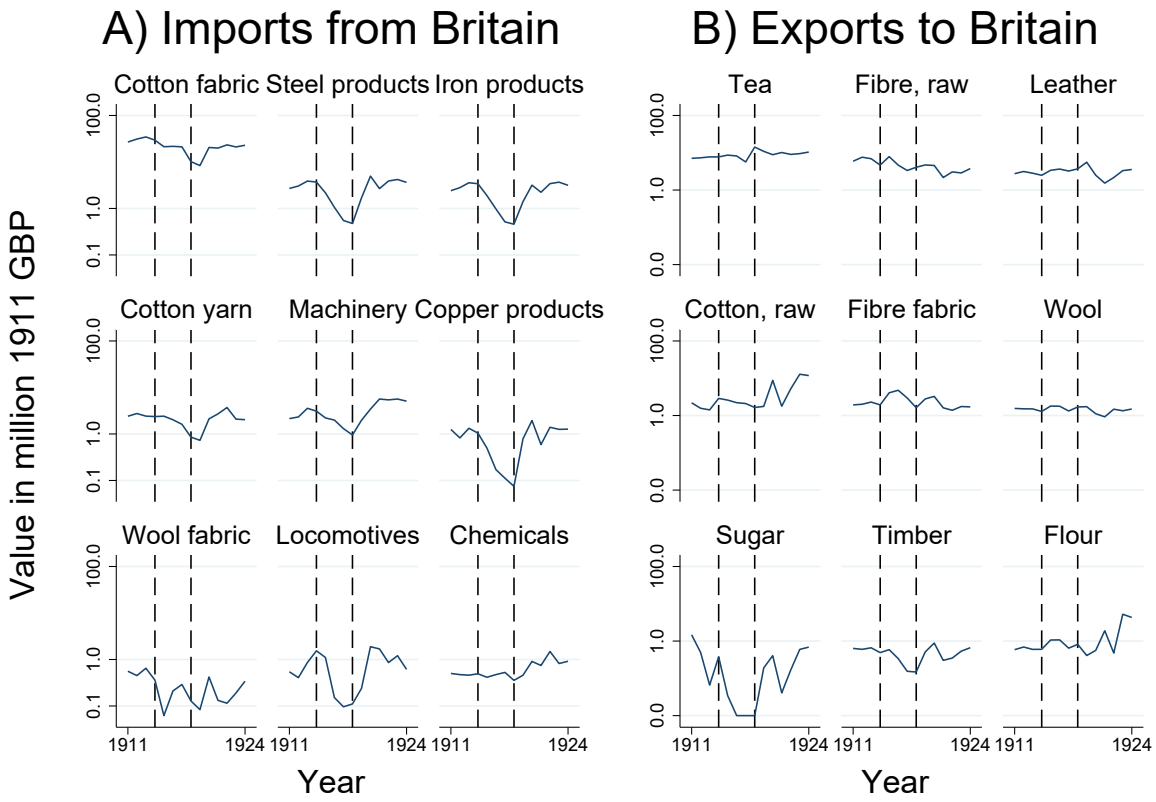
A Descriptive Figures

Figure A.1
Trade between India and main partners in nominal terms



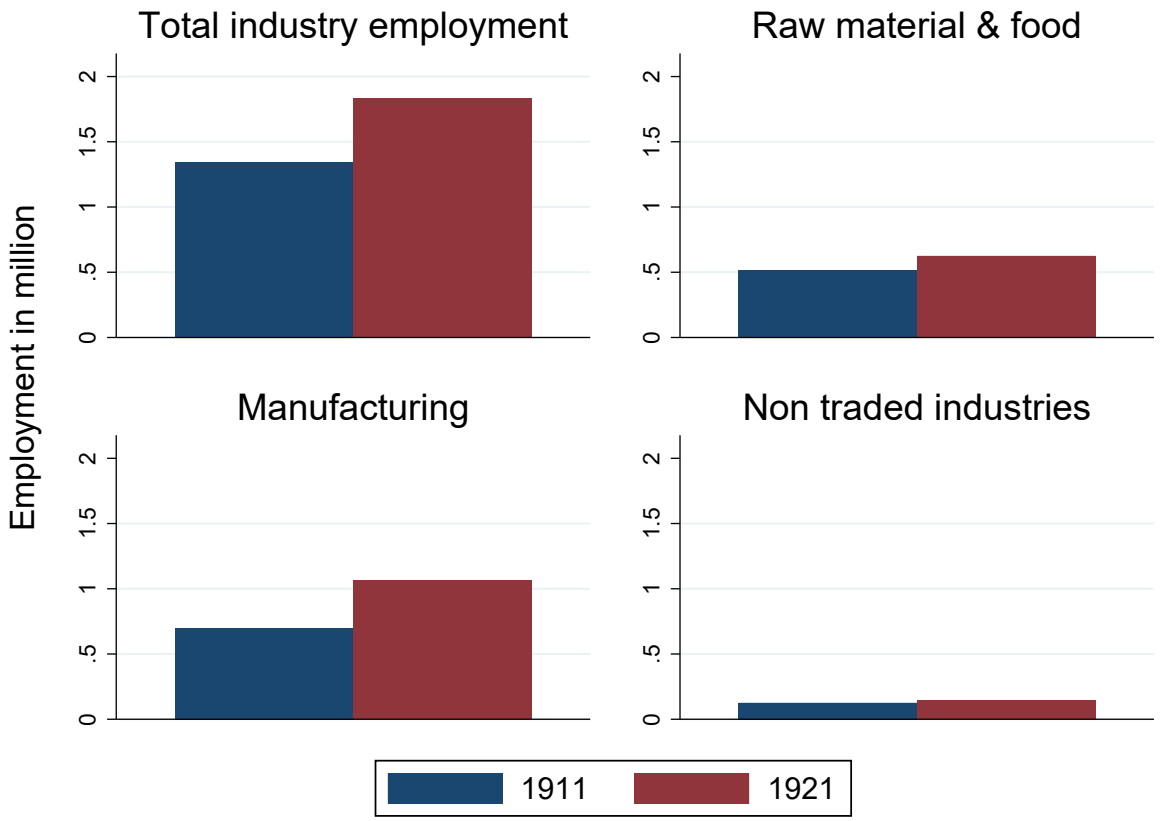
Notes: Total Indian imports and exports from top-4 partners in 1911 (by overall trade volume), in nominal GBP. The grey shaded area highlights World War I, while the red dashed lines for 1911 and 1921 highlight the years of the Indian census. Sources: RICardo Project (Dedinger & Girard 2017). However since this source did not provide Indian imports from Britain in 1929-37, we obtained this data in current Rupees from various yearly editions of the "Review of the trade of India", and converted it into nominal GBP using the exchange rate dataset provided by the RICardo Project.

Figure A.2
Top 9 real imports and exports from Britain



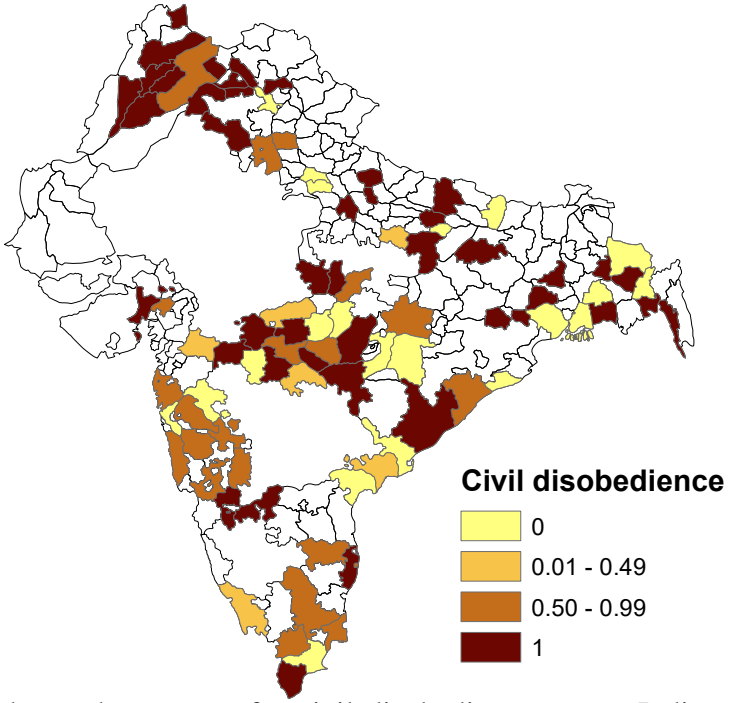
Notes: India-Britain trade in top-9 import and export sectors, in million 1911 GBP (deflator used: price index constructed using the actual prices of imported and exported goods, see Section 4 for details). Industries are ordered in descending value of imports from/exports to Britain in 1911. The term industries refers to the 105 traded industry categories in our dataset that have been merged out of the industry sectors reported in the Census of India and the product categories from the Annual Statement of the Trade of the United Kingdom. Source: Annual Statement of the Trade of the United Kingdom

Figure A.3
Industrial employment across sectors



Notes: The figure displays industrial employment in India for 1911 and 1921 by sector, for our 105 traded sectors as well as for our 34 untraded sectors. The graph on the top-left shows total number of workers employed in firms. The remaining graphs show the employment for three sectors of industries: (i) top-right depicts raw materials & food, (ii) bottom-left depicts manufacturing industries and (iii) bottom-right depicts non-traded industries. Classification of (i)-(iii) based on Annual Statement of the Trade of the United Kingdom. Source: Census of India

Figure A.4
Support civil disobedience across India



Notes: The figure shows the support for civil disobedience across Indian districts in 1922. Responses A-E (pro) are coded as 1 and F-G (against) are coded as 0 across individuals.

B Robustness

Several robustness checks confirm the baseline result that the WWI trade shock had a positive effect on Indian industry, and this was not limited to specific industries or districts. This section reviews them.

As a first step, we have verified that our results are not entirely driven by some of the most notable industries or districts in Table B.1. In terms of industries, we start by key sectors in terms of employment one at a time: cotton raw-to-intermediate products (waste, raw and yarn), cotton final products (fabric and all types of apparel) and other fibres (raw and fabric).[57] Next, to alleviate the concern that the WWI trade shock might be correlated with a war-related rise in public expenditure that benefited Indian industry, we also excluded, iron & steel and military products ("Ammunition", "Arms" and a residual category "Military products" including for example military and naval stores). We also separately excluded machinery, the fifth largest import from Britain after cotton fabric, steel and iron products, and cotton yarn. Finally, we excluded tea and tobacco, two sectors in contrast to others particularly negatively exposed to the WWI trade shock. In terms of districts, we excluded, one set at a time, districts with zero exposure to the trade shock, those with a trade shock above 1.5£ per person (Ahmadabad, Calcutta, Madras, Bombay and Singhbhum) and below -1.5£ per person (Darjeeling), those belonging to princely states that were not directly under British rule, and those which experienced a change in geographical boundaries between 1911 and 1921. In all these cases, the coefficient on the WWI trade shock remained strongly significant, never falling drastically in size and nearly doubling when tea and outlier districts were excluded. This underlines that our observed effect is driven by a wide set of shocks to different industries and districts.

Table B.2 addresses the concern that the 1913-17 trade shock might be endogenous to Indian demand or supply shocks, as opposed to exogenously driven by WWI. It instruments for Indian net exports to Britain using third countries' imports from Britain (we use imports rather than net exports because third countries might export very different products to Britain, compared to India). Thus, a negative sign is to be expected in the first stage. Column 1 uses as an instrument the rest of the world's imports from Britain (excluding India). The first stage suggests that a £1 decline in the rest of the world's imports from Britain is associated with a £0.3 increase in Indian net exports. The second stage is significant, and the coefficient of 0.428 is very close to our baseline estimate of 0.451. Column 2 focuses on the aggregate imports of Britain's top 5 non-European destinations in 1911: Argentina, Australia, China, Japan and the USA (together these accounted for roughly the same proportion of British imports as India, see Figure E.1). The results are essentially unchanged. Columns 3-7 consider these five countries individually.

[57] Significance is lost when excluding cotton finals due to a large increase in the standard error, however the coefficient remains similar to previous estimates. This loss of significance in itself is not robust, since excluding only one severe outlier (Calcutta) makes the coefficient highly significant again.

Table B.1
Robustness of baseline results

Dependent variable: Change industry employment share 1911-21

Panel A. Robustness excluding specific industries

	(1)	(2)	(3)	(4)
	Ex. cotton interm.	Ex. cotton final	Ex. fibre	Ex. iron & steel
EX-IM Shock	0.391**	0.384	0.484***	0.298**
	(0.186)	(0.323)	(0.129)	(0.132)
	(5)	(6)	(7)	(8)
	Ex. military prod.	Ex. machinery	Ex. tea	Ex. tobacco
EX-IM Shock	0.480***	0.436***	0.708**	0.446***
	(0.124)	(0.137)	(0.267)	(0.141)
Controls	Yes	Yes	Yes	Yes
N (districts)	216	216	216	216

Panel B. Robustness of results to excluding specific districts

	(1)	(2)	(3)	(4)
	No Shock	Outliers	Native	Boundaries
EX-IM Shock	0.491***	0.838**	0.520***	0.527***
	(0.154)	(0.335)	(0.123)	(0.124)
Controls	Yes	Yes	Yes	Yes
N (districts)	171	210	190	148

Notes: Panel A presents the results for the exclusion of important industries from the dataset. Column 1-4 (5-8) excludes main industries positively (negatively) affected by the trade shock. Column 1 excludes raw and intermediate cotton products, column 2 excludes cotton fabric and all types of apparel, column 3 excludes fibre (raw & fabric), column 4 excludes iron and steel products, column 5 excludes machinery, Column 6 excludes military products, arms and ammunition, column 7 excludes tea, and column 8 excludes tobacco. Panel B presents the results for the exclusion of specific geographical areas from the data. Column 1 excludes all districts that do not record a trade shock. Column 2 excludes districts with a trade shock that is outside the common range of -1.5£ to 1.5£. Column 3 excludes all princely states included inside the British provinces' censuses. Column 4 excludes all districts which experienced a change in boundaries between 1911 and 1921. All columns include the full vector of control variables from column 5 of Table I. Robust standard errors in parentheses are clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results are very similar when considering countries in the Eastern Hemisphere (Australia, China, Japan), while they lose significance when considering Argentina and the USA. However,

Table B.2
IV strategy - British exports to other countries

Dependent variable: Change industry employment share 1911-21

Instrument:	World	Top 5	East			West	
Export to	(ex. India)	(non-Eu)	Australia	China	Japan	Argentina	USA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EX-IM Shock	0.428*	0.445*	0.467*	0.347***	0.705***	0.455	0.721
	(0.237)	(0.234)	(0.269)	(0.124)	(0.094)	(0.395)	(0.787)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (districts)	216	216	216	216	216	216	216
F-stat (1st stage)	55.22	29.06	11.57	46.42	31.60	4.34	0.12
First stage	-0.280***	-0.501***	-1.033***	-0.778***	-4.155***	-1.253**	0.739
	(0.038)	(0.093)	(0.304)	(0.114)	(0.739)	(0.602)	(2.114)

Notes: Trade shocks instrumented with British exports to the world (excluding India), top 5 non-European destinations, Argentina, Australia, China, Japan, and the USA. All categories of military products are excluded from exports to the world to circumvent the issue of the drastic increase in military supplies provided to European allies during the War. Robust standard errors in parentheses clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

the F-stat for these two countries is very low, suggesting that their imports are weak instruments for Indian imports.[58]

Table B.3 alleviates the concern that the effect of the WWI trade shock was driven by omitted factors, or by the persistence of the shock. Column 1 addresses the hypothesis that the 1913-17 fall in imports from Britain was compensated for by a rise in imports from British allies less affected by the war. It adds to our baseline specification a second trade shock, constructed using the 1913-17 change in Indian imports from the USA and Japan. The coefficient of interest drops only marginally, and the coefficient on the second trade shock is positive but insignificant. This result seems consistent with the historical literature, which has pointed at supply constraints – and not competition from third countries – as the main constraint on industrial growth during the war (e.g. Gupta & Roy 2017, p. 241).

Column 2 further alleviates the concern that the WWI trade shock might somehow be correlated with soldier recruitment or casualties, two other channels through which the war may have affected Indian industry. For example, Vanden Eynde (2016) finds that recruitment led to a significant rise in literacy across the recruitment grounds of Punjab. Additionally, recruit-

[58]We suspect USA imports from Britain followed an exceptional pattern during the war (they were the only ones not to decline, see Figure E.1), possibly due to Britain's need to pay for the vast amount of food and raw materials it imported from this country (Litman 1926).

Table B.3
Other potential explanations for industrialisation

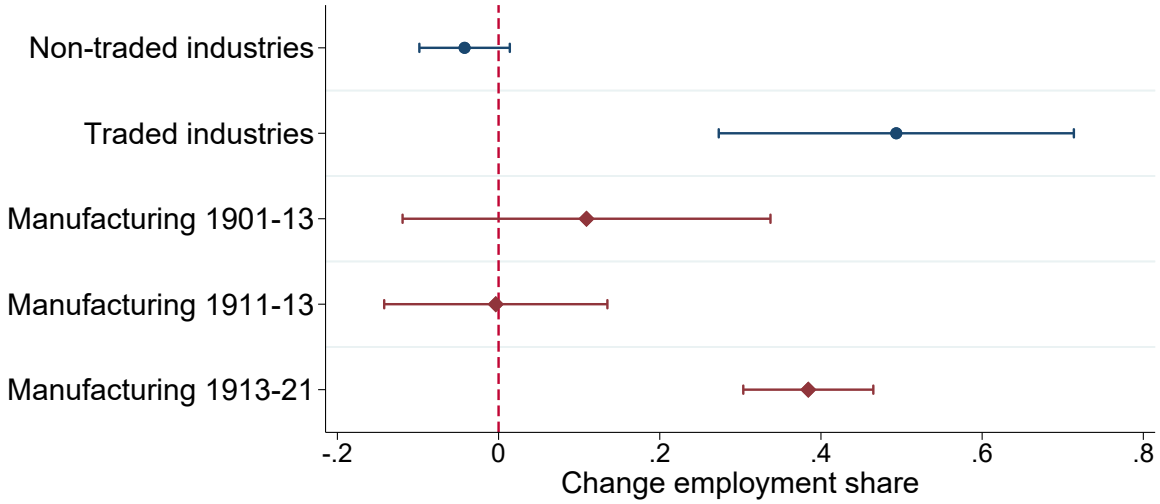
Dependent variable: Change industry employment share 1911-21				
	(1)	(2)	(3)	(4)
EX-IM Shock	0.365**	0.451***	0.421***	0.489***
	(0.146)	(0.141)	(0.147)	(0.115)
Imports Japan & USA	2.433			
	(2.853)			
WWI deaths (in 1000)		0.159		
		(0.456)		
Population growth			2.029	
			(1.528)	
IM Shock (Britain to USA)				-0.738
				(0.473)
Controls	Yes	Yes	Yes	Yes
N (districts)	216	216	216	216

Notes: Column 1 studies the effect of Indian imports from Japan and the USA (1913-17) substituting for British imports during WWI. Column 2 controls for the direct impact of WWI recruitment on industrialization. Column 3 controls for the change in population to account for the Spanish flu. Column 4 studies whether the rise in industrial employment in India can be explained by a persistent change in the structure of British exports (1913-21) not related to industrialization in India. Robust standard errors in parentheses clustered on province subdivisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

ment might be associated with greater wages or local public expenditure, and casualties with greater scarcity of labour. All of these may be correlated with industrial growth. To include a second proxy for both recruitment and casualties (in addition to the already included 1911 military share), we add to our baseline regression the number of casualties reported by each district during the war. Districts that experienced more WWI casualties experienced slightly faster industrial employment growth in 1911-21, however this effect is insignificant. Again, the coefficient on the WWI trade shock is unaffected.

Column 3 alleviates the concern that exposure to the shock might be correlated with deaths in the 1918-19 Spanish flu, another possible determinant of 1911-21 industrial growth. The pandemic hit India most severely than any other country: a recent estimate puts the death toll at up to 14 million people (Chandra et al. 2012). Reliable district level data on flu related deaths is not available (Chandra et al. 2012), so that we proxy for any unusual population loss using the 1911-21 district population growth. The estimated coefficient suggests that this did not matter for industrial growth, and the coefficient on the WWI trade shock is again unaffected.

Figure B.1
Placebo and pre-trend analysis



Notes: The first two coefficients (blue dot) present a placebo check where the first (second) estimate presents the effect of the trade shock on the change in the share of employment in non-traded (traded) industries across districts between 1911 and 1921. The other two coefficients (red diamond) present a pre-trend analysis where the third (fourth) estimate presents the effect of the trade shock on the change in the share of manufacturing employment between 1911-13 (1913-21). The full set of controls is included in all specifications with a 10% confidence interval depicted. The blue coefficients use the baseline sample (n=216). The red coefficients use the Factory Reports data as dependent variable with the number of observations (N=141) being different from the baseline sample for the following reasons: (i) we only include districts in the sample that have been at least once reported in the annual Factory Reports and (ii) district-level employment numbers were not reported in the Bengal Factory Report of 1911 (including Bihar & Orissa before the separation on 22nd of March 1912). For comparability the same sample (N=141) is used for 1913-21. For 1901-13 we were only able to obtain data for Bengal, Bihar & Orissa, Bombay and the Central Provinces (N=90) with initial controls for 1901.

Column 4 corroborates the view that the effect of the trade shock was still visible in 1921 because it was a persistent effect, and not a persistent shock. For example, Wolcott (1991) argues that the post-war boom of the Indian cotton textile industry was sustained by the fact that the British industry took quite a few years to get back on its feet. To control for persistent shocks to British productivity, we add to our baseline a second trade shock, constructed using the 1913-21 change in USA imports from Britain. We use the USA as the importing country, and not the other main British export destinations (India itself, Australia, China, Japan, Argentina) because those other destinations are all known to have benefited from import substitution during the war (Litman 1926, p. 25). These other destinations 1921 imports might therefore be endogenous to a similar local industrial expansion to the one we are trying to explain. While the coefficient on

the additional trade shock is negative, indicating that faster industrialisation in India was indeed positively correlated with persistent British productivity shocks, it is not significant. Moreover, the coefficient on the 1913-17 trade shock is unchanged. These results go some way towards establishing that the WWI trade shock had a persistent effect on Indian industry. We provide more evidence of this in section 5.3.

Table B.4
Effect of WWI trade shock at the industry level

Dependent variable: Change in log industrial employment ($\times 100$)						
	(1)	(2)	(3)	(4)	(5)	(6)
EX-IM Shock	0.167***	0.135***	0.114**	0.122***	0.163***	0.200***
	(0.027)	(0.039)	(0.045)	(0.043)	(0.042)	(0.037)
Log employment 1911		-10.573	-13.567	-9.429	2.801	16.573***
		(8.960)	(9.726)	(9.138)	(7.945)	(4.666)
One-digit industry FE	No	No	Yes	Yes	Yes	Yes
Two-digit industry FE	No	No	No	Yes	Yes	Yes
Only traded industries	No	No	No	No	Yes	Yes
Weighted	No	No	No	No	No	Yes
N (industries)	127	127	127	127	96	96

Notes: This table provides the industry level approach comparable to Acemoglu et al. (2016). For all regressions the dependent variable is the change in log employment at the industry level multiplied by 100. The coefficient for the WWI trade shock presents the effect of a £1 change in net exports per worker on percent employment growth. One-digit industries are the major categories "Raw Materials & Food", "Manufacturing" and "Non Traded Industries" based on the classification in the UK statements of trade. The two-digit industry categories are based on the broadest census classification (15 groups), and the three-digit industry categories are based on more detailed census-classifications subdividing the two-digit classification further (35 groups). Note that due to the different origin of the 1- & 2-digit industry categories the 2-digit industries are not sub-categories of the 1-digit industries. Employment in 1911 is used as weight in Column 6. Robust standard errors in parentheses clustered at the three-digit industry level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure B.1 presents the results of two falsification exercises. In the first, we split our dependent variable (the 1911-21 change in the industrial employment share) into traded and non-traded sectors (such as “Waterworks”). If what we are picking up is the trade effect of WWI, then we would expect this effect to be stronger for traded sectors then for non-traded ones, since the latter might at most be affected indirectly through backward and forward linkages. Results confirm this expectation: while the coefficient on the trade shock is similar in size to the baseline and strongly significant for traded sectors, it is negative and insignificant for non-traded sectors

(the negative sign might indicate labour reallocation from non-traded into traded sectors). In the second falsification exercise, we use Factory Reports data on industrial employment to break our period into three, 1901-1913, 1911-1913 and 1913-1921 (due to data limitations, this is only possible for at most 141 of the 216 districts in our baseline for the period before 1913). If what we are picking up is the trade effect of WWI on Indian industry, then the effect should be present in 1913-21 but not in 1901-1913 and 1911-13. This is indeed what we find, and the coefficient for 1913-21 is also very similar in size to the baseline.

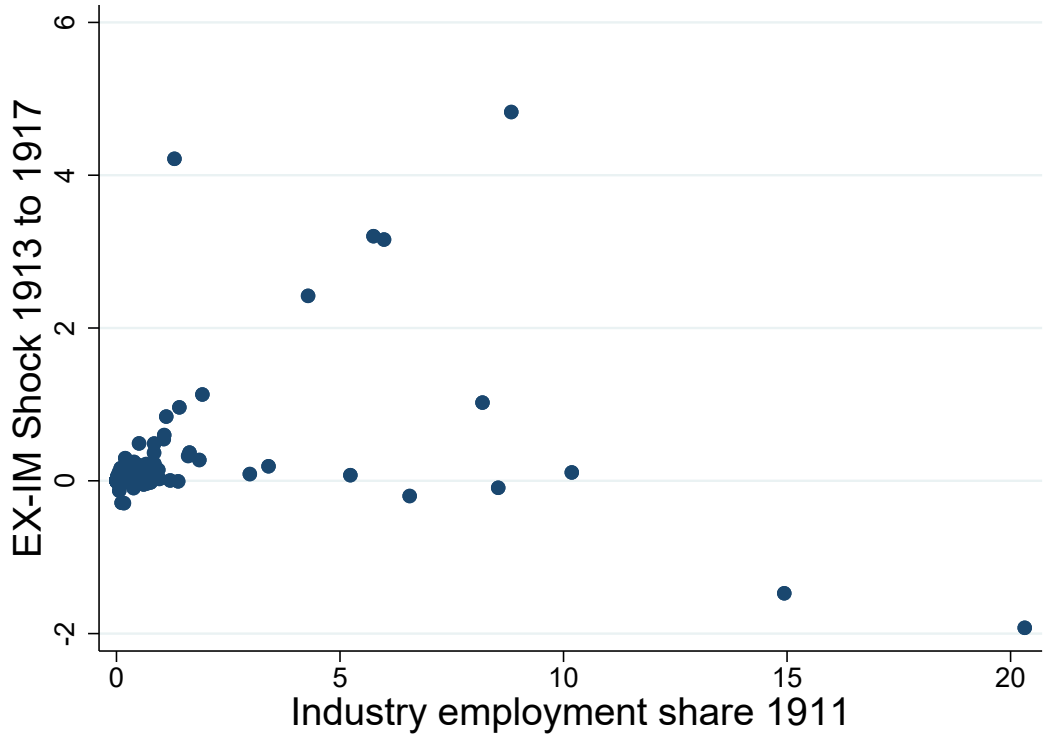
Finally, Table B.4 re-establishes our baseline result using cross-industry variation, as opposed to cross-district one. The dependent variable is now the 1911-21 percentage change in employment in industry i, while the WWI trade shock is the 1913-17 change in net exports to Britain in industry i, per 1911 employee ($\Delta(EX-IM)^{UK}_{i,17-13}/L_{i,11}$). Subsequent columns present increasingly demanding specifications, consistently finding that the WWI trade shock had a positive and strongly significant effect on industrial employment growth. The point estimates in column 6 (where we focus on traded industries, weigh them by initial employment size, and control for initial employment as well as 1- and 2-digit industry fixed effects) indicates that the industry with average exposure grew 26% faster due to WWI.[59] Online Appendix Section C provides more insight into the transition from industry to district level variation, addressing recent concerns regarding the use of shift-share variables (see e.g. Adao et al. 2019 and Borusyak et al. 2018). To the extent that our historical data allows, we do not find major reasons for concerns; rather, it appears that these concerns work against our results.

[59]The average trade shock was £132 per employee, so 132*0.1995=26.

C Additional Shift-Share Checks

This section provides more insight into the nature of the variation our WW1 trade shock exploits. While our data has limitations due to its historic nature we hope to be able to sufficiently address recent concerns raised on the validity of shift-share variables in Adao et al. (2019) and Borusyak et al. (2018).

Figure C.1
Sources of variation in trade shock



Notes: This figure illustrates the relationship between initial industry employment share in 1911 and exposure to the WW1 trade shock across districts .

First we however start by evaluating whether the intensity of the WW1 trade shock across districts is associated with certain district specific characteristics in 1911. Figure C.1 illustrates the correlation between the industrial employment share in 1911 and the 1913-1917 trade shock. We do not observe a clear relationship between the two variables reflecting the considerable variation in the trade shock across industries and the industrial composition strongly varying across districts. We formally analyse this in Table C.1 which shows the relationship between the WW1 trade shock and a set of 1911 variables. In general the table suggests that the trade shock is not correlated with the 1911 manufacturing share, population, military share, police share, share of British employment, share of firms British owned, or share of firms government owned. However, it should be noted that the trade shock is positively correlated with a higher urban share, literate share and age over 20 share across districts. Also, more positively affected districts appear to be more likely to be coastal. Notably, the trade shock appears correlated with

the the coastal location, literacy and age due to its correlation with the urban share. Considering the pattern of colonial trade (raw material & food exports and manufactures imports) and the disruption caused by WW1 it is not necessarily surprising that the trade shock had a more positive effect in urban areas compared to rural ones. This correlation underlines the importance of controlling for the urban share across districts, when evaluating the impact of the trade shock. However, reassuringly the trade shock does not in anyway seem to be associated with the British presence (military nor economic) in India by 1911. This would be particularly worrying as we are unable to observe any political outcomes just before WW1.

Table C.1
Balance check of trade shock

Dependent variable	Coef. (SE)		Coef. (SE)
% Manufacturing 1911	0.477 (1.007)	% Urban 1911	12.45*** (4.474)
Population in millions	-0.021 (0.073)	% Literate 1911	2.823** (1.243)
% Age 20+ 1911	1.387* (0.809)	Coastal	0.111* (0.061)
% Military 1911	0.028 (0.034)	% Police 1911	0.035 (0.039)
% British staff 1911	0.202 (0.122)	% Firms Brit. private 1911	-1.104 (0.817)
% Firms Brit. director 1911	-2.962 (2.593)	% Firms government 1911	-0.025 (0.582)

Notes: This table presents balance checks for the shift-share trade shock as suggested to be performed by Borusyak et al. (2018). It reports the coefficients of regressing exposure to the trade shock on 1911 characteristics across districts. Due to the historic data for these balance tests being unavailable at the industry-level, they are instead conducted at the district level. Robust standard errors clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C.2 presents the evaluation of the shift-share variable as suggested by Borusyak et al. (2018) converting the variables of our shift-share dataset into a dataset of weighted shock-level aggregates. These results are presented at the industry level. Column 1 corresponds to our baseline specification (Column 5 of Table I). The coefficient is slightly different as in our district level dataset some districts do not report any manufacturing employment in 1911 which are not considered in the presented result. Importantly, the standard errors are nearly identical to the ones in the baseline specification (0.140 versus 0.107) when clustering at the 3-digit industry level. This suggests that the concern raised by Adao et al. (2019) on the correlation of regression residuals across areas with similar industries is not an issue going in our favour. We opt for our more conservative clustering at the state sub-division level. Column 2 weights the regression by 1911 industry employment this increases the effect as in the industry-level results presented in Table B.4. However the increase in the coefficient size is even more pronounced. A similar change in the coefficient is observed when using 1911 manufacturing employment as weights in the district level specification. In contrast, when weighting our estimation by district population, results remain similar to the baseline specification. We favour our non weighted estimates for

Table C.2
Sensitivity shift-share coefficient

Dependent variable: Change industry employment share 1911-21

	(1)	(2)	(3)	(4)
EX-IM Shock	0.452***	1.580***	1.601***	1.602***
	(0.107)	(0.234)	(0.262)	(0.261)
Controls	Yes	Yes	Yes	Yes
Weights		✓	✓	✓
Only traded industries			✓	✓
Excluding outlier industries				✓
N (industries)	139	139	105	95
adj. R^2	0.155	0.659	0.661	0.662
N	139	139	105	95

Notes: The table presents the analysis of the effects at the industry-level as suggested in Borusyak et al. (2018). All columns include the full vector of controls from column 5 of Table I. The coefficient in column 1 differs slightly due to some districts not having any industrial employment in 1911 in the baseline specification. In addition to the baseline specification column 2 presents weighted results. Column 3 focusses exclusively on traded industries. Column 4 accounts for outliers being the top-5 industries with the highest and lowest exposure to the trade shock. Robust standard errors in parentheses clustered on three-digit industry level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

three reasons: (i) our focus is on newly emerging industries so it appears counter-intuitive to weight by initial industry size, (ii) not weighting by industry size provides us with a larger and more complete sample of Indian districts and (iii) the unweighted coefficients provide the more conservative estimate. Column 3 presents the effect when only looking at the sample of traded industries and Column 4 when excluding outlier industries (the 5 industries with the highest and lowest per worker exposure). The coefficient remains stable in both cases. The presented results confirm our findings in the baseline specification and suggest that those estimates might reflect a lower bound. It is however worth noting that our data set considerably differs from any of the modern datasets used as examples in Borusyak et al. (2018), so that there might be concerns specific to historical datasets that have not yet been highlighted in the literature.

Table C.3 provides some additional robustness checks for the breakdown along the lines of colonial trade. Column 1 and 2 highlight that the effect of the trade shock 1913-17 on industrial employment change 1911-1921 is driven by the effect of the change in imported manufacturers on employment in manufactures industries. In contrast, there is no spill over effect of the decline in competition in manufactures on industrial employment in raw materials and food. Further, there is no lasting effect of the change in export demand for raw materials and food

Table C.3
Detailed breakdown WW1 trade shock

Dependent variable: Change employment share 1911-21 for specified sector

	(1)	(2)	(3)	(4)
	Manu	Raw & Food	IM Manu	EX Raw & Food
IM Manufactures Shock	-0.529***	0.026	-0.603***	
	(0.110)	(0.185)	(0.173)	
EX Raw & Food Shock	0.209	0.086		-0.133
	(0.479)	(2.125)		(2.345)
Industry share (traded)	0.040	-0.065		
	(0.051)	(0.228)		
Industry share (IM manufactures)			-0.167	
			(0.176)	
Industry share (EX raw & food)				-0.093
				(0.258)
Controls	Yes	Yes	Yes	Yes
N (districts)	216	216	216	216

Notes: The table presents the result for breaking down the effect of the WW1 trade shock along the pattern of colonial trade in additional detail. Column 1 analyses the effect of the two main types of colonial trade, raw material & food exports and manufacturing imports on employment in manufacturing industries 1911-21. Column 2 analyses the effect of raw material & food exports and manufacturing imports on employment in raw material & food industries 1911-21. In both columns we control for the share of industrial employment share in traded industries only. In Column 3 & 4 we are even more specific focusing exclusively on the sectors in question. Column 3 examines the effect of changes in manufacture imports on employment in industries importing manufactures 1911-21. Column 4 examines the effect of changes in raw material & food exports on employment in industries exporting raw material & food 1911-21. In column 3 and 4 we also control for the initial share of the respective industry employment. This means we exclusively exploit within variation in exposure to the trade shock across respective industry categories. Further, to reduce the number of confounding factors we focus exclusively on industries either exporting or importing in Column 3 & 4, but exclude those for which both imports and exports are recorded at the same time. Note, a negative (positive) coefficient on the import (export) shock is going in the same direction as the positive coefficient for the net export shock. Robust standard errors in parentheses are clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

on local industrial employment in manufactures nor raw materials and food. Column 3 and 4 further confirm this pattern looking exclusively at employment change in the respective industries experiencing either a change in import in manufactures (Column 3) or export of raw materials and food (Column 4). In these specifications we also control for the respective 1911 industrial employment share, which means we only exploit the variation in changes to trade between industries within the specific sector, while controlling for any overall trend observed for either imported manufactures industries or raw material and food industries. The observed effects again highlight that the effect is driven by the change in import competition in manufactures, while there is no lasting effect of the change in exports of raw materials and food. Also noteworthy is that across all Column 1-4 we again observe that there is no significant effect of the respective 1911 industry employment shares. This seems to suggest that apart from the variation in trade due to WW1 there is no general pattern of industrialization observable across India between 1911 and 1921.

Table C.4
Randomly allocated trade shock

	Baseline	Traded	Civil dis.
Avg. β	0.000	0.000	0.000
Share $p < 0.05$	0.060	0.099	0.008
Number replications	1000	1000	1000

Notes: This table presents the average result of the key regressions being replicated 1000 times with the trade shock randomly allocated across industries based on the observed mean and variance of the actual WW1 trade shock across industries. In column 1 the trade shock is randomly allocated across all industries and the dependent variable is the change in total industrial employment, while column 2 focusses exclusively on traded industries. Column 3 replicates the civil disobedience specification (reduced form). The reported statistics are the average coefficient obtained and the number of times the null-hypothesis for the EX-IM shock was rejected at the 5%-level. Controls and clustering of standard errors correspond to the respective benchmark specification replicated.

Table C.4 presents the results of a placebo exercise, where we randomly allocate the trade shock across industrial categories. From this we construct a placebo trade shock at the district level and present the average coefficient and the share of rejection at the 5% significance level for 1000 replications. Column 1 presents the result when we replicate our baseline specification (Table I Column 5) with the placebo trade shocks. We see that the average coefficient is 0 and that in 6 out of 100 regressions the coefficient was statistically significant at the 5% level (a minimal over-rejection). Compared to our actual significance level this issue appears rather minor. Column 2 repeats the replication using only the industry categories for which we observe trade flows. We accordingly randomly allocate the trade shock across traded industries and use

the change in the share of manufacturing employment in traded industries as dependent variable. Further, we use the initial share of manufacturing employment in traded industries as a control variable (the other controls remain the same). We observe that in 10 out of 100 regressions the coefficient was statistically significant at the 5% level. This suggests an over-rejection of the null of no effect in the case of only focussing on traded sectors (however note the small number of industries in this case <100). Column 3 does the same exercise for our main political result (Table VII Column 1). We observe that in only 1 out of 100 regressions the coefficient was statistically significant at the 5% level. Suggesting that when looking at political outcomes our specification might actually under-reject. This is reassuring considering the more limited data availability for political outcomes.

The papers of Jaeger et al. (2018) and Goldsmith-Pinkham et al. (2018) highlighting another set of concerns when using a shift-share variable should be mentioned here as well. However, the concerns raised seem unlikely to be an issue in our case. First, we do not expect our WWI trade shock to be related with previous trade shocks due to its war driven nature and neither Britain nor British India having been involved in any major war in previous decades. The uniqueness of the shock is supported by the relatively stable pattern of British import growth observed in Figure A.1. Second, as highlighted in Table B.1 that our coefficient is relatively robust to excluding main industries affected by the WWI trade shock making it unlikely that our result is driven by individual shocks to a specific industry. This is also supported by our industry level results, which are robust to the inclusion of 3-digit industry fixed effects as presented in Table B.4.

D Additional Tables Political Results

Table D.1
Other potential channels support civil disobedience

Dependent variable: Whether or not in favour of civil disobedience				
	(1)	(2)	(3)	(4)
Industrial empl. share 1921	0.308	0.538***	0.543***	0.567***
	(0.542)	(0.167)	(0.161)	(0.173)
Imports Japan & USA	2.203			
	(4.166)			
WWI deaths (in 1000)		0.438		
		(0.456)		
Population growth			0.191	
			(0.808)	
IM Shock (Britain to USA)				-0.453
				(0.310)
Controls	Yes	Yes	Yes	Yes
F-stat (1st stage)	1.59	24.33	23.74	22.49
N (districts)	92	92	92	92

Notes: This table analyses other potential effects of WW1 on support for civil disobedience (analogous to Table B.3). Column 1 studies the effect of Indian imports from Japan and the USA substituting for UK imports during WW1. Column 2 controls for the direct impact of WW1 recruitment on industrialization. Column 3 controls for the change in population to account for the Spanish flu. Column 4 studies whether the rise in industrial employment in India can be explained by a persistent change in the structure of UK exports not related to industrialization in India. Robust standard errors clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D.2
Placebo 1857 mutiny

Dependent variable: Participation in 1857 mutiny				
	(1)	(2)	(3)	(4)
EX-IM Shock	-0.034	-0.026	-0.056	-0.027
	(0.024)	(0.034)	(0.039)	(0.053)
Controls	No	Yes	No	Yes
N (districts)	235	216	235	216

Notes: Columns 1 & 2 present the effect of the trade shock on the number of towns that rebelled during the 1857 mutiny collected from David (2003). Columns 3 & 4 present the marginal effect of the trade shock on a district having at least one town that rebelled. Columns 1 & 2 estimated with OLS and Columns 3 & 4 estimated with Probit. Robust standard errors clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table D.3
Reduced form specification civil disobedience

Dependent variable: Whether or not in favour of civil disobedience					
	(1)	(2)	(3)	(4)	(5)
EX-IM Shock	0.062*	0.159***	0.236***	0.267***	0.271***
	(0.035)	(0.046)	(0.045)	(0.048)	(0.089)
Industrial empl. share 1911			-0.060*	-0.080***	-0.063*
			(0.032)	(0.026)	(0.037)
PCC or AICC member				0.419***	0.517***
				(0.108)	(0.112)
Khilafat member				-0.629**	-0.596**
				(0.279)	(0.292)
Military share 1911					0.003
					(0.078)
Urban share 1911					-0.016**
					(0.006)
Coastal					0.027
					(0.155)
Literate share 1911					0.065
					(0.047)
Literate english share 1911					0.034
					(0.092)
Age 20+ share 1911					-0.044**
					(0.022)
Province FE	No	Yes	Yes	Yes	Yes
INC Province Committee FE	No	Yes	Yes	Yes	Yes
N (district)	92	92	92	92	92

Notes: The table presents the reduced form result for the support of civil disobedience. It also presents the effect of the included control variables. The INC province committee FE in addition to accounting for geographic differences also capture differences in the timing of the interviews. Robust standard errors are clustered on province sub-divisions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table D.4
Reduced form specification 1937 election

Dependent variable: Share of seats won by INC					
	(1)	(2)	(3)	(4)	(5)
EX-IM Shock	0.046*	0.057**	0.059**	0.044**	0.056**
	(0.026)	(0.027)	(0.026)	(0.019)	(0.023)
Industrial empl. share 1911			-0.001	-0.021***	-0.024***
			(0.008)	(0.008)	(0.008)
General-Urban constituency				0.141***	0.138***
				(0.033)	(0.031)
Muhammadan-Rural constituency				-0.731***	-0.727***
				(0.027)	(0.027)
Muhammadan-Urban constituency				-0.783***	-0.799***
				(0.031)	(0.032)
Military share 1911					0.042**
					(0.017)
Urban share 1911					0.003
					(0.002)
Coastal					-0.031
					(0.031)
Literate share 1911					0.019***
					(0.007)
Literate English share 1911					-0.071***
					(0.019)
Age 20+ share 1911					0.003
					(0.004)
Province FE	No	Yes	Yes	Yes	Yes
N (constituencies)	878	878	878	878	878

Notes: The table presents the reduced form result for the share of seats won by the INC in the 1937 province legislative assembly elections. It also presents the effect of the included control variables. The dataset includes all single- and multi-seat constituencies for "General" (predominantly Hindu) and "Muhammadan" constituencies. The constituency type fixed effects are individual dummy variables for the following categories of constituencies: "General Urban", "Rural Muhammadan" and "Muhammadan Urban" with "General Rural" being the reference category. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Supplemental Materials (not intended for publication)

E Supplemental: Detailed Description Data Sources

This section of the Online Appendix provides additional information and summary statistics on the data sources we newly digitized for our analysis. Section E.1 provides additional information on the trade data used obtained from the "Annual Statement of Trade of the United Kingdom" and "Annual Statement of the Sea-Borne Trade of British India with The British Empire and Foreign Countries". Section E.2 provides additional information on employment and ownership data obtained from the 1911 and 1921 British Indian censuses and how the trade data is matched to it. Section E.3 presents more information on the data obtained from the Indian Factory Reports since 1911 and the modern Indian censuses conducted in 1951 and 2011. Section E.4 covers in detail the various data collected for our political outcomes. Section E.5 briefly describes the remaining data sources. Table E.2 at the end of this Appendix presents the summary statistics for all key variables used.

E.1 Supplemental: Trade Data

We collect our main trade data from the "Annual Statement of Trade of the United Kingdom" (see Customs and Excise Department 1911-1924). We focus on the 1914 and 1919 volumes, containing data on British exports and imports by country and product in terms of value and quantity, for the years 1911-1919. The trade categories are organised along a maximum of 4-levels of detail. In addition, we also collected data for 1920-1924 from the "Annual Statement of Trade of the United Kingdom" 1924 volume. From 1920, categories were disaggregated to 6-levels of detail. We aggregate this information back to the 4-level categories. In the following we mostly focus on discussing the 1911-1919 data, which is crucial for our main variables, however we adjust the data 1920-1924 following the descriptions outlined for 1911-1919 when needed.

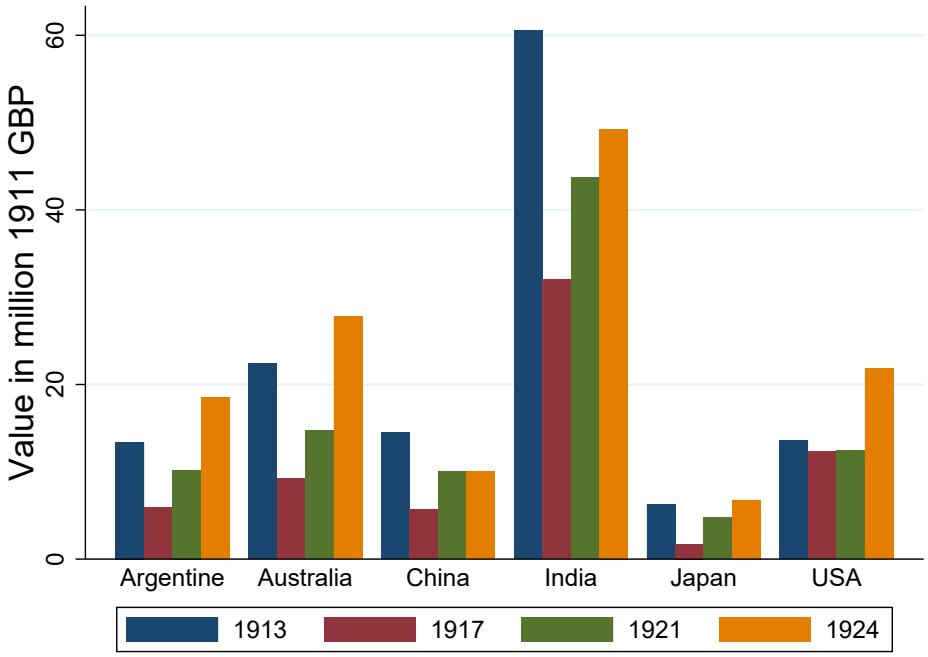
We collect information on 372 trade categories for the years 1910-1919, to be matched to the industrial sectors for which we have census data. Of these trade categories, 335 cover Indian imports from Britain and 37 cover Indian exports to Britain. In 117 smaller British export categories trade is only reported for other British Possessions and not specifically India (comprising a considerable amount of categories, they only account for a fraction of British exports to India). In these cases we adjust the available data by India's share in total British trade with the relevant countries and dependencies. For example the trade category parts of iron and steel bedsteads is reported only for Australia, Canada and other British possessions. Accordingly, we first calculate India's share in total British trade for British possessions excluding Australia and Canada in 1911. Following this we adjust the value of "parts of iron and steel bedsteads" across all years by India's 1911 share in British trade for the specific group of countries in other

British possessions. We do this for all 117 trade categories were trade is only reported for other British Possessions and not specifically India. For British imports the information is presented for British India across all categories of interest, so no adjustment is needed. Similarly, we do this adjustment only for British exports from 1911-19, but not after 1920 due to a further increase in the level of detail reported. We also do a similar adjustment for categories where Burma is not separately reported from the rest of British India.

To construct the trade shock, we need the value of Indian trade with Britain at constant prices (we choose 1911 prices). This requires calculating 1911-1919 prices for the 372 trade categories. Quantity and value data is reported for all Indian export categories, but is not always reported for import categories. This is because Indian imports are mostly manufactured goods which are reported in more detailed categories than Indian exports that mostly consist of raw materials and food. Due to the missing quantity data for Indian imports, we are required to create a price index at the 1st-level of detail (a weighted average of all sub-categories for which quantity and value data is available over the entire period), and use this index to deflate the sub-categories. A simple example here is the trade in hats which is reported at the 1-level of detail as "Hats and Bonnets, Trimmed and Untrimmed" and is only further divided at the 2-level of detail into the subcategories "Felt", "Straw" and "Other Sorts". The first step in constructing a price index for "Hats and Bonnets, Trimmed and Untrimmed" is checking for which of the three 2-level categories data is available for value and quantity over the whole time period. Second, we create a price index by dividing value by quantity in each year for each of those 2-level categories. Third, we create a weight for the importance of the respective price index at the 1-level of detail based on the share of traded value in 1911 of all 2-level categories in "Hats and Bonnets, Trimmed and Untrimmed" were value and quantity data is available. Finally, we sum up all price indexes with regards to the constructed weight at the 1-level of detail and use this aggregate price index to deflate all value data of the 2-level categories. In case we have more levels of detail we follow the same procedure, but use the most detailed level for which we have data. Further, for categories where there is no consistent value and quantity data available for at least one subcategory we use instead the average price index across all products. This applies to the following categories: "Apparel", "Carriages", "Glass", "Instruments and Apparatus, Scientific (other than Electrical)", "Jewellery", "Perfumery and Articles used in the Manufacture thereof (except Spirits, Perfumed in Bond, and Essential Oils)", "Poultry and Game", "Saddlery and Harness", "Spirits, Foreign, Mathylated in the United Kingdom", "Umbrellas". For Indian export categories we adjust for each category's specific price as quantity and value data are always available.

We also adjust the 1920-24 data to be in 1911 prices, however the trade categories reported in Annual Statement of the Trade of the United Kingdom become more detailed after 1920 with the quantities sometimes being reported in different units of measurement. For example, this might be a change from "cwts." before 1919 to "pairs" after 1920 as the unit of measurement. Accordingly, we construct a separate price index along the same lines for 1920-24 (with the start

Figure E.1
Real British Exports



Notes: British exports to main non-European destination countries in million 1911GBP for the years 1913, 1917, 1921 and 1924. Source: Annual Statement of the Trade of the United Kingdom

year being 1920) and than adjust the values after 1920 to be in 1911 prices based on combining the 1911-19 and 1920-24 price indexes. This of course means we are only able to adjust for overall inflation between 1919 and 1920, but not category specific price changes. Accordingly, if there is considerable differences in inflation across products this will create measurement error in the constructed trade data for after 1920. Note however, that the data after 1920 is not used for our main explanatory variables, but mostly for descriptive purposes.

To formally assess the exogeneity of the WW1 trade shock we collect data on British imports and exports to the World, and the top-5 non-European trade partners (Argentina, Australia, China, Japan an the US) for 1911-1924 from Annual Statement of the Trade of the United Kingdom. Figure E.1 depicts British exports to the 6 main non-European destinations. It highlights the crucial role of India as a market for British exports and illustrates the general decline in British exports during WW1 and the subsequent recovery after the war across all countries (except the US). We use this data on British exports 1913-17 to other destinations at the industry level as instrument in Table B.2 to confirm the exogeneity of the India-Britain trade shock during WW1. Figure E.2 additionally illustrates this for the industry level. The left panel depicts the relationship between the decline in British exports 1913-17 to India per employee in Indian industry and the ratio of Indian industrial employment 1921 compared to 1911 across industries. The right panel present the corresponding relationship between the decline in British exports

Figure E.2
Exogeneity of WW1 trade shock across industries

Notes: Change in British exports to India (left-panel) and the rest of the World (right-panel) per Indian worker and ratio of employment in 1921 to 1911 across Indian industries (y-axis). The corresponding first stage between the x-asis in the left and right panel is 0.269***. All axis are transformed using a symmetric log transformation: we take the log of the absolute value plus 1, and than multiply by the original sign. These transformations are done to make variations along the x- and y-axis easier to view. The circle size reflects the number of industry employees in 1911. The term industries refers to the 95 trade industry categories in our dataset that have been merged out of the industry sectors reported in the Census of India and the product categories from the Annual Statement of the Trade of the United Kingdom.

1913-17 to the rest of the World per employee in Indian industry and the ratio of Indian industrial employment 1921 compared to 1911 across industries. This highlights that the change in British trade across industries was driven by developments in Britain affecting both trade to India and the rest of the World.

Finally, we collect disaggregated data on Indian imports from Japan and the USA between 1911-21 from the "Annual Statement of the Sea-Borne Trade of British India with The British Empire and Foreign Countries" (see Department of Statistics 1911-1921). This allows us to analyse formally whether other countries compensated for the drop in imports from Britain (see

also Figure A.1). The "Annual Statement of the Sea-Borne Trade of British India with The British Empire and Foreign Countries" is also the source of the data on machinery imports by type from the USA in 1913 and 1921.

E.2 Supplemental: Employment and Ownership Data

To assess the effect of the WW1 trade shock on Indian industry, we need data on industrial employment by Indian districts, and by sectors that can be matched to our trade categories, before and after the war. The most detailed source of this data are the industrial censuses of 1911 and 1921 (see Census Commissioner 1911, 1921), which were run alongside the main population censuses. They provide information on employment in establishments with more than a threshold number of employees (20 in 1911, 10 in 1921), by sector and district, covering the most developed part of the British Raj and more than 78% of its population. We collect data from the censuses of Bengal, Bihar & Orissa, Bombay, Central Provinces & Berar, Madras, Punjab, and the United Provinces of Agra & Oudh. In addition to the British ruled districts of these provinces, the 7 censuses also include information on 44 Indian princely states inside the surveyed area. The area of British India not covered in our dataset are the censuses individually collected by a set of larger princely states as well as the censuses for the smaller provinces Ajmer-Merwara, Adanamans and Nicobar, Assam, Baluchistan, Burma, Coorg and the North-West Frontier province.

The collected census data covers not only industrial factories, but also mines and plantations growing "special products" (of which tea accounted for 87% of employment in 1911, and coffee, indigo and rubber for much of the rest). Notably, plantations were in most cases involved in directly processing the agricultural products they produced, which explains why they are covered within industrial firms and makes them distinctly different from usual agricultural production. Thus, the 262 sectors for which we have data can be divided into three broad groups: manufacturing sectors, and sectors producing respectively food and raw materials (though not all such goods are represented in the data, e.g. basic agricultural products such as wheat are not, while the processing of wheat into flour is).

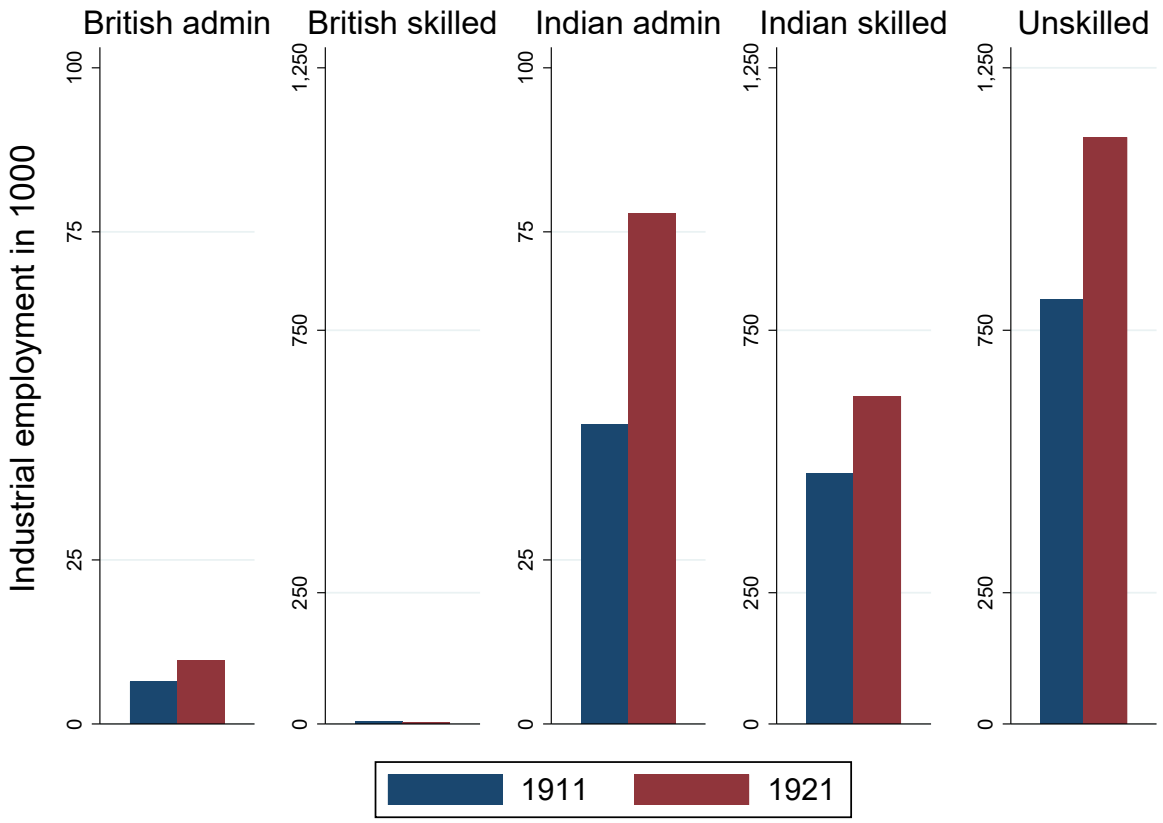
The data in the census comes by establishment types, and some types encompass two or more sectors. In these cases, we allocated their employment to sectors by weighing it by the inverse of the number of products produced. For example, half of the employment in "Cotton Spinning and Weaving"establishments was allocated to the "Cotton Yard/Thread" sector, and half to the "Cotton Fabric" sector.

After this we proceed with matching the census and trade data in four steps. First, we match all trade categories and census industrial sectors that are a perfect match. Second, we aggregate up groups of trade categories which together either comprise a perfect match with a broader census industrial sector, or at least a substantial subset of products of that sector. Third, we aggregate up groups of census industrial sectors to match broader trade categories. Finally,

where this is not suitable we weight broader trade categories by the set of products included and match them to narrower census industrial sectors.

There are census sectors that are not matched to any trade category, for one of the following three reasons: 1) the sector produces a non tradable good, e.g. "Waterworks"; 2) the sector produces a good that is potentially tradable, but does not appear to be traded between Britain and India, e.g "Ice factories"; and 3) the sector does not match to any trade category because of a definition issue: this is the case for the census industrial sector "Bleaching and dyeing factories" which refers to a part of the production process of textiles of different materials (e.g. cotton, jute, wool), while in the Annual Statement of the Trade of the United Kingdom textiles are reported by the material. The first two cases are by far the most frequent. This provide us with an additional 45 non-traded sectors.

Figure E.3
Industrial employment across occupations



Notes: The figure displays industrial employment in India for 1911 and 1921 by occupation and nationality. Employment numbers are reported in thousands. Source: Census of India

From the 1911 and 1921 censuses, we also collect data on some additional industry breakdowns. We collect data on industrial employment by occupation and ethnicity. The breakdown is into administrative staff (including all employees related to direction, supervision and clerical work), skilled workers and unskilled workers. In addition, employment in administrative

staff and skilled workers is further subdivided into Indian and British workers. Indian also includes a small fraction of worker from other non-European countries and British includes also other Europeans as well as Anglo-Indian workers. Figure E.3 presents the aggregate employment numbers for the different categories as reported for 1911 and 1921. Notably, nearly all skilled and unskilled workers employed in factories are Indians, while British administrative staff accounts for 12.3% of total administrative staff in 1911 and 11.1% in 1921.

Figure E.4
Firm ownership by type

Notes: Number of firms across different types of ownership in 1911 and 1921. Firms covered changes from at least 20 employees in 1911 to at least 10 employees in 1921. This likely contributed to the rise in Indian privately owned firms reported. Even without this reclassification (attributing all firms in 1921 reported with 10-20 employees to be Indian privately owned) the number of Indian privately owned firms would have at least doubled compared to 1911. Source: Census of India

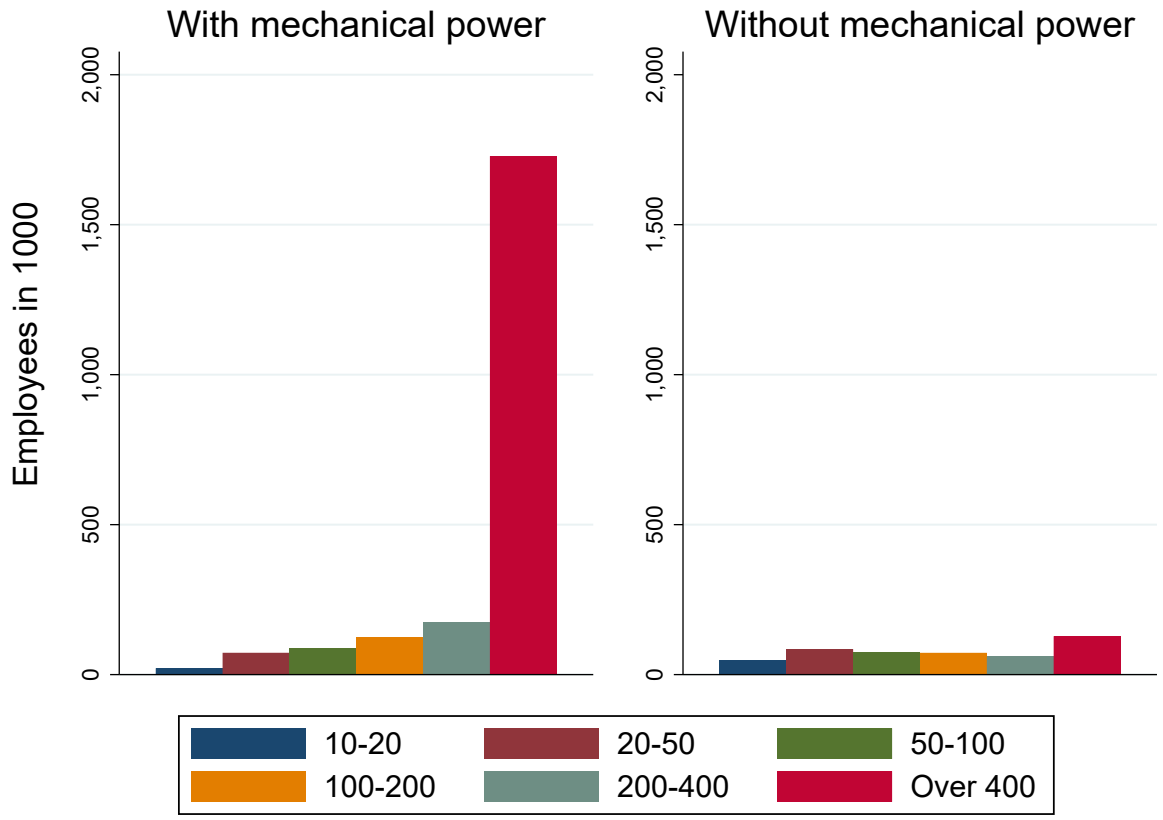
Data for ownership is also collected from the Census of India. However, the data is not provided at the district level, so that we collect the data on ownership for each province broken down by industry categories. For all data sources, apart from the Bombay 1911 census, the industry categories provided for the ownership data are nearly identical to the ones provided at the district level for firms and employment numbers. Accordingly, we match the data from the

province-industry cells to the respective district industry cell, weighting the data by number of firms in the district industry cells. This gives us a good approximation of the number of firms in different ownership groups at the district level for 1911 and 1921. The following main types of ownership groups are reported in the census: (i) firms that are privately owned by a single individual, (ii) firms which are owned by a company with a set of directors and (iii) government owned firms. Group (i) privately owned firms is broken down into British and Indian owned firms, where the category British includes all Europeans and Anglo-Indian owners. For Indian privately owned firms ownership is further broken down by caste, but we do not utilize this information. Group (ii) firms owned by a company with a set of directors is further divided into the directors being exclusively British or Indian or from both groups. We than construct shares of ownership and total numbers of firms owned by each of these categories of ownership at the district level for 1911 and 1921. This is depicted in Figure E.4. Note that the threshold of included firms changed between the 1911 and 1921 census while the majority of firms appears to be covered in 1911 and 1921 this might in part contribute to the strong rise in reported Indian privately owned firms. However, even when subtracting all firms with 10-20 employees in 1921 reported for the whole of India from the Indian privately owned firms ownership would still have increased to more than 4000 firms (suggesting at least a doubling in Indian privately owned firms between 1911 and 1921). For each province apart from Bombay we also construct the change in the number of firms owned between 1911 and 1921 for each of these groups. We are unable to do this for the Bombay 1911 census as the ownership data reports industry categories only at a more aggregated level and does not cover all industry categories.

The data has two important limitations. The first issue is that the threshold above which establishments were included in the census decreased from 20 employees in 1911, to 10 in 1921. This mechanically increases our dependent variable, by adding firms that were in the 10-20 brackets both in 1911 and in 1921, and by not excluding firms which were in the 20+ bracket in 1911, but moved down to the 10-20 bracket in 1921. To the extent that these firms were more numerous in districts more exposed to the shock, this would lead us to overestimate our coefficient. Based on aggregate data, this issue does not seem to be a major concern, since firms in the 10-20 brackets account for only 2.5% of industrial employment in 1921 (see Figure E.5). That this is not a severe issue is also confirmed by using Department of Industry 1897-1948 as a complementary data sources were this is not a problem (more detail in Section E.3). The second issue that arises is that boundaries of some districts changed between 1911 and 1921. To deal with this, we lump together districts that have undergone changes of territory affecting more than 2% of the population of any individual district. We do this by comparing the population figure of a district in 1911, to the one reported for 1911 in the 1921 census, since the latter figure refers to contemporary (1921) district boundaries. The 1921 census also provides information on important boundary changes that occurred since 1911. For example, if district A has lost considerable territory and population to adjacent district B between 1911 and 1921, then we consider A and B as a single district both in 1911 and 1921. Accordingly, we construct 235

districts out of an initial 257 (253) districts reported in the 1911 (1921) census. The remaining changes predominantly occurred due to natural changes in boundary rivers and corrections of previous surveying errors. The average district in our dataset has a population of 1 million inhabitants and an area of 5 thousand square miles.

Figure E.5
Employment by firm size and power used



Notes: The figure presents total employment by firm size and power used for the whole of British India, as reported in the 1921 Census (thus, it includes both our traded and non traded sectors). Source: Census of India

E.3 Supplemental: Factory Report and Modern Indian Census Data

The first Factory Act in British India went into force in 1881 which covered premisses with (a) power driven machinery and (b) more than 100 employees with indigo, tea and coffee plantations having been exempt (See Prideaux 1917, p. xi). An amendment in 1891 reduced the employment cut off from 100 to 50 employees and the local government was allowed to designate establishments as factories of more than 20 employees through notification in the official Gazetteer. Mines were exempt and covered by the 1901 Mines Act. The 1911 factories act introduced considerable regulatory changes, but did not alter the coverage of factories. This

was only done by the 1922 Indian Factories Amendment Act, which reduced the general coverage to at least 20 employees and the threshold for declaration by the local government to 10 employees (Turner 1923). The exemption of plantations and mines remained unchanged. No changes of importance for establishments or classes of workers were made in the 1923 and 1926 amendments (See Kapur 1949, p.2). The 1934 Factories Act replaced the 1911 Factories Act after implementing recommendations made by the Royal Commission on labour in India, which than received minor amendments in 1944, 1945, 1946 and 1947 (See Kapur 1949, p.2). The 1934 Factories Act also reduced the threshold for factories to be covered in general to at least 10 employees and any establishment with at least 5 employees could be declared a factory. Census statistics on power usage and employment by firm size for the whole of India in 1921 suggest that the employment in firms of 10-20 and 20-50 employees only accounted for a minor proportion of employees (2.5% and 5.8%, respectively), and even less in firms using mechanical power (see Figure E.5). So that the threshold changes likely only had a minor effect. Following independence Pakistan kept the 1934 Factories Act, while India replaced it by the 1948 Factories act getting rid of exemptions and changing coverage to (i) any establishment with ten or more workers with the aid of power and (ii) twenty or more workers without power (See Kapur 1949, p.28). The pre-independence Factory Reports covered British ruled areas reporting statistics at the district level, but excluded de-regulated territories and scheduled districts therein. The Factory Reports also provides a sectoral breakdown, but only at a coarser level compared to the Industrial census. This is why we use it only as a secondary data source as this is not a problem for the construction of our dependent variable (where we only need district-level aggregate industrial employment).

Eventough the coverage of the Factory Reports data is narrower than the Census data we collected, it provides us with a measure of industrialisation that is consistent over time (at least for 1911-1921), and allows us to look at shorter as well as longer time periods. We were able to collect data for 1901, 1911, 1913, 1915, 1917, 1919, 1921, 1926 and 1936. We choose the 2-year intervals between 1911 and 1921 to have (i) a pre-war period covering 1911-13 to rule out any pre-trends (also using 1901), (ii) the periods 1913-15 and 1915-17 to analyse the time-horizon of the trade disruption to start affecting industrial employment growth, (iii) the period 1917-19 for analysing the effect during the transition from war to peace and (iv) 1919-21 to cover a full period of peace after the World War I and to match the time-horizon of the Census data. After 1921 we collect data at longer time intervals to study the long-run effect of the WW1 trade shock.

To be able to study industrial employment up to today we augment the information from the Factory Reports by data collected from the post-Independence Census of India in 1951 and 2011 (Census Superintendent 1951; Census Registrar General 2011).[60] Our data focusses on

[60]The partition of India and the need to aggregate some districts that underwent considerable boundary changes are the reasons for the smaller sample size of 132 districts after independence.

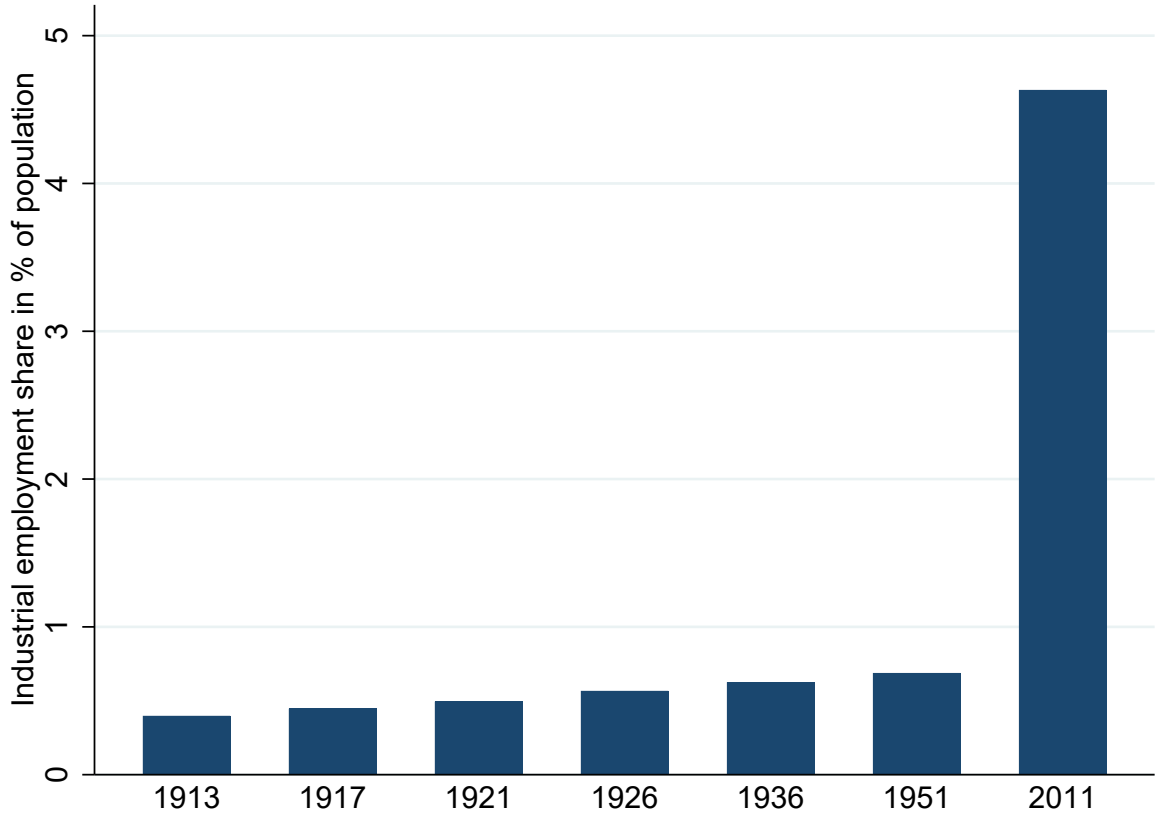
employers and employees (not including independent workers) in 1951 and main-workers in non-household industries (not including household industries and marginal workers) in 2011. This appears the most consistent classification as enumerated workers still exclude artisans.[61] However there is no longer a cut-off for minimum employment in the census so that all firms with at least one employer and one employee are included in the industrial employment share in 1951 and 2011. The industrial categories used from the 1951 Census are Division 2 "Processing and Manufacture- Foodstuffs, Textiles, Leather and Products Thereof", Division 3 "Processing and manufacture- Metals, Chemicals and Products thereof" and Division 4 "Processing and Manufacture- Not elsewhere specified" of the table on "employers, employees and independent workers in industries and services". The not included division are 0 "Primary Industries- Not elsewhere specified", 1 "Quarrying and Mining", 5 "Construction & Utilities", 6 "Commerce", 7 "Transport, Storage and Communications", 8 "Health, Education, Public Administration", 9 "Services- Not elsewhere specified". In 2011 we use divisions 10 "Manufacture of food products" to divisions 33 "Repair and installation of machinery and equipment" of the table on "industrial classification of main workers in manufacturing processing, servicing and repairs by household industry and non-household industry 2011". The not included categorise are 45 "Wholesale and retail trade and repair of motor vehicles and motorcycles" to 99 "Activities of extraterritorial organizations and bodies". The selected set of industries should reflect a consistent set of manufacturing industries that are reported in the Factory Reports, the 1951 Census and the 2011 Census. Accordingly, the decrease in the employment threshold of coverage (similar to revisions in the Factory Act in 1922 and 1932) reflects the only change in coverage. Figure E.6 illustrates the industrial employment share over time. Note, the industrial employment share is less than 1% of the population up to 2011 when only considering industrial employees and not artisans.[62] It highlights that changes to classification did not lead to a sudden jump in industrial employment numbers between 1913-51. This again is consistent with Figure E.5 which highlights that most industrial employment (excluding artisans) is in large firms with more than 400 employees.

Finally, we collect information on the total number of accidents reported in 1913, 1917 and 1921 across districts from the Factory Reports. The Bombay Factory Report of 1917 refers to the recorded accidents (28 fatal, 75 serious, 819 minor) in the following way: “The fatal accidents amounted to 27 caused the death of 28 persons. Of the fatal accidents, 9 were due to

[61]Note that for 1951 we continue using total population to construct the share of industrial employment, while in 2011 due to the introduction of compulsory schooling in India up to the age of 14 we use the population available to work, which consist of all workers, all marginal workers and all non-workers available to work. This considerably improves the precision of our estimate compared to using the total population in 2011.

[62]For example in 1951 artisanal (independent) workers account for 60% of total industrial employment (6 million in Divisions 2-4 in our sample).

Figure E.6
Industrial employment share over time



Notes: The figure presents industrial employment as share of the total population over time. For consistency, it depicts the mean industrial employment share across the 132 districts of modern India which our data covers past-independence. Source: Department of Industry 1897-1948; Census Superintendent 1951; Census Registrar General 2011

machinery and the remainder were due to other causes, chiefly through gross carelessness on the part of the operatives. All accidents unconnected with the machinery and of very trivial nature have been excluded from this report. But fatal accidents of all kinds have been included." The main cause of fatal accidents appears to be workers being caught by the line shaft (for power transmission) of machinery. Notably, information on shifts and working hours suggests most firms had similar hours of work and holiday set at the maximum level allowed with there being no substantial change in the rules or exemptions provided observable across time. This suggests the number of accidents provides a decent proxy for the workforces knowledge of handling the machinery on-site.

E.4 Supplemental: Political Data

For political attitudes we use the data given in the civil disobedience enquiry committee report (Indian National Congress 1922) set up by the Indian National Congress in 1922. Witnesses

were heard on the committee's tour through India from the 30th of June toll the 16th of August. The main question focusses on support for civil disobedience with Table E.1 summarising the answers given. The answers range from supporting the immediate start of mass civil disobedience to being against any form of civil disobedience on principle grounds. Some respondents also provided a mix of answers from either category A-E or F-G, but those two groups are mutually exclusive. Accordingly we code an individual as supporting immediate civil disobedience of any form as 1 and an individual stating that his area is not ready for civil disobedience or opposes it on principle as a 0.

Table E.1
Responses given in civil disobedience enquiry

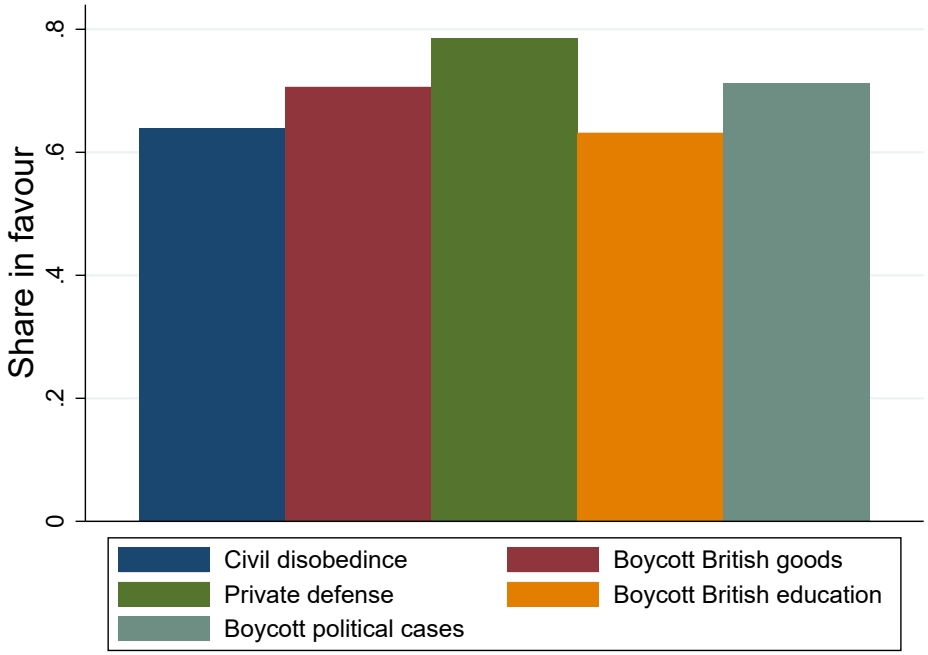
Nr.	Nature of Evidence	Immediate action	Witnesses
A	For immediate Mass Civil Disobedience	1	4
B	For immediate non-payment of taxes generally	1	3
C	For immediate Civil Disobedience limited to particular taxes and laws	1	5
D	For immediate Aggressive and Defensive Individual Civil Disobedience	1	100
E	For immediate Individual Defensive Civil Disobedience only	1	131
F	For Provinces or Districts not yet ready for Civil Disobedience in any form	0	161
G	Against any form of Civil Disobedience on principle	0	9

Notes: Responses given by witnesses on attitudes towards civil disobedience. The list only gives the unique responses. Some individuals gave as a response either a mix of answers A-E or F-G, but there is no overlap between the 2 groups. Accordingly we code the responses into either supporting immediate civil disobedience of any kind or not. Source: Indian National Congress (1922)

The remaining responses given on the boycott of British products, the use of private defence, the boycott of British education and the boycott of courts in political cases are all either reported as "for" or "against". Accordingly, these questions are all coded as 1 for support or 0 for being against the measure. Figure E.7 highlights that there is considerable variation in the responses given.

We match the political data to districts by the information on town or district provided for as many individuals as possible. We always attribute the WW1 trade shock based on the district even in cases where a representative represents a wider area than the district of residency. This occurs for example in cases where a representative is part of the provincial or the all India

Figure E.7
Share of respondents in favour of question



Notes: Share of respondents reporting answers A-E (coded as in favour) of the question of civil disobedience and reporting "in favour" on the question of boycott of British products, private defence, boycott of British education and boycott of courts in political cases. Source: Indian National Congress (1922)

congress committee. The report also provides information on the provincial congress committee the interviewed person is from. This also acts as a control for the point in time the interview was conducted as it reflects the itinerary of the committee starting from Delhi over Madras to Calcutta with the aim of being representative of as much of India as possible. We are able to match up to a maximum of 257 individuals that provided a response to any of the outlined questions to our districts, which is about slightly above half of the maximum of 467 answers provided. This lower matching rate is due to three reasons: (i) There is no information provided on the origin of the individual. (ii) The individual is from an area outside the 7 major-census provinces we use in constructing our trade shock. (iii) A town/village is reported which is not covered in the 1921 census and can not be matched to a district (the smallest towns reported are classified as cantonments with a population of above 200 individuals). Reason (i) is by far the most common one. Figure A.4 depicts the geographical variation on support for civil disobedience across districts for which responses are recorded.

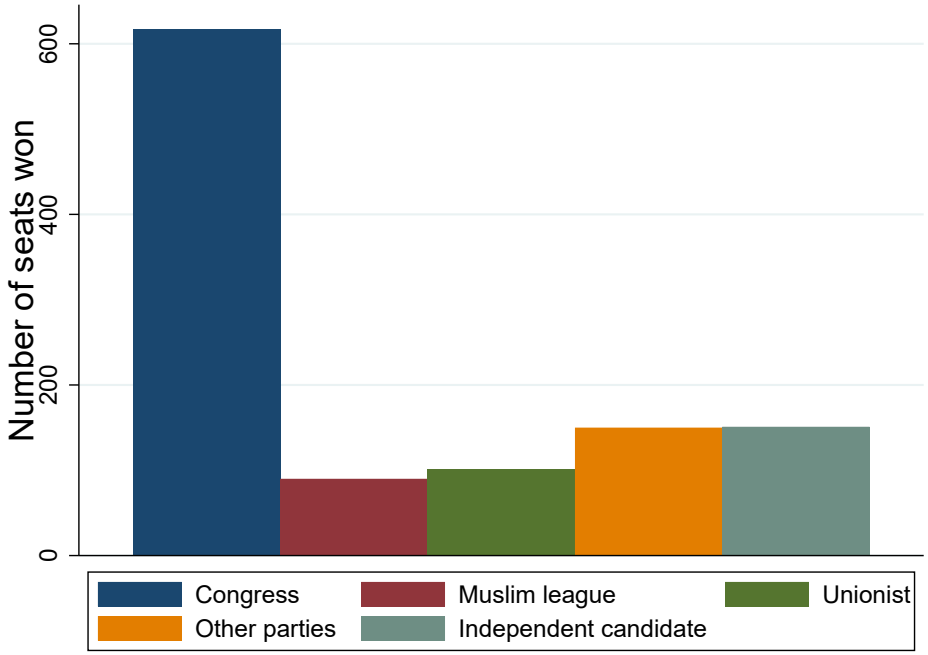
The second political data source we use are the provincial legislative assembly elections (India Office 1937). The 1937 provincial legislative assembly elections are the first elections held in British India in which a considerable share of the population was able to vote (around

1/6th of the adult population) as the Government of India Act 1935 had considerably increased the franchise. The elections were held for eleven individual legislative assemblies: Assam, Bengal, Bihar, Bombay Presidency, Central Provinces, Madras, North-West Frontier Province, Orissa, Punjab, Sindh and United Provinces with our collected census data covering all of these provinces apart from Assam and the North-West Frontier Province.

The winner of a specific seat was determined by having gained the highest number of votes in a constituency (first-past-the-post system), however the constituencies were not purely based on geographic boundaries, but also based on religion or reserved for some powerful interest groups (e.g. landowners, trade unions, universities). We focus on "General" and "Muhammadan" constituencies that provided elected representatives for the two main religious groups: Hindus and Muslims. This is done for two reasons: (i) they represented the two groups credibly vying for power after independence (which is reflected in the formation of India and Pakistan) and (ii) they are the only groups in homogeneous and geographically detailed constituencies across the whole of India enabling us to match Census data precisely to 1937 constituencies. The electoral system of the 1937 election is further complicated by some constituencies having more than one seat. These multi-seat constituencies were created to reserve seats for scheduled castes and tribes, Mahrattas or women as well as to avoid sub-dividing districts with large minorities into several small constituencies which would divide their voting power and deprive them of all chance of representation (see Indian Delimitation Committee 1936, Chapter 2 & 3). Further, the Bombay and Madras presidencies also had some multi-seat constituencies without reserved seats. For this reason, the clear first-past-the-post system in single-seat constituencies was augmented by the following three voting possibilities in multi-seat constituencies: (i) Single, non transferable vote: each voter had only one vote. This was perceived as providing more protection for minorities without a protected seat, (ii) Distributive vote: in an n-seat constituency each voter has n-votes, but can cast at most one vote per each candidate and (iii) Cumulative vote: in an n-seat constituency each voter has n-votes, and is free to cast them all for one candidate.

For matching the trade shock and other controls across districts to the 1937 election outcomes we use information on the mapping of constituencies, taluks (sub-divisions of districts) and towns from the "Report of the Indian Delimitation Committee" (Indian Delimitation Committee 1936) and the Census of India to match a unique district to the (usually smaller) constituencies. For the 43 constituencies (out of 878) which span multiple districts we use equal weights to match the district level information to the respective constituency. As an example the General-Urban constituency of "Bulandshahr-cum-Meerut-cum-Hapur-cum-Khurja-Nagina Cities" includes cities from the two districts of Bulandshahr and Meerut. Accordingly, we assign a weight of 0.5 to the two districts to construct the trade shock and controls for the constituency of "Bulandshahr-cum-Meerut-cum-Hapur-cum-Khurja-Nagina Cities" (we do not use population weights as we do not know the number of eligible voters for districts).

Figure E.8
Results of 1937 legislative assembly elections



Notes: Number of seats won by the respective party in the 1937 province legislative assembly elections in our sample. Source: India Office (1937)

We focus on whether a party won a seat or not rather than the vote share as the party affiliation and number of votes polled are only reported for the successful candidate in the "Return showing the results of elections in India 1937" (India Office 1937). Figure E.8 presents the success –in terms of seats won– of the different parties across the constituencies in our sample. The INC appears to have been the only party that was well organized and fought the elections on a national front with the aim of the party being an independent and united India (Pandey 1978). This nation wide campaigning is reflected in the INC's dominant share of seats won. The remaining parties were much less organized and had less clearly defined political goals. The independent candidates represent a wide spectrum of varied opinions of which at least 10% of the successful candidates were clearly leaning towards either the INC or the Muslim league. The Muslim League's main standpoints in the 1937 election appear to have been similar to the Congress election programme, but with the especial emphasis on the protection of minority rights and the claim to be the representative of the Muslim electorate (Pandey 1978; Moore 1983; Kulke & Rothermund 2016). Despite winning the second most seats of all parties its number of seats won were far behind the INC's (see Figure E.8). This poor election result was suggested to be one of the reasons for the Muslim League to undertake a considerable transformation becoming clearly in favour of the creation of an independent Muslim state after the 1937 election (Moore 1983; Kulke & Rothermund 2016). The third most successful party and

the one most clearly in favour of cooperating with British authorities was the Unionist party representing the interests of landlords. We here combine the votes of the Unionist and United parties as the United party had been modelled along the lines of the Punjabi Unionist party following the formation of Sind in 1936. As the Unionist party won less seats than the Muslim League on its own we refer to it as the third biggest party. Most of the remaining seats in the block of other parties were won by minor parties covering a vast spectrum of Hindu nationalists, smaller Muslim and other religious parties, anti-feudal parties, parties advocating for schedule cast rights and socialist and communist parties.

E.5 Supplemental: Other Data

In addition to the data already discussed, we collect data on number of World War I deaths by district from individual records of the Commonwealth War Grave Commission (where origin was reported). The variable for whether a district is coastal is constructed based on our geographical shape-file. The shapefile itself was digitized based on the "Map of India (Showing Provinces and Districts) in 1915" depicting the whole of British India published by the Surveyor General of India in combination with other maps when required. We than collapsed our digitized map to depict the merged district boundaries used in the baseline specification. Other baseline controls (number of persons employed in the army, navy and police, living in urban areas, being literate in English or any language and aged over 20 years) are collected from the census in 1911 (see Census Commissioner 1911, 1921).

Table E.2
Summary Statistics

	Mean	Std. dev.	10th Perc.	90th Perc.	Valid obs.
Panel A. Baseline variables					
Δ Industrial empl. share	0.17	0.76	-0.04	0.52	235
EX-IM Shock	0.11	0.57	-0.00	0.20	235
Industrial empl. share 1911	0.64	2.14	0.00	1.06	235
Military share 1911	0.21	0.61	0.00	0.58	235
Urban share 1911	10.43	14.00	0.90	20.44	235
Coastal	0.15	0.36	0.00	1.00	235
Literate share 1911	5.50	4.04	2.55	9.75	216
Literate English share 1911	0.72	1.64	0.11	1.13	216
Age 20+ share 1911	53.59	3.27	49.28	57.13	216
Panel B. Composition industries & trade shock					
Δ Industrial empl. share (traded)	0.16	0.77	-0.05	0.42	235
Δ Industrial empl. share (non-traded)	0.01	0.09	-0.01	0.05	235
Δ Industrial empl. share (raw mat. & food)	0.02	0.58	-0.05	0.13	235
Δ Industrial empl. share (manufacturing)	0.14	0.48	-0.01	0.31	235
IM Shock	-0.12	0.54	-0.15	0.00	235
EX Shock	-0.01	0.17	-0.01	0.03	235
Export raw materials & food	-0.02	0.17	-0.01	0.01	235
Import manufactures	-0.12	0.54	-0.15	0.00	235
Panel C. Employment & ownership composition variables					
Δ British admin empl. share	0.00	0.01	-0.00	0.00	235
Δ Indian admin empl. share	0.01	0.04	-0.00	0.05	235
Δ British skilled empl. share	-0.00	0.00	-0.00	0.00	235
Δ Indian skilled empl. share	0.06	0.26	-0.03	0.19	235
Δ Unskilled empl. share	0.10	0.66	-0.05	0.36	235
Δ Nr. firms	26.52	52.08	0.00	72.00	235
Δ Nr. private ownership (English)	0.24	4.44	-1.06	2.26	198
Δ Nr. private ownership (Indian)	22.91	40.28	0.00	74.22	198
Δ Nr. Directors	2.01	9.37	-2.68	7.89	198
Δ Nr. goverment ownership	0.62	2.63	-0.30	2.12	198
Panel D. Factory report industrial employment					
Δ Industrial empl. share 1913-15	0.03	0.12	-0.03	0.06	191
Δ Industrial empl. share 1913-17	0.04	0.18	-0.04	0.12	191
Δ Industrial empl. share 1913-19	0.08	0.27	-0.02	0.15	191
Δ Industrial empl. share 1913-21	0.11	0.36	-0.02	0.22	191
Δ Industrial empl. share 1913-26	0.17	0.48	-0.01	0.35	191
Δ Industrial empl. share 1913-36	0.21	0.56	-0.01	0.45	191
Δ Industrial empl. share 1913-51	0.29	0.56	-0.09	0.79	132
Δ Industrial empl. share 1913-2011	4.23	3.43	1.32	8.86	132

Summary Statistics contd.

	Mean	Std. dev.	10th Perc.	90th Perc.	Valid obs.
Panel E. Individual responses civil disobedience report					
Pro civil disobedince	0.64	0.48	0.00	1.00	227
Private defense	0.79	0.41	0.00	1.00	140
Boycott British goods	0.71	0.46	0.00	1.00	92
Boycott British education	0.63	0.48	0.00	1.00	144
Boycott political cases	0.71	0.45	0.00	1.00	139
Panel F. Results 1937 provincial election					
No of Seats	1.26	0.58	1.00	2.00	878
Congress Seats	0.50	0.50	0.00	1.00	878
Independent Seats	0.15	0.36	0.00	1.00	878
Muslim League Seats	0.10	0.30	0.00	0.00	878
Unionist Seats	0.11	0.31	0.00	1.00	878
Other Party Seats	0.14	0.35	0.00	1.00	878

Notes: Summary statistics for main variables of interest. Panel A provides information on the variables used in Table I. Employment shares are shares in total population. Panel B provides information on variables measuring the composition of employment growth and the trade shock by sector. Panel C provides information on variables related to nationality of employment and ownership. Panel D provides information on industrial employment change across time periods. Panel E provides information on individual answers given in the civil disobedience report. Panel F provides information on the outcome of the 1937 election.

Table E.3
Classification industries

	Import competing	Export	Import competing & export
Food	Dairy; Fish; Meat; Potatoes; Salt	Coffee, Raw; Pepper; Pigeon pea/Arhar splitting; Tea	Flour; Malt; Rice; Sugar
Raw materials	Coal; Granite; Stones	Copper ore; Cotton, raw; Fibre, raw; Manganese ore; Mineral oils; Rubber	Iron Ore; Manures; Raw Silk; Timber; Vegetable oil; Wool
Manufactures	Aerated Water; Ammunition; Animal Fat; Apparel; Arms; Bicycles; Boats; Boots and shoes; Brewery; Bricks; Brushes; Candles; Caps; Cardboard; Carpentry; Carriages; Cement; Clocks; Condiment; Confectionery; Copper products; Cutlery; Distillery; Electric lights; Electric tramways; Electrical appliances; Embroidery; Felt; Furniture; Glass; Harness; Hosiery; Instruments; Iron products; Jewellery; Leather manufactures; Locomotives; Machinery and Parts thereof; Matches; Medicines; Military products; Motor cars; Motors; Musical Instruments; Painters Colours and Materials; Paper, and Articles of Paper; Perfumery; Pig Iron; Pottery, red; Print; Processed coffee; Saddles; Silk yarn; Slates; Soap; Stationery; Steel products; Tiles; Tin; Umbrellas; Wood Products; Wool blankets; Wool fabric	Indigo; Opium	Animal Food; Chemicals; Coir yarn; Cordage; Cotton fabric; Cotton waste; Cotton yarn; Fibre fabric; Leather; Silk Fabric; Tobacco; Wool carpets
No trade	*Airplane*, Aluminium; Bakery; Buttons; *Chromite*; Cotton carpet; Cotton rope; Dockyards and boat repair; Dyeing and colouring; Electricity supply; Other food, nec; *Plantation fruits*; Gas works; *Cured ginger*; Gold ore; Graphite; *Processed groundnut*; Ice; *Kaolin*; *Kath*; Laundries; *Lead*; Local transport workshop; Locks; Metal typefaces; Other metal, nec; Mica ore; Mica manufactures; Mints; *Other processed grains, nec*; Other plants, nec; Other spices, nec; Public works; Railway servicing; *Rubber products*; Safes; Other stone, nec; Sugarcane; Telegraph; *Telephone*; Tents; Other textile, nec; Toys; Waterworks; Other wood, nec		

Notes: The table presents the 105 matched industries grouped by type of products and type of trade with the Britain and the 45 non-traded categories. Categories in cursive record no employment in 1911.