

Omnia Juncta in Uno: Foreign Powers and Trademark Protection in Shanghai’s Concession Era*

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Abstract

Intellectual property (IP) institutions have been a salient topic of economic research and political disputes. In this paper, we investigate how firms adapt to trademark protection, an under-examined form of IP protection, by exploring a historical precedent: China’s trademark law of 1923—an unanticipated, disapproved response to end conflicts between foreign powers. Exploiting a unique, newly digitized firm-employee-level dataset from Shanghai in 1870-1941, we show that the trademark law impacted firm dynamics on all sides of trademark conflicts. The law spurred growth and brand investment for Western firms with greater dependence on trademark protection. In contrast, Japanese businesses, who had frequently been accused of counterfeiting, experienced contractions while attempting to build their own brands after the law. Further, the trademark law led to new linkages with domestic agents both within and outside the boundary of Western firms and the growth of Chinese intermediaries. At the aggregate level, trademark-intensive industries witnessed a net growth in employment and product variety. A comparison with previous attempts by foreign powers to strengthen trademark protection—such as extraterritorial rights, bilateral treaties, and an unenforced trademark code—shows the alternative institutions were ultimately unsuccessful.

JEL: F2, D2, O1, O3, N4

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“Omnia Juncta in Uno.”

*“All Joined in One” - Shanghai Municipal Seal
International Settlement, established in 1843*

1 Introduction

Disagreements over the protection of intellectual property (IP) have been a prime cause of international political and economic disputes. Firms from developed countries have often urged their governments to negotiate stronger IP protection overseas especially in less advanced economies, while developing nations have longstanding concerns over the implications of IP protection for economic growth and market competition. Within IP-intensive sectors, trademark-intensive industries contribute most to employment (90% in U.S. and 78% in Europe); trademark growth, at an annual rate of 11%, has far exceeded other forms of IP.¹ This economic importance stands in stark contrast to the academic literature, which has focused almost exclusively on patent and copyright protection.

In this paper, we aim to close the gap in the literature and investigate the effects of trademark protection on firm and industry dynamics by exploiting a historical precedent—the unanticipated, disapproved introduction of China’s first trademark law in 1923—and a series of newly digitized micro datasets in Shanghai’s Concession Era that provide rare information on firm operations in one of the world’s most contested markets. The paper takes advantage of both the exogenous trademark institution shock and the availability of detailed firm data to examine how firms, both domestic and from around the world operating on different sides of trademark conflicts, respectively adapt to the birth of trademark institutions.

Different from patents or copyrights, the economic rationale for trademarks is to solve an asymmetric information problem that arises in settings when buyers are unable to observe intrinsic product characteristics at the point of purchase, e.g., product materials or ingredients that affect the quality, safety or durability of the products (e.g., Shapiro, 1982, Shapiro, 1983).² One way to overcome this information asymmetry problem is for sellers to use trade-

¹See USPTO (2016) and EPO and EUIPO (2019).

²As defined by the USPTO, a patent is a “limited duration property right relating to an invention in exchange for public disclosure of the invention” and protects “the right to exclude others from making, using, offering for sale, or selling an invention.” A copyright protects “original works of authorship” in literature, music, art, architecture as well as software. Patents and copyrights address market failures associated with the public good

marks to signal the identity of the producer to the consumer (Grossman and Shapiro, 1988a).³ Trademarks enable firms to build and benefit from reputation over time, but counterfeiting undermines the function and value of this firm-specific asset.⁴ As the jurisdiction of laws is national by nature, counterfeiting poses particular challenges in the context of international trade and commerce.

In this paper, we investigate how the introduction of the trademark law in one of the world's most vital markets had shaped the growth dynamics of firms on all sides of trademark conflicts. At the beginning of the 20th century, China had emerged as the world's most important market for trademark protection due to its market size and absent formal trademark institutions. As noted in the *Manchester Guardian* on June 2, 1904, "perhaps for no market in the world is it more necessary that the trademarks upon our productions should be jealously safeguarded" (quoted in Heuser, 1975). However, unlike most other trademark laws throughout history, the urgent need for trademark protection did not stem from disputes between foreign and domestic businesses or demand from domestic businesses, but rather fierce conflicts between foreign powers (Motono, 2011).

After the Opium Wars, gunboats from Western nations forced Qing China to conclude numerous 'Unequal Treaties' that granted extraterritorial (ET) rights to foreign powers and open new treaty ports such as Shanghai to foreign trade and businesses. Among the foreign powers, British businesses attained early access and dominance in the Chinese market, but this status was soon challenged by Japan after the Treaty of Shimonoseki in 1895. Counterfeits of Western trademarks, especially by Japanese manufacturers, rose rapidly af-

nature of knowledge and aim to provide incentives for innovation and knowledge creation.

³According to the 1875 *Trade Marks Registration Act* of Great Britain, one of the world's first trademark laws, a trademark is "a device, or mark, or name of an individual or firm printed in some particular and distinctive manner; or a written signature or copy of a written signature of an individual or firm; or a distinctive label or ticket."

⁴There are two types of counterfeiting: (i) deceptive counterfeiting where the authentic and counterfeited products are similar in design and packaging and unaware consumers have difficulties distinguishing the two and are deceived to unknowingly purchase (lower-quality) counterfeited goods (such as cigarettes, drugs, and cosmetics); and (ii) non-deceptive counterfeiting where consumers are able to distinguish between authentic and counterfeited products and knowingly purchase the latter (such as counterfeits of luxury goods). In the case of deceptive counterfeiting, the role of trademarks in reducing information frictions would be more limited compared to the case of non-deceptive counterfeiting. Given the historical context we study and the product categories with the most counterfeits and trademarks during that period (e.g., drugs, cosmetics, food, beverage, and tobacco), our paper considers the case of deceptive counterfeiting and the economic implications of the trademark law in such settings where consumers are not able to distinguish authentic goods from counterfeits.

ter the 1890s, leading to a fast-growing volume of trademark disputes involving Western brand firms, Japanese counterfeiters, and Chinese merchants spanning across products from tobacco and textile to food and cosmetics.

At the turn of the 20th century, China's leading economic partners—Great Britain, the United States, and Japan—signed bilateral commercial treaties with China promising to abolish ET if China were to regulate foreign commerce along Western lines, including protection of trademarks. Great Britain and Japan both tried to implant their respective trademark laws involving different filing principles into China. This competition, however, resulted in an indefinite postponement of the trademark law. In May 1923, China surprised foreign governments by passing its first trademark law. The law, completely unanticipated by the foreign community and failing to satisfy the demands of either Western or Japanese government, was broadly rejected and only later unwillingly accepted by foreign powers (Motono, 2011; Patent and Trade Mark Review, 1923). These historical characteristics of the law offer us a unique context and an arguably exogenous institution shock for studying the economic impacts of trademark protection.

The establishment of the trademark law could affect firm and industry dynamics in complex ways. First, trademark protection can lead to a direct market reallocation within brand-specific segments from counterfeiters to authentic producers. Second, trademark protection, by raising consumer confidence of receiving authentic products upon purchase, may increase aggregate consumer demand. Further, unlike patents and copyrights, trademarks protect the rights to use a mark, rather than the rights to make or sell (sometimes similar) products with different marks, and hence may not reduce the extent of market competition. Finally, the trademark law could affect the distribution mode of authentic firms. Due to extensive obstacles like language barriers and inland market restrictions, foreign businesses often had to turn to Chinese agents for expanded market access while at the same time concerned with the risks. The trademark law could mitigate the concerns of foreign authentic firms and foster new linkages with, and the growth of, domestic intermediary sector.

We examine these mechanisms of adjustment by exploring how Western, Japanese and Chinese firms, with their distinct roles in trademark conflicts, adapted to the trademark law. Our analysis takes advantage of a series of novel micro-level datasets from Shanghai—the city that grew to the world's 7th largest city by 1930s accounting for 67% of China's inward FDI in manufacturing and over half of Chinese trade. Specifically, we manually digitized

and assembled an annual business-employee-level panel dataset covering the universe of firms operating in Shanghai's concession areas spanning across 1872-1941. For each company, we recorded its name, address, products, importer and exporter status, nationality, and non-production employees including their names, job positions, and levels in the firm hierarchy. In addition, we downloaded business advertisements in the leading daily Chinese newspaper *Shen Bao* (申报) during 1920-1926 to measure firms' brand investments. Further, we collected comprehensive client information for each agent firm including the name and nationality of each client. The coverage and richness of information from our datasets enable us to provide rare insights on firm operations in one of the most contested markets for trademark protection and investigate how firms adapt to the birth of a trademark institution.

We empirically address the questions by implementing a difference-in-difference (DD) analysis that compares the growth and organization of firms with varying levels of dependence on trademark protection before and after the introduction of the trademark law. We construct a firm-specific measure of trademark intensity based on each firm's initial product composition and historical trademark registration data in each product category in a number of foreign countries before 1922. Given that foreign powers neither anticipated nor approved the introduction of the trademark law, we expect the timing of the law to be exogenous to the growth dynamics of trademark-intensive firms, an assumption that we can test and confirm in a pre-trend analysis.

Our analysis suggests that the trademark law significantly reshaped firm dynamics on all three sides of trademark conflicts. The employment of trademark-intensive Western firms grew, on average, by 5%, while Japanese businesses, in contrast, witnessed an average reduction of employment by 15%. During their adjustments, Western firms became more likely to recruit engineers and manufacturing staff signaling a transition from wholesale to domestic manufacturing, while Japanese firms cut sales staff positions. Western firms were also less likely to exit the market or drop trademark-intensive products and more likely to invest in local advertising after the enactment of the trademark law. Interestingly, Japanese firms also became more likely to post advertisements and add trademark-intensive products to their portfolio, suggesting an attempt to build up their own brands after the law.

The trademark law also transformed the relationships between Western businesses and Chinese intermediaries. The trademark law led to greater domestic integration by Western firms both within and outside the boundary of the firm. After the trademark law, trademark-

intensive Western firms became more inclined to promote Chinese employees within their organizations as well as utilize Chinese employees for sales positions. They also started forming more linkages with Chinese intermediaries and utilizing Chinese agents for market access. These new linkages subsequently fostered a significant growth of the Chinese intermediary sectors.

One of the long-standing concerns of IP institutional reforms is the implications for market competition. Aggregating the data to the product-year level, we show that the trademark law led to a net growth of both total employment and product variety in trademark-intensive industries, implying the impact went beyond a simple reallocation between authentic and counterfeiting firms and entailed positive changes in consumer demand and market variety.⁵

As the 1923 trademark law was preceded by a series of alternative institutional models exploited by foreign powers to address trademark issues, we also compare the effect of the 1923 trademark law to these preceding institutional arrangements including: 1) ET, which can be interpreted as a direct import of foreign legal institutions in China; 2) bilateral commercial treaties; and 3) a draft legal trademark code that had not been put into force. We find that none of the alternative institutional arrangements exerted a significant effect on firm growth, highlighting the importance of the domestic institutional reform.

An extensive literature on IP institutions assesses the effects of patent laws and, to a lesser extent, copyright protection, on economic growth.⁶ In contrast, there has been limited research on the economic effects of trademark protection. The main theoretical work on this topic is Grossman and Shapiro (1988a,b) who analyze the positive and normative effects of counterfeit trade on consumers, firms and total welfare and the implications of policies designed to combat counterfeiting based on earlier work by Shapiro (1982, 1983). Recent work by Heath and Mace (2019) offers empirical evidence on the effects of increased trademark protection on the profits of U.S. firms exploring the 1996 Federal Trademark Dilution Act, which granted additional legal protection to selected trademarks. The paper finds that the

⁵This result is echoed in our ongoing study that quantifies the effect of the 1923 trademark law on consumer welfare using detailed brand-level price series and trademark registrations and a model of information frictions and counterfeiting. The evidence shows that Western brands did not increase prices after the trademark law; instead, brand prices exhibited a slight, albeit insignificant, decline after trademark registrations.

⁶See, for example, Moser (2013) and Sampat (2018) for a comprehensive review on patent institutions and Biasi and Moser (2018), Giorcelli and Moser (2020), Oberholzer-Gee and Strumpf (2007), and Li, MacGarvie, and Moser (2018) for recent studies of copyrights.

Act raised treated firms' operating profits, lowered entry and exit, and reduced innovation and product quality. Qian (2008), examining counterfeiting among Chinese shoe companies, finds that a loosening of counterfeit enforcement led to alternative differentiation strategies by authentic producers, including upgrading product quality and investing in signaling and self-enforcement against counterfeits. Conversely, Kuroishi (2020) finds that the quality of Chinese tyre exports to Africa increased once the African countries joined the Madrid Protocol, which simplified the international registration process for trademarks.

In contrast to previous studies, our paper focuses on a fundamental, rather than incremental, change in trademark protection: the introduction of an entire trademark law. Further, the historical setting explored in the paper provides an arguably exogenous variation in the timing of the trademark law that allows us to establish the causal effect of the law on firm and industry dynamics. In addition, instead of focusing on authentic firms' responses to trademark protection, we investigate how firms on different sides of trademark conflicts, including not only authentic businesses but also counterfeiters and domestic intermediaries, adapt to trademark protection through either competition or cooperation. Our analysis also offers novel evidence on the effect of the trademark law on firm organization and the formation of domestic linkages taking advantage of rich firm-employee and firm-client panel data.

Our paper is also related to an emerging literature assessing the historical patterns of Chinese trade during the treaty-port era, including Jia (2014), Keller, Li, and Shiue (2013), and Keller and Shiue (2020). Studying the long-run development of China's treaty ports, Jia (2014) examines the development paths of treaty ports and their neighbors and the roles of migration and sector-wise growth. Keller et al. (2013) and Keller and Shiue (2020) document the historical patterns in China's trade and FDI, and assess how these patterns compare to those of modern trade and investment.

The rest of the paper is organized as follows. Section 2 describes the historical background and timeline for the birth of China's first trademark law. Section 3 discusses the potential mechanisms through which trademark protection could affect firms and industries and explains the construction of the business-employee panel data and trademark registration dataset. Section 4 presents empirical evidence on firm adaptations to the trademark law. In Section 5, we discuss and compare the effects of alternative institutional arrangements. Section 6 concludes.

2 The Birth of China's First Trademark Law: Historical Background

China's historical use of trademarks can be traced back to the Northern Zhou Dynasty (556-580 A.D.), when merchants began to use different marks to distinguish their products and craftsmanship from others (Chang, 2014).⁷ In contrast to the long history of trademark uses, China's formal institutions to protect trademarks has had a much shorter and complex timeline. Before the late 1800s, protection of trademarks had been governed by the by-laws of commercial organizations (guilds or shanghui) (Alford, 1995).⁸ Trademark protection in pre-1949 China underwent several phases, from the imposition of foreign legal institutions (ET) to bilateral commercial treaties with major trading partners, and from the Qing 1904 code that had not been put into force to finally the 1923 birth of China's first comprehensive trademark law. Below we describe the three phases leading up to the 1923 trademark law.⁹

2.1 The Clashes of Foreign Legal Institutions

After the Opium War, gunboats from Western nations forced Qing China to conclude a series of 'Unequal Treaties' which allowed foreign merchants to trade in Chinese ports, established regulations for the conduct of trade, and granted foreign citizens and businesses extraterritorial rights, sometimes known as consular jurisdiction. Cases in which foreign companies with ET were defendants would be tried at their respective Consular Courts in Shanghai following the laws of their home country, while other cases would be tried in the "Mixed Court" following Chinese jurisdiction. This led to the coexistence of up to 22 different legal systems in Shanghai, depending on which treaties got signed, expired, or were renewed. The laws that specific firms had to adhere to changed over time and depended on the nationality of involved parties. The coexisting legal systems and consular courts led to a complex "legally pluralistic environment," and often competed for jurisdiction.

Around the same time, China had emerged as one of the most important markets for trade and a major source of economic hope for Western merchants and manufacturers (in particular, Great Britain) which attained early entry and dominance in Chinese imports. This

⁷Porcelain and ceramics are one of the oldest industries in which such marks had been used for centuries (Heuser, 1975).

⁸Written Chinese law (e.g., the Great Qing Code) referred very little to the regulation of private economic activity (Kirby, 1995), with the main exceptions being the rules preventing monopolies and unfair trading.

⁹We refer interested readers to Motono (2011, 2013) for a comprehensive account of the history behind the trademark system.

dominance was then challenged by Japan which gained extraterritorial rights after the end of the first Sino-Japanese War in 1894–95 and the Treaty of Shimonoseki in 1895. As Japanese firms lagged technologically behind their Western rivals, they were sometimes found to manufacture counterfeits of Western goods and infringe on Western trademarks.¹⁰ Western-Japanese conflicts surrounding trademark started when Great Britain discovered a series of Japanese counterfeits in early 1900s.¹¹ Great Britain immediately attempted to protect their trademarks by asking British firms to register trademarks in their Chinese and Japanese consulates. The marks were then transmitted to be recorded at the Imperial Maritime Customs Service. However, this form of protection proved inadequate because neither the consulate nor the record office had a legal basis to enforce compliance with its rules.

In practice, this resulted in different trademark protection of Western firms against Chinese versus Japanese firms. If a trademark lawsuit was made against a Chinese business, it went to the Mixed Court in Shanghai, which had tended to enforce the protection of trademarks registered at the Customs.¹² However, if the case was against a firm who enjoyed ET, such as Japanese firms, the case was dealt with at the consular court, which tended to enforce trademark protection to a lesser extent. As noted in the *Daily Consular and Trade Reports* on October 30, 1923, “the difficulty in the matter of infringements does not generally arise among the Chinese, with whom the authorities are usually prompt to deal in cases of infringement, but with certain European and Oriental manufacturers who put on the China market merchandise which it is claimed by representatives of American manufacturers violates American trade-mark and patent rights.” This intensified Western-Japanese tensions.

¹⁰For example, the *Patent and Trade Mark Review* (1907) argued that “Japanese trade in China consists largely of Japanese imitations, both undisguised and colorable, of foreign goods. The trade is assuming the dimensions of a great national industry.”

¹¹See *Motono* (2011) for a detailed description of some notable cases including, for example, *Sir Elkanah Armitage Sons Ltd. vs. Konishi Hanbei* and the “Peacock” brand by *British American Tobacco vs. the “Peafowl” brand by Sanlin Gongsi*. The *North China Herald* also reported additional prominent cases such as *British Whiskey brand “Black and White” producer J. Buchanan Co. vs. an Osaka spirit merchant*.

¹²For example, *Heuser* (1975) noted that “In case of infringement by Chinese subjects it was possible to obtain injunctions by the Chinese authorities... The British minister mentioned in a dispatch to the Foreign Office that ‘the Chinese Courts... as they have done in the past, afford substantial protection against imitation on the part of Chinese subjects’.”

2.2 Bilateral Commercial Treaties and Failed Negotiations

In 1902 Great Britain signed a commercial treaty with China, promising to abolish their extraterritorial rights if China were to establish its legal systems along Western lines. A year later, the U.S. and Japan signed similar treaties with China. In particular, the treaties required the Chinese government to provide protection for foreign trademarks and establish offices to register trademarks.¹³ As noted by Alford (1995), “trademark protection was the centerpiece of the intellectual property issues addressed” in these commercial agreements.

The Qing central government, specifically, its Ministry of Commerce, responded by asking the Japanese government for help in designing a trademark law as a first step towards satisfying the conditions outlined in the treaties for abolishing ET. One difficulty was that often identical trademarks were registered by different owners in different countries, one usually being a counterfeit, and it was unclear how to decide between rival claimants (Morse, 1918). Japan suggested to use its first-to-file principle, which would continue to allow Japanese companies to counterfeit Western products as long as they filed the (counterfeit) trademark first, and at the same time prohibit Chinese merchants from copying Japanese products. Western officials and firms, led by the British, strongly opposed the plan. Due to their protests, the Qing government postponed putting the Provisional Code of Trademark Registration into force. As noted in the *Patent and Trade Mark Review* (1904), “local merchants being dissatisfied with the measure, the British and German Ministers protested and the enforcement of the regulations was indefinitely postponed.”

The British government then attempted to sign a mutual treaty with the Japanese government, which would enable British consuls and consular courts in China and Korea to punish Japanese firms that infringed on the intellectual property of British businesses. However, disagreements between the two governments on issues including the protection of British unregistered trademarks that had been in use in Chinese markets before 1894 ended the negotiations. For example, *Patent and Trade Mark Review* (1907) wrote that “China is being swamped with Japanese imitations, and there is no redress; England has signed with Russia, Germany, France and other powers agreements for the reciprocal protection of trade marks in China, but Japan is unwilling to become a party to these, desiring that China should first undertake the registration of trade marks. Since it is Japanese infringements and counterfeits

¹³See Article VII of the 1902 Treaty between the United Kingdom and China and Article IX of the 1903 Treaty between the United States and China.

that are feared and not Chinese, the justice of this position is not obvious.”

After the 1911 Xinhai Revolution, the new government decided to introduce its own regulations. The *Draft of Rules and Regulations of Trademark Registration* in April 1914, however, failed again to satisfy foreign diplomats.¹⁴ Negotiations for revising the draft were also postponed due to the outbreak of the First World War. The British’s continuing frustrations and concerns can be seen in the *North China Herald* on April 22, 1922, which highlighted an earlier article by Lord Northcliffe appearing in the *Daily Mail* warning the potential military threat Japan posed to China as well as its traders’ willingness to infringe trademarks. The third attempt to establish the trademark protection system in China with cooperation between British and Japanese governments ended again in failure.

2.3 China’s First Trademark Law of 1923

While the British and Japanese governments were negotiating over the draft of the Chinese trademark regulations, neither government anticipated the Chinese government to introduce a system for trademark protection on its own. After decades of failed negotiations, China saw the only way to progress with the trademark issue (and ultimately abolish ET) in confronting the conflicting parties with a *fait accompli*. The Chinese Congress passed the law and put it into force on May 9, 1923, and only then informed the foreign diplomats. Chinese opted to implement a compromise between the first-to-file (favored by the Japanese) and the first-to-use principle (favored by the British), in which the first-to-file principle would be adopted (after a certain notice period to the public) unless two firms applied for the same trademark, in which case the first-to-use principle would apply.

At first, the foreign governments and chambers of commerce fiercely opposed the law because of skepticism over the law’s effectiveness and concerns of losing extraterritorial rights. Even in March 1924, a telegraph was published on the front page of the *North China Herald* arguing that the trademark law threatened the interests of British trademark owners by “placing the responsibility for trademark adjudication in the hands of inexperienced Chinese courts.” However, the diplomats and businesses were soon overtaken by reality, as some groups such as Japanese businesses and German businesses who had previously lost ET sta-

¹⁴The British government was particularly disappointed to find no provisions for protecting old trademarks of British firms that had been used in China since 1842 as the draft did not adopt the first-to-use principle as requested by the British government. The objections were shared by the U.S., French and Russian governments. Even the Japanese government was unsatisfied with the draft.

tus started to register their trademarks, fearing that their rivals would register the trademarks first. It became evident then the implementation of the law had become irreversible. Between 1923 and 1926, 13,647 trademarks were registered with the Chinese trademark bureau (see Table 3 in Motono, 2011). While Japanese and German businesses accounted for the vast majority of the initial trademark applications as reported in the 1924 Trademark Gazette, by 1926 British firms owned the largest share of trademarks (32%) followed by Japan (20%), China (16%), Germany (15%), and the U.S. (12%). As can be seen in Figure 1, trademarks were most frequently registered in textiles (cotton textiles, clothing, woolen products, cotton yarns), chemicals (paints, medication, soap, cosmetics), and tobacco.¹⁵

2.4 A First Test: The Decline in Advertising against Infringements

The impact of the trademark law can be immediately seen on the advertisements of brand manufacturers. To address the problem of counterfeits in the absence of formal trademark protection, many brand producers turned to marketing campaigns and used advertising to warn consumers against brand imitations. The need for such a differentiation strategy and advertising effort should decrease upon the introduction of the trademark law.

To test this, we collected all advertisements printed in the *North China Herald*, the leading English newspaper in China at the time, and classified an advertisement as one against imitation if they included strings related to “imitation” in the ad.¹⁶ For example, the company “Lea & Perrins” warned their consumers: “To distinguish the original and genuine Worcestershire Sauce from the many imitations, see that the signature of LEA & PERRINS appears in *White* across the *Red* label on every bottle” – next to a picture of their product.¹⁷

Figure 2 shows that the share of advertisements that include a warning against trademark infringements in all advertisements declined sharply after 1923, from 6% before 1923 to virtually zero by 1925. This suggests that firms saw significantly less need after 1923 to warn their consumers about counterfeits, presumably because the trademark law was effective in deterring counterfeiting.

¹⁵The Nationalist government that came into power in 1927 kept the 1923 trademark law, but offered less effective protection for foreign businesses against Chinese counterfeiters. By 1934, 7,932 Chinese companies registered their trademarks in Shanghai, accounting for 86% of the registered trademarks in the country (Motono, 2013).

¹⁶Keywords like “imitation” were used in the search in the *North China Herald*. We manually checked the advertisements to make sure these advertisements did in fact warn against imitations.

¹⁷In an advertisement published in the *North China Herald* on July 31, 1920.

3 Trademark Protection and Firms: Mechanism and Data

To formally examine the economic effects of the trademark law, we digitized and assembled a rich array of micro-level datasets that provide unique insights on firm operations in one of the world's most competitive markets in the early 20th century. Before we describe the datasets, we first discuss the various mechanisms through which the trademark law could impact firm dynamics.

3.1 Mechanisms

The establishment of the trademark law, by granting a firm the exclusive rights to use a trademark, could affect firm and industry dynamics in several complex ways including reallocation, demand, and distribution.

Reallocation. Before the trademark law, both authentic and counterfeiting firms may be selling their products (potentially with heterogeneous qualities) under the same brand while consumers are unable to identify the true identity of the seller. The introduction of trademark protection, by ensuring authentic firms' exclusive rights to use a brand, would lead to a direct market reallocation within brand-specific market segments from counterfeiters to authentic producers, enabling the latter to grow and become more likely to survive. Because trademarks protect the rights to use a mark, rather than the rights to make or sell (sometimes similar) products with different marks, counterfeiters may either decide to exit the market or choose to obtain new marks for their varieties.

Demand. Next, by lowering the risk of consumers receiving counterfeits at the point of purchase, the trademark law reduces the information frictions consumers face in relating trademarks to the true identity of sellers. As Grossman and Shapiro (1988a) note, the reduced information frictions can increase consumers' confidence in the quality of purchased goods and hence willingness to pay for high-quality goods, further expanding the aggregate market demand for authentic firms. Grossman and Shapiro (1988a) also point out that this channel raises the value of authentic brands and enables firms to appropriate returns from their brands and reputation, thereby potentially increasing brand investment incentives.

Distribution. Further, the trademark law can affect authentic firms' mode of distribution. A significant literature has underscored the importance of intermediaries in facilitating the matching of buyers and sellers in the presence of search and information frictions (e.g., Ru-

binstein and Wolinsky, 1987, Biglaiser 1993, and Spulber 1996) and trade barriers (Ahn, Khandelwal and Wei, 2011; Antras and Costinot, 2011).¹⁸ However, working with intermediaries is associated with its own risks especially in the absence of strong legal institutions. The introduction of the trademark law could mitigate the risks and improve the confidence of authentic firms in working with domestic intermediaries, fostering new linkages both within and outside the boundary of the firm.

The above channels would lead to a range of implications for firm dynamics. First, both the reallocation and demand channels would increase the growth of authentic firms while counterfeiting firms contract in size. Second, while trademark protection help authentic producers capture brand-specific markets, it would not necessarily reduce market competition as often in the case of patent protection, with authentic firms becoming more likely to survive and some counterfeiters re-branding their products. Third, trademark protection, by protecting the value of brands as a firm-specific asset, may raise firms' incentives to invest in their brands. Finally, trademark protection would foster authentic firms' use of intermediaries and potentially the growth of the domestic intermediary sector.

To examine these hypotheses and quantify firm-level adjustments, we constructed a rich array of micro-level datasets, including a firm-employee panel dataset covering the universe of firms operating in Shanghai's concession areas spanning across 1870-1940 and a historical cross-country trademark database from 1870-1922.¹⁹

3.2 Firm-Employee and -Client Data in Shanghai's Concession Era

Often labeled as the "Paris of the East," Shanghai had emerged by 1930 as one of the largest cities in the world and the commercial center of East Asia with over 3 million inhabitants, vibrant manufacturing and service sectors, and remarkable openness to trade, investment, and immigrants (Osterhammel, 1989). The decades before the 1930s marked one of the most transformative as well as turbulent periods in Shanghai's history when Shanghai grew from an unknown fishing village to one of the most prominent industrial and financial centers around the world (Brandt, Ma, and Rawski, 2014).

¹⁸This was particularly the case in historical Shanghai where foreign firms often turned to domestic intermediaries due to language barriers and inland market restrictions. As a result, the intermediary sector accounted for more than half of the businesses as shown in Section 3.2.

¹⁹In section C.5 of the online appendix, we show additional analysis using product-level Chinese Customs import data from 1920-1928 to examine the trade effects of the law.

Between 1865 and 1930, trade passing through the port of Shanghai increased fourteen-fold and accounted for more than half of China’s foreign trade, which itself reached more than 2% of global trade flows, a level not regained until the 1990s (Lardy, 1994). By the 1930s, Shanghai also accounted for 67% of China’s inward FDI in manufacturing, while China’s total inbound FDI stock amounted to U.S. \$2.6 billion and 8.4% of the world’s total FDI—more than nearly any other underdeveloped region (Hou, 1965). Foreign businesses dominated the early stages of China’s modern industrialization, but Chinese entrepreneurs eventually grew to produce 73% of China’s factory output by 1933 (Rawski, 1989). During the rapid industrial growth, the population grew from 77,000 to 3.7 million, making Shanghai the world’s 7th largest city (Ma, 2008). Shanghai consisted of three areas: the International Settlement (or Public Concession), the French Concession, as well as the Chinese part of the city. The two concessions were governed by city councils independent of the Chinese government, and most foreign businesses were established in these areas.

We digitized and assembled an annual business-employee-level panel dataset covering the universe of firms operating in Shanghai’s concession areas spanning across 1872-1941 based on the *North-China Hong List*, a business and residential directory featuring comprehensive information about firms operating in the leading port cities of northern China.²⁰ This annual series was published by the *North-China Daily News*, an English-language newspaper based on Shanghai that was widely regarded as the “most influential foreign newspaper of its time.” The Hong Lists contain detailed information about all the firms operating in both the Public and the French concessions of Shanghai.²¹ For each company listed in the Hong List in a given year, we recorded, among other things, its name, address, products, and importer and exporter status. In addition, we digitized each firm’s non-production employees including their names, positions, and hierarchy levels within the firm. Figure E.2 in the online appendix shows an example page from the 1927 Hong list.

For each firm, we also identified its nationality using a number of different sources, including the “China Importers and Exporters Directory” published 1936 by the Bureau of Foreign Trade, Ministry of Industry, Shanghai, “The Universal Dictionary of Foreign Busi-

²⁰The Hong Lists from 1873, 1885, 1898, and 1900 are missing and not included in the dataset.

²¹In the international concession, the aggregate foreign employment in the Hong List at firms covers about 80% of the foreign male adult population reported by the census, which seems a reasonable coverage; see section C.1 of the online appendix for more details.

ness in Modern China”, a source that contains a detailed description of a firm’s ownership, history, and products; the “History of Foreign Firms”, published by the Shanghai Academy of Social Science in 1932; the “Shanghai Dollar Dictionary 1943”, published by the Dollar Dictionary Co.; and several documents from the Japanese Chamber of Commerce. For the remaining unmatched businesses, we manually searched them to identify sources with nationality information or assigned nationality based on the language of the firm name or the countries mentioned in the firm name (if unambiguous). Our measure of the nationality of a firm is time-invariant, as we do not have information about changes in the nationality of firms over time.

In addition, we collected comprehensive client information for each agent firm operating in Shanghai including the agent’s product composition, address, and nationality as well as the name and nationality of each client. The agent-client information allows us to measure firm linkages and how they evolved before and after the trademark law. We also downloaded all advertisements posted by firms in our sample in the leading daily Chinese newspaper Shen Bao (申报) during 1920-1926 to examine firms’ brand investment decisions.

Based on the data from each edition of the Hong List, we constructed a firm-level panel as well as a firm-employee-level panel dataset covering nearly the entire 1872-1941 period by matching firms over time. The richness of information from the Hong List and the corresponding panel that we generated offer us a unique tool for analyzing firm dynamics in one of the most volatile historical periods. The key firm-level variables in the datasets include:

- firm name: name of the firm in English, traditional Chinese, and Wade-Giles;
- year and address: the year of operation and address;
- firm activity: text description of firm activity matched to 8 broad industry categories (denoted by j in the empirical analysis below; these include: agriculture/mining, construction, manufacturing, transportation, wholesale, retail, finance/insurance/real estate, other services);
- products: description of specific products produced or sold by the firm, merged from the Appendix of the publications and subsequently matched to the NCL categories used in the trademark data as described below;
- nationality: the nationality of the firm assigned based on different separate sources as described above;

- list of non-production employees including names, titles and hierarchies; we are using a count of the firm's non-production employees as a measure of employment in the empirical analysis below;
- export and import status: an indicator of whether the firm was listed as an exporter, importer or both;
- hierarchical layers: a number that enumerates the indents in the list of employees that are used to denote hierarchical layers in Hong List;
- Chinese nationality of employees: a count of employees that have Chinese last names;²²
- job titles: we classify job titles into sales related positions (with job titles such as sales, salesman, marketing, representative, advertising, and publicity), engineering related positions (engineer, engineering, technical, machinery, draughtsman, mechanic, mechanician, and technician), and manufacturing related positions (job titles that include keywords like manufacturing, manufacturer, manufactory, production, producing, and factory);
- clients: the list of clients for each agent business in Shanghai including the name and nationality of the client;
- advertising: whether the firm posted an advertisement in the leading daily Chinese newspaper *Shen Bao* (申报) and the frequency of advertising.

Several stylized facts on the time trends and distributions of firms emerge from the data. Consistent with aggregate accounts, the data display a significant transformation in both the number and composition of businesses in Shanghai during the decades after late 1800s.

Figure 3 shows that the number of business grew rapidly starting in the 1920s and rose from 771 to 1,624 in 1920-1930 alone. The total employment recorded in our data also grew over time as shown in Figure 3, rising from about 5,000 in 1920 to 13,000 in 1930. Some particularly notable examples of foreign corporations include British American Tobacco (BAT), Standard Oil, and Mistui Trading Company. As shown in Figure 4, BAT, formerly named British Cigarettes and one of the Western companies involved in numerous trademark disputes, consisted of about 25 main employees and a relatively simple organization structure as of 1906; two decades later, BAT's operations in Shanghai expanded to over 100 main employees and 9 departments (such as accounting, advertising, legal and traffic).

²²We use a list of Chinese last names from <https://www.familyeducation.com/>.

There are also notable patterns in the industrial composition of Shanghai's economy. Throughout the historical period, wholesale constituted the most important sector in Shanghai's economy, accounting for 40-50% of businesses and employment. The dominant role of the wholesale sector led by domestic merchants and agents was driven by the major port status of Shanghai and the market barriers facing foreign manufacturers and merchants. Interestingly, during this period, Shanghai's economy also experienced a gradual growth of industrial activities, transitioning to a more diverse economic landscape with a mix of wholesale and manufacturing. As shown in Figure 5, the manufacturing sector grew from only 6.2% of the economy (measured in non-production employment) to 20% by 1930 as more foreign businesses set up factories in Shanghai.

The nationality composition of the businesses also varied significantly over time. Across country origins, Great Britain initially accounted for 50.5% of the businesses in the data as Figure 6 shows, but the share fell significantly over time reaching 20% by 1930 while the shares of Japanese and Chinese companies grew from 2.1% to 10.4% and from 3.3% to over 20%, respectively, by 1930. Other important firm nationalities in Shanghai were the United States, France, Germany, and Russia, which accounted for 18.3%, 5.7%, 4.7%, and 2.1% of the businesses, respectively, by 1930.

3.3 Cross-country Trademark Data

To measure firms' heterogeneous dependence on trademark protection, we obtain historical trademark data from the IP Portal of the World Intellectual Property Organization (WIPO). While WIPO in principle holds trademark data for 141 countries, after dropping countries with no or very sparse trademarks in the late 19th and early 20th century, we end up with trademark data for eight countries: Britain, Germany, U.S., Japan, Australia, Canada, Denmark and Spain.²³ The dataset lists the name of the trademark, the name of the trademark holder, the number of the trademark, the application date, and the product group(s) that the trademark is registered for. Product groups are defined according to the international *Nice classification (NCL)* scheme that was established by the Nice Agreement in 1957.²⁴

For each country, we calculate the cumulative sum of all trademarks registered between

²³We also dropped New Zealand whose product classification is inconsistent with the NCL system.

²⁴For details, see <https://www.wipo.int/classifications/nice/en/> (accessed 1/20/2021).

1872 and 1922, the year before the enactment of the trademark law.²⁵ We then aggregate the trademarks across the eight countries, yielding a total of 50,050 registered trademarks by 1922. For each NCL product category p , we then calculate its share in total trademarks, labelling this *trademarkintensity* _{p} .²⁶

As can be seen in Table 1, the product categories with the highest trademark intensity are pharmaceuticals, cosmetics, food, alcoholic beverages, chemical products, paper and cardboard, and tobacco. Services have a trademark intensity of zero, as it was not possible to register trademarks for them. Among the goods with the lowest trademark intensities were firearms, canvas, musical instruments, leather products or dressmakers' articles.

To compute a firm-specific measure of trademark intensity, We match the product-level trademark intensity to products sold by each firm prior to 1923 and use the maximum trademark intensity across the firm's products:

$$TrademarkIntensity_i := \max_{p \in P_i} (TrademarkIntensity_p)$$

where P_i denotes the set of products that the firm sold in the period 1920 to 1922, i.e., before the trademark law. The firm-specific trademark intensity enables us to explore cross-firm variations in demand for trademark protection and examine the heterogeneous effect of the trademark law at the firm level.

4 Empirical Evidence

In this section, we examine how Western, Japanese and Chinese firms, with their distinct roles in the trademark conflicts, had respectively adapted to the trademark law. We first examine how the trademark law had shaped the growth dynamics on the opposite sides of trademark conflicts through a combination of reallocation and demand mechanisms. Next we explore the effects of the trademark law on the linkages between foreign firms and domestic intermediaries and whether the linkages benefited the domestic sector.

²⁵Before 1872, only a handful of trademarks were reported on Jan 1, 1801, and hence excluded in our data.

²⁶Registration of trademarks for services was not possible in this time period. Nevertheless, some service trademarks appeared in the data. We drop these trademarks and use a measure of 0 trademarks for all services that appear in the Hong List data.

4.1 Empirical Specification

To examine the firm effects of the trademark law, we estimate a difference-in-differences specification on the sample of pre-existing firms in Shanghai (i.e., firms that we observe in at least one of the years 1920-1922), comparing the outcome of firms that sell trademark-intensive products with firms that sell less trademark-intensive products before and after the trademark law of 1923:

$$y_{ict} = \beta_0 + \beta_1 * TrademarkInt_i * PostLaw_t + FE_i + FE_{ct} + FE_{jt} + \epsilon_{ict} \quad (1)$$

where y_{ict} is a firm-specific outcome such as the log employment for a given firm i from country c in year t , $TrademarkInt_i$ is a firm-specific measure of trademark intensity based on the firm's product composition in 1920-1922 and each product's trademark intensity (calculated based on a group of countries outside of China as discussed in Section 3), $PostLaw_t$ is a dummy that equals 1 if the year is equal to or after 1923, FE_i denote firm fixed effects, FE_{ct} denote country-year specific fixed effects that are included to absorb potential macroeconomic shocks from the home countries of the firms, and FE_{jt} denote broad industry-year specific fixed effects that are included to account for structural change across broad sectors in Shanghai. Standard errors are two-way clustered by product category and country-year. In our baseline regressions, we center on the period of 1920-1926 to compare firm outcomes in a focused time window and mitigate the effects of other historical shocks, such as the establishment of the Nationalist government. Table D.1 in the online appendix presents the summary statistics for this regression sample.

In order for our identification strategy to work, it is important to make sure that trademark intensive firms would not have grown even in the absence of the trademark law, i.e., there are no pre-trends. To ensure that, we also implement an event study specification:

$$y_{ict} = \beta_0 + \sum_{t=1920}^{1926} \beta_t * TrademarkInt_i + FE_i + FE_{ct} + FE_{jt} + \epsilon_{ict} \quad (2)$$

Examining the elasticity of trademark intensity before and after 1923 will help detect the presence of pre-trends in our data.

4.2 Authentic vs. Counterfeiting Firms

We start by examining how the trademark law had shaped firm growth dynamics depending on the firms' role in trademark conflicts. As discussed in Section 3.1, as the main complainants of trademark infringements, Western firms are expected to benefit, at both intensive and extensive margins, from reallocation within its own market segment and increased aggregate demand due to lower information frictions. They are also expected to raise brand investments as trademark protection raises the value of brands. Japanese and to a less extent Chinese firms, which had been accused of counterfeiting, are expected to contract in size, but may opt to re-brand their products and adapt their product composition to remain in the market. In this subsection, we present evidence on these hypotheses by looking at firm adaptations in employment, extensive margins, and brand investment.

4.2.1 *Within-Firm Employment Growth*

In Table 2, we show that the trademark law exerted a net positive effect on the growth of trademark-intensive Western firms. Based on column (3), our preferred specification that includes broad industry times year fixed effects, the employment of Western firms with mean trademark intensity grew by 4.6% after the enactment of the law. This implies on average adding a 1/2 employee at the mean employment of 11.2. However, for firms selling the ten most trademark-intensive products listed in Table 1, the employment growth ranged from 7.8% to 19.2% (adding 1-2 employees to the mean firm size). In contrast, firms selling the ten least trademark-intensive products listed in Table 1 saw only a 1.3-3.5% employment growth.²⁷

In contrast to the growth of Western firms, trademark-intensive Japanese firms experienced a significant contraction in their employment after 1923. In terms of magnitude, the employment of Japanese firms with mean trademark intensity decreased by 15% after the enactment of the law. The effect on Chinese firms is also negative, but has a smaller magnitude and mostly statistically insignificant.²⁸ In section C.6 of the Online Appendix we show

²⁷As we show in Figure E.3 of the online appendix, the effect of the trademark law was not uniform across the size distribution of firms with the effects concentrated on large and medium-sized businesses.

²⁸In section C.5 of the Online Appendix, we show that these effects were also mirrored in Chinese imports. The trademark law led to increased Chinese imports and new trade relationships from Western countries in trademark intensive products. In contrast, imports from Japan fell, though the effect is not statistically significant.

that these effects are robust to different ways of measuring trademark intensity.

To ensure the results are not driven by pre-trends, we estimate equation (2) for the three types of firms. As shown in Figure 7, no pre-trends are present for Western firms: the estimated employment elasticities of trademark intensity before 1923 are not significantly different from zero, while the effect partially appears in 1923 and then fully in 1924 and after. Figure 8 shows the corresponding event study for Chinese and Japanese firms, confirming the absence of pre-trends and the negative effect of the trademark law.²⁹ Overall, these results suggest that after years of Anglo-Japanese trademark conflicts, the enactment of China's first trademark law enabled Western firms to grow their trademark-intensive operations in China while disadvantaging Japanese and Chinese businesses.

Next we examine whether the positive effect of the trademark law on Western firm employment indeed reflects firms' varying dependence on trademark protection rather than other firm or product attributes. While we are not aware of other major shocks in China during 1923, we want to ensure that we are measuring the effect of the trademark law on firms that are *ex ante* most dependent on trademark protection, i.e., the trademark-intensive firms. To check this, we interact the post-law dummy with other firm or product specific characteristics. For example, firms in trademark-intensive products may also be innovation intensive. For this reason, we control for an interaction of the post-law dummy with a firm-specific measure of patent intensity in column (2) of Table 3. We calculate patent intensity for each product as the share of patents in each product category based on data on the stock of U.S. patents in 1922 from the historical U.S.PTO database.³⁰ Trademark and patent intensity are found to be only weakly correlated, and our employment effects are not explained by patent intensity.

In columns (3)-(5) of Table 3 we check whether the estimated effect on trademark-intensive industries may instead reflect an effect on large industries or firms, as the trademark law may be particularly relevant for large (or small) industries and firms. To test this, we interact the post law dummy with the number of firms or the total employment of firms

²⁹We group Chinese and Japanese firms together in the event study, as the event study for Japanese firms is noisier as we do not have as many Japanese firms in the sample. We report the event study for Japanese firms in Figure E.6 of the online appendix; it still shows a decline in employment, but is noisy.

³⁰See <https://www.uspto.gov/learning-and-resources/electronic-data-products/historical-patent-data-files>. Similar to trademark intensity, we use the maximum patent intensity across products for each firm.

in each NCL product category and firm initial size, respectively.³¹ Again, none of these size measures explain away the employment effects of trademark intensity. Finally, we show in column (6) the estimated effects are also not due to general macroeconomic shocks in home countries that had affected trademark-intensive firms differentially.^{32, 33}

One would assume that trademark protection is more important for sellers of final goods than sellers of intermediate inputs, as the former sell to consumers that may be more easily deceived than firms due to the lack of expertise or limited interactions with retailers. In Figure 9 we estimate heterogeneous effects by splitting the NCL product categories into predominantly intermediate versus final goods. In line with this hypothesis, we see that the reallocation from Japanese and Chinese firms to Western firms after the trademark law is only present for final goods. In contrast, the effects on intermediate inputs is insignificantly different from zero for firms from all country groups.

After establishing the effect on firm employment growth, we next explore in more detail how firms grew or shrank their organizations in response to the trademark law by taking advantage of information on the job titles of employees. As we do not have job titles for all firms in our sample, column (1) of Table 4 first repeats our baseline analysis on this sub sample to confirm that the trademark law has the same employment effect on this sample. In columns (2) to (4) we examine specific positions in firms and their decisions to employ a lawyer, sales staff, and engineer, respectively. We see that after the trademark law, Western firms were more likely to employ all of these positions, but the effect is only statistically significant for engineers. While only suggestive, this could indicate that Western firms that entered the Chinese market by importing goods produced in their home countries became

³¹We use the number of unique firms that offer the product in at least one of the years between 1920 and 1922. In order to create a firm-specific measure, we again use the maximum size across all products a firm produces.

³²Note that we already control for general macro-economic shocks in the home countries by including country-year specific fixed effects; here we are allowing these shocks to affect firms differentially.

³³In the online appendix, we conduct a different set of robustness checks and test whether excluding potential interest groups, namely, specific countries, products, or firms that were expected to benefit particularly from the trademark law would affect our results. These groups include, for example, German firms, who lost extraterritoriality at the end of World War I and as a result would arguably have more interests in a domestic trademark law in China, and firms in the tobacco industry (or the largest tobacco manufacturer), who were particularly affected by trademark infringements. The analysis in section C.3 shows that excluding these potential interest groups does not affect our estimated effect of the trademark law on Western firm growth. Furthermore, we show in the online appendix in section C.4 that neither a specific country nor a specific product group is driving the results.

more likely to start their own manufacturing activities after the trademark law — a trend that was also visible in the aggregate statistics of Shanghai in Figure 5. For Japanese and Chinese firms, the employment reduction is reflected in less hiring for most positions, but particularly pronounced for sales staff.

4.2.2 Entry, Exit, and Product Composition

Up to now we have studied the intensive margin, i.e., whether the trademark law affected the growth of existing firms. Next we examine the extensive margins of growth by extending the sample from firms that had existed in 1920-1922 to all firms that appeared between 1920 and 1926. We fully balance the sample between 1920-1926 and define an entry dummy as 1 in and after the year a firm entered, and an exit dummy variable as 1 in and after the year a firm exited. This allows us to examine how the law affected the entry and exit rates of firms. In columns (1) and (2) of Table 5 we see that while the trademark law had an insignificant effect on the entry of Western firms, it exerted a negative and significant effect on the exits of Western firms. Overall, in column (3) we see that the trademark law led to a positive but insignificant effect on firm existence, suggesting that the trademark law protected incumbent firms while not necessarily leading to increased entry.

The trademark law could also affect firms' product composition, especially the likelihood of adding and dropping trademark-intensive products. To examine this hypothesis, in columns (4) and (5) of Table 5 we return to the sample of firms that existed in 1920-1922 and create a dummy variable to denote firms that added or dropped a trademark-intensive product in a given year.³⁴ The results are similar to the firm entry and exit analysis, suggesting that Western firms were significantly less likely to drop products with above-median trademark intensity after 1923, but not more likely to add them.

Turning to the extensive margin for Japanese and Chinese firms, we see that Japanese were less likely to enter while Chinese firms were less likely to exit. In addition, Japanese firms were significantly more likely to add trademark-intensive products whereas there were no significant changes in the product portfolio of Chinese firms.

³⁴Trademark-intensive products here are defined as products with above median trademark intensity.

4.2.3 Brand Investment

If the trademark law helped incumbent Western firms to grow their trademark-intensive products, we may also see increased investment incentives in, for example, brand promotion, as Western firms experienced a larger return from this after the trademark law. Prior to the trademark law, the return from advertising faced a free-rider problem: any increase in market demand through brand promotion efforts would be shared by counterfeiters. This externality lowers brand producers' incentives to invest in advertising. The free-rider problem would be mitigated after the enactment of the trademark law; with reduced counterfeits in the market, brand producers would have greater motives to pay for brand promotion. At the same time, however, the need of advertising the brand to educate consumers and ensure they are able to distinguish the authentic brand from counterfeits may also decrease with strengthened trademark protection, leading to an ambiguous net effect on advertising investments.

In order to check which of the two effects dominates in the data, we downloaded all advertisements posted by firms in our sample in the leading daily Chinese newspaper *Shen Bao* (申报) during 1920-1926. Column (1) of Table 6 reports that while the increase in the likelihood of advertising was not statistically significant for Western firms, the number of advertising days in columns (2) and (3), alternatively measured as $\log(\text{ads}+1)$ or the inverse hyperbolic sine of ads, rose significantly after 1923 for Western businesses. Interestingly, we also find a higher probability to post advertisements for Japanese firms. This result offers suggestive evidence that Japanese firms reacted to the trademark law by trying to build up their own brands and invest in brand promotion.³⁵

4.3 Domestic Intermediaries

Next, we examine how the trademark law affected Western firms' incentives to work with intermediaries, both within and outside the boundary of the firm. As discussed in Section 3.1, the establishment of the trademark law, by reducing the risks of using domestic intermediaries as a mode of distribution, would provide foreign authentic firms greater incentives to collaborate with domestic employees and agents.

We start by considering the use of Chinese employees within Western firms by construct-

³⁵In section C.7 of the online appendix, we check whether trademark protection may have exerted an effect on product quality by studying whether there had been changes in advertisements focusing on product quality. We do not find a significant effect.

ing several variables to capture Chinese employees' position in Western firm hierarchy. First, we separately identify Chinese employees from foreign employees based on the names of the employees reported in the Hong List. Second, we explore the position of Chinese employees in the organizational hierarchy by exploiting the indents in the employee directory as reported in the Hong List, where lower-level employees were separated from their superiors by an indent. More specifically, we check whether Chinese employees appeared in the first organizational layer, which we label as the managerial layer, and also calculate the average position of Chinese employees in a Western company's employment hierarchy. Finally, we check whether Chinese employees appeared in positions related to sales (i.e., job titles related to sales, marketing, and advertising), engineering (i.e., job titles related to engineering positions), and manufacturing (i.e., job titles related to production).

Table 7 reports the results. We find Western firms with trademark-intensive products expanded their employment after the trademark law by hiring Chinese employees (columns 2 and 3). Chinese employees were also more likely to appear in the managerial layer (column 4), and in general move up in the organizational hierarchy (column 5; a negative sign means a higher layer, as the layers are numbered from 1 (highest) to 3 (lowest)). With respect to positions, Chinese employees were more likely to be hired in sales related positions, as opposed to engineering or production related positions (columns 6-8). These results suggest that Western businesses became more inclined to promote Chinese employees after the enactment of the trademark law, especially with respect to managerial and sales tasks. In contrast, Chinese firms were less likely to hire Chinese managers (column 4) and Chinese employees higher up in the organizational hierarchy (column 5). Japanese firms reduced their employment by both reducing foreign (column 2) and Chinese employees (column 3), and were also less likely to employ Chinese in more important positions (columns 4 and 5), though not statistically significantly so.

Apart from setting up a foreign-owned subsidiary in a treaty port like Shanghai, a common alternative strategy to enter the Chinese market was through agents located in China. However, before the trademark law Western firms may have found it risky to use Chinese agents with the concern that Chinese merchants might mix their branded products with counterfeits, thereby undermining the brand value (Motono, 2011). We test whether Western companies became more likely to enter the Chinese market via Chinese agents after the trademark law by exploiting the list of clients that agents provided in the Hong List. In Table

8 we find that Chinese firms selling trademark-intensive products were more likely to act as agents for foreign firms after the trademark law, and that their number of clients increased significantly. In contrast, Western and Japanese firms did not experience significant changes in their numbers of clients.

This suggests that there may be heterogeneity in the effect of the trademark law on Chinese firms: those that acted as agents for foreign firms grew, while others shrank. We check this in Table 9 by estimating whether Chinese agents, merchants, or manufacturers experienced similar growth (many firms were present in more than one broad industry so the categorization is not exclusive). Indeed we see that Chinese firms that acted as agents for Western firms exhibited strong growth, rather than contraction. Chinese manufacturers also grew, while the negative effect is mostly based on other, for example retail, businesses.

4.4 Aggregate Industry-level Effects

After exploring detailed firm-level responses to the trademark law across sides of trademark conflicts, we next examine one of the long-standing concerns of IP institutional reforms—the implications of greater protection for market competition.

To do so, we aggregate the data to the product-year level to explore the net effect of the trademark law on industry employment and market competition in Table 10. Since many firms offer several products, in columns (1) and (2) of Table 10 we allocate total firm employment to the product with the maximum trademark intensity, while in columns (3) and (4) we distribute firm employment equally across products. Columns (1) and (3) show positive effects at the intensive margin: the total industry employment increased by 7 percent at the mean level of trademark intensity and more than doubled for relatively more trademark-intensive products. Columns (2) and (4) show even stronger effects at the extensive margin: firms start to enter new, especially trademark-intensive, product categories. This is also reflected in columns (5) and (6), which use the number of firms in a product category as outcomes, and column (7), which uses a dummy variable indicating whether any firm offers a specific product. The trademark law led to not only more firms in trademark-intensive product categories, but also more products with active firms.³⁶

³⁶It is worth noting that the increase in the number of firms in a given product category does not reflect re-branding of counterfeiting firms, because the data accounted for both authentic and counterfeiting firms present in each product category before and after the trademark law. Instead, the result reflects a combination of reduced exits and new entry as shown in Section 4.2.2.

The above results suggest that the impact of the trademark law went beyond a simple reallocation between authentic and counterfeiting firms and did not reduce overall market competition. Instead, the law entailed an expansion in the number of varieties and products offered. This finding, in line with the earlier firm-level results in Section 4.2.2, highlights again the distinct role of trademark protection: in contrast to the common concerns that greater IP protection would increase market power, trademark protection may instead increase the number of branded varieties.³⁷

5 Comparing Alternative Institutional Attempts

As discussed in Section 2, the 1923 trademark law was preceded by a series of alternative institutional models exploited by foreign powers to address trademark issues. These include extraterritoriality leading to the direct imports of foreign legal institutions in China, bilateral commercial treaties with specific trademark provisions, and a subsequent legal trademark code in 1904 that had never been put into force. Our long time horizon in the data enables us to compare the effect of the 1923 trademark law to the effects of these alternative approaches and attempts.

In this section, we construct three additional variables to represent each of these approaches and attempts. First, we construct a firm-year specific measure of extraterritorial rights based on the firm's nationality and the nation's extraterritorial status in a given year. Due to geopolitical reasons such as the start and end of World War I that were arguably orthogonal to Chinese economy, certain countries were added and deleted from the list of nations that enjoyed extraterritorial status.³⁸ These changes in extraterritorial power caused firm-specific changes in their legal institutional settings. In legal disputes, when the defendants' home countries had extraterritorial status, the home-country law of the defendants would apply and the cases would be tried at their consular courts. However, differences in countries' legal systems such as the filing principles of the trademark law and the lack of strong domestic enforcement could lead to unresolved disputes and jurisdiction evasion.

³⁷This result is echoed in our ongoing study that seeks to quantify the effect of the 1923 trademark law on consumer welfare using detailed brand-level price series and trademark registrations and a model of information frictions and counterfeiting. The evidence shows that Western brands did not increase prices after the trademark law; instead, brand prices exhibited a slight decline after trademark registrations.

³⁸The countries that lost extraterritorial status were: Australia (1901), Austria (1917), Czechoslovakia (1917), Germany (1917), Finland (1924), Hungary (1917), Latvia (1924), Philippines (1898), Russia (1917). The countries that gained extraterritorial status were: Switzerland (1918), Japan (1896).

Second, we use a dummy variable to denote the commercial treaties China signed with Great Britain, United States, and Japan in 1902 and 1903, respectively. The bilateral commercial treaties, requiring China to establish its own legal trademark system among other demands, again exhibited conflicting interests with both Western nations such as Great Britain and Japan attempting to export their respective trademark laws.

Finally, we include a dummy variable to denote China's first attempt after the 1902-1903 bilateral treaties to establish a domestic trademark code in 1904. The code, largely influenced by Japan's trademark system, was eventually not enforced due to protests from Western governments.

The estimation results that evaluate and compare the effects of all three alternative institutions with the 1923 trademark law are reported in Table 11 where each institutional measure is interacted with firm-specific trademark intensity.³⁹ The results in column (6) show that when taking into account all measures and controlling for country-year dummies, neither extraterritoriality nor bilateral treaty exerted significant, positive effects on firm employment. The unenforced 1904 trademark code, as anticipated, was also found to have no effects. Across all the alternatives, the 1923 trademark law was the only measure shown to have played a positive role in the growth of trademark-intensive firms. These findings suggest that earlier attempts involving direct imports of foreign institutions had been largely unsuccessful as means of trademark protection and a positive growth effect was not achieved until the establishment of a domestic trademark institution.

6 Conclusion

In this paper, we investigate how firms on different sides of trademark conflicts adapt to trademark protection by exploiting a historical precedent — the introduction of China's first trademark law of 1923 — and a series of newly digitized micro-level datasets in Shanghai, one of the world's most contested markets in trademark disputes.

Our empirical evidence shows that the trademark law exerted sharply different and complex effects on Western, Japanese and Chinese firms who had played distinct roles in the trademark conflicts. The trademark law spurred growth and brand investment for trademark

³⁹The appendix to the Hong List that lists which firms offer which type of product or service is only available during 1920-1930. In order to understand which products and services firms offer across the entire period of 1872-1936, we manually assign products to firms based on the textual description of the activity of the firm in the Hong List.

intensive Western firms. In contrast, Japanese businesses, who had frequently been accused of counterfeiting, experienced employment contractions while attempting to build their own brands after the law. Further, the trademark law led to new linkages with domestic intermediaries both within and outside the boundary of Western firms as they became more inclined to recruit and promote Chinese employees as well as work with Chinese agents. The Chinese intermediaries then experienced a significant growth in both the volume of foreign clients and employment.

At the aggregate level, in contrast to the widespread concern over reduced market competition after IP reforms, we show that the trademark law led to a net growth in both total employment and product variety in trademark-intensive industries. These findings highlight the prospect of enforcing trademark protection and addressing consumer information frictions while fostering domestic sectors and competition, underlining the potential gains from domestic trademark institutions.

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A Figures

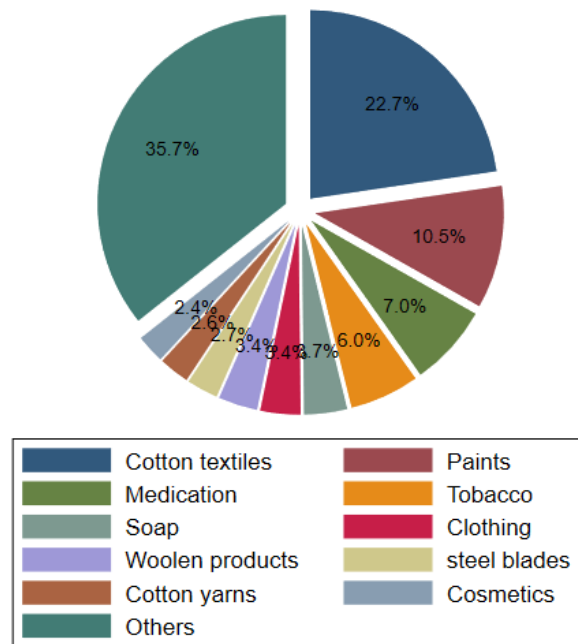


Figure 1: Most common product categories, Chinese trademark registries 1924-1927

Notes: We computed these statistics based on our own digitization of all issues of the Chinese trademark registries called *Shangbiao Gongbao* (商标公报) between January 1924 and 1927.

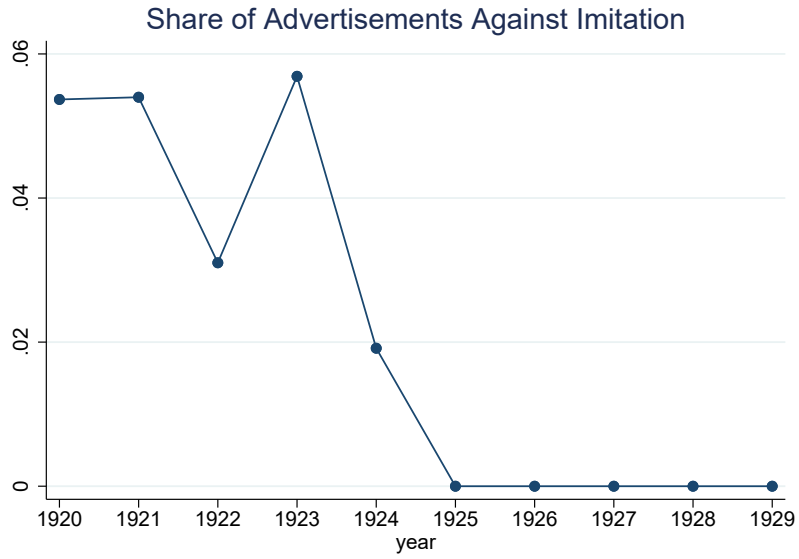


Figure 2: Share of Advertisements against Trademark Infringements in North China Herald

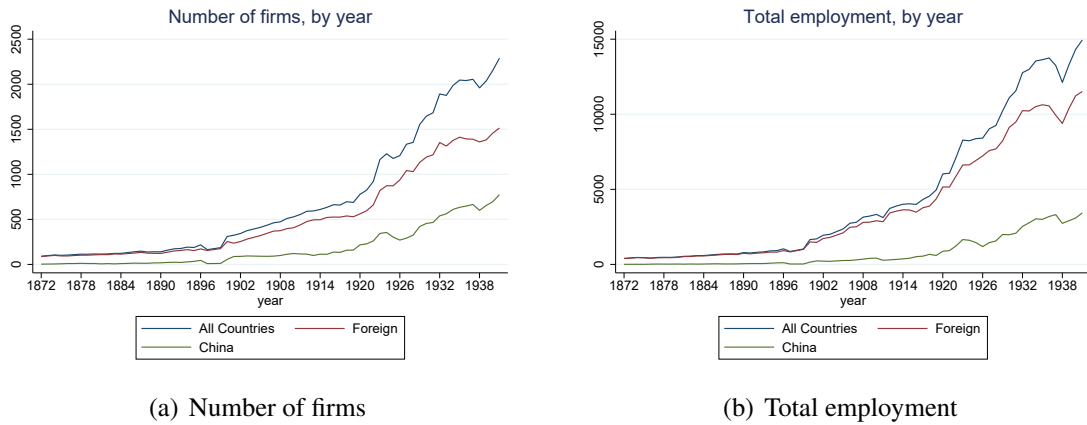


Figure 3: Time Trends of Firms and Employment in Shanghai Concessions

British Cigarette Co., Ltd.
(Late The American Cigarette Co., Ltd.)
Factory: Pootung.
Office: No. 9A, Nanjing Rd.
Directors:
Keily, H. A.,
Chairman and Manager.
Kempffer, E., *Secretary.*
Anderson, L.
Thomas, J. A.
Cunliffe Owen, H. Von R.,
Non Resident.
Harris, W. R.,
Assistant Managers:
Millard, P. H.
Tower, F. W.
Stechler, Wm. A.
Superintendents:
Fausler, G. J.
Gregory, R. H.
Tennison, R. H.
Bishop, A. J.
Office Staff:
Watanabe, T.
Manning, F. R.
Yamashita, A.
Evans, E. B.
Ferrer, J. B.
Cameron, Jas. D. M.
Djigmanese, B.
Schmitt, Ferd
Lawton, L. B.
Tuchlinski, P.
Endaya, B.
Xavier, Francisco

烟美華註商英
司公限有公
Ying-shang-shih-ahm-ying-mei
yan-kung-see-yu-ahm-ying-mei
Head Office: 9 Southview Rd.
Dist. 2488
Tel Add: Poverhattan
British-American Tobacco Co. (China), Ltd.
Directors:
Cunliffe-Owen, Sir Hugo,
Chairman.
Bailey, Robert
Baasell, A.
Casson, L. G.
Dickson, A. L.
Fairley, V. L. A.
Gosford, The Earl of
Henslowe, A. T.
Morris, Wm.
Macintosh, Brig. Gen.
E. H., C.B.E., D.S.O.
Millard, P. H.
Parkinson, H. E.
Ridgeway, F. E.
Wolffler, C. F.
Yenson, C. G., A.C.L.S., sec.
McKerrie, R., *asst. sec.*
Legal Dept.—
Dickson, A. L.,
legal adviser
Prime, D. W. M., *asst.*
McKerrie, R.,
legal adviser
Fairley, Miss E. B.
Arnold, Miss D.
Robinson, Miss G. M.
Accounting Dept.—
Foster, W. G., *acct.*
McKenzie, S. F.,
sub-acct.
Barnes, D. J.
Bask, Miss I.
Boyle, C. J.
Booth, O.
Berry, Miss E. I.
Booth, F.
Britto, J. C.
Brookdale, G. E.
Covech, A. H.
Dillon, Mrs. F. Y.
Dillon, Mrs. C. N.
Emanation, R. T.
Eysaah, E.
Farrar, F. M.
Farrer, J. B.
Giberson, A.
Gosleg, L. M.
Hall, F.
Harris, C. E.
Harrington, Mrs. M.
Hooper, E. T.
Hyndman, F. S.
Jack, Mrs. A. E.
Langley, H.
Laurillan, Miss E. M.
McKinnon, A. S.
Moore, H.
Nelson, Mrs. M.
O'Brien, B.
Preston, Mrs. J.
Rachurs, V. J.
Rappanick, A. G.
Reidman, H. G.
Ramsello, F. M. *asst.*
Ridgway, Miss A. H.
Roberts, F. G.
Rome, Miss I.
Rome, Miss J.
Rowley, J. H.
Shaw, Mrs. H.
Sullivan, C. A.

B. A. T. Co.—cont.
Smith, H. J. P.
Steinthal, Miss D. A.
Sykes, C. F.
Thompson, E. P.
Wells, W. E.
Whitcomb, H. E.
Wilcox, Miss E. C.
Worthy, G.
Advertising Dept.—
Banger, W. S.
Barrett, E. G.
Block, R. F.
Cass, W. H.
Gimes, G.
Haines, Miss J. K.
Hillam, H. C.
Klein, A. Z.
Parsell, W. A.
Pattiss, A. V.
Seaborn, Miss M.
Snyder, O. W.
Eastern Division—
Dwelling, J. C.
Stafford Smith, F.
Exchange Dept.—
Pascoia, C. S.
General—
Barker, G. S.
Basson, M.
Boeman, Mrs. S.
Coleman, Miss J.
Dillon, R. P.
Engelst, W. W., *asst.*
Gaskin, J. L., *asst.*
Hargrave, Mrs. H. H.
Lanochowsky, Miss V.
Lanser, F.
Marshall, Mrs. A. M.
McIntosh, Miss J. M.
McKenzie, Miss I. D.
Thang, Miss H. E. L.
Pascos, Miss G.
Pascos, Miss M.
Robinson, Miss A. M.
Sullivan, Mrs. E.
Tanner, Mrs. E. F.
Insurance Dept.—
Keech, O. C.
Motor Finance Dept.—
Janosa, W. H.
Janosa, E. H.
Buckstone, W.
Chongpattana, Miss M.
Herzberg, M.
Jensen, J. V.
Krauskopf, G. T.
Lautzoff, F. T.
Nabonshoff, A.
Oshkoff, A.
Pogelsky, E.
Purto, A.
Shaw, Miss L.
Votich, Miss M.
Teleg. Dept.—
Thomas, H.
Solomon, H. H.
Blinks, A. R.
Anderson, H. T.
Sapiotis, T.
Browning, F.
Cameron, W. G.
Dunn, Miss M. B.
Dorfsh, O.
Fitzman, C.
Goldenberg, W.
Henderson, J.
Henderson, G.
Johnson, W.
Lester, R.
Lundberg, E. M.
Maher, F.
Mott, J.
O'Neill, T. C.

SMOKE CAPSTAN!

Left: BAT-Shanghai in 1906; Right: BAT-Shanghai in 1926

Figure 4: Employment of British American Tobacco in 1906 versus 1926

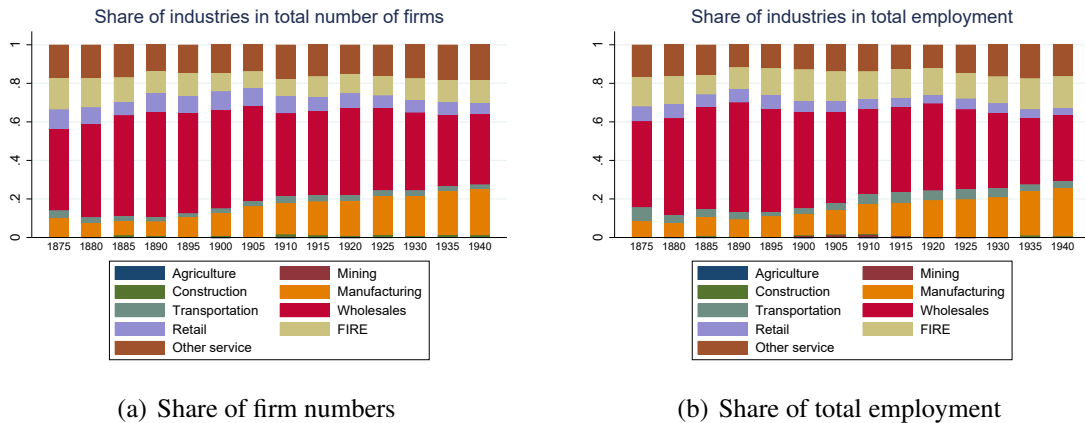


Figure 5: Industry Composition of Businesses in Shanghai's Concessions

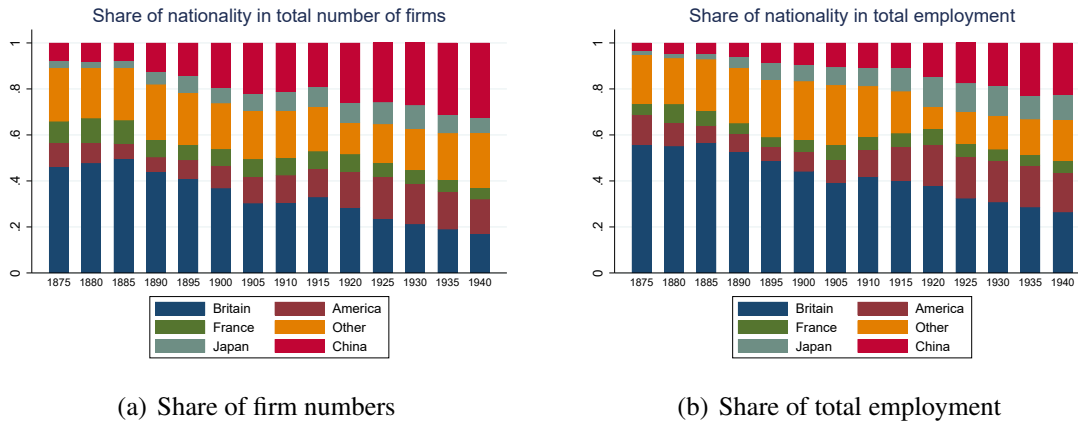


Figure 6: Nationality Composition of Businesses in Shanghai's Concessions

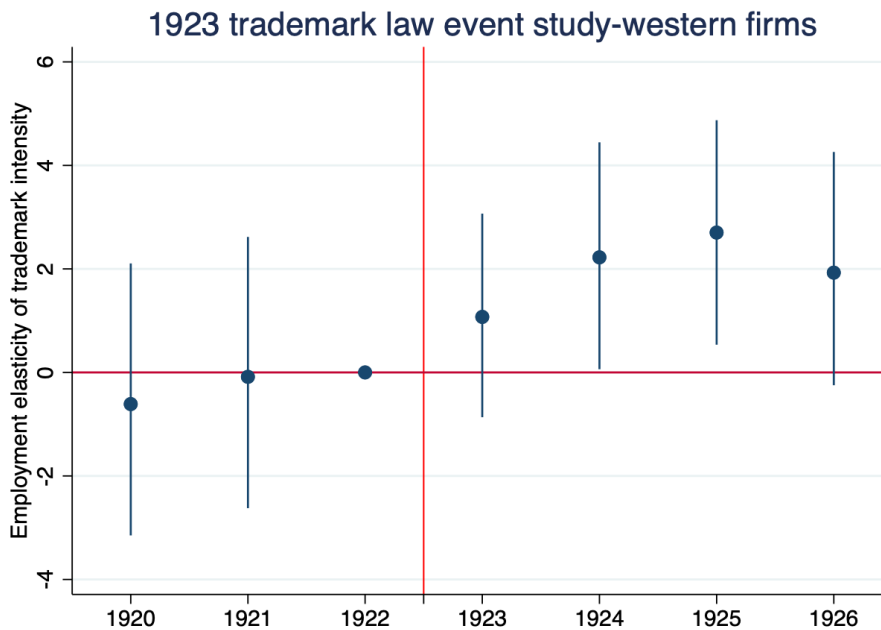


Figure 7: The Effect of Trademark Law on Western Firm Employment: Event Study

Notes: The graph is produced by estimating regression (2) for Western firms. Confidence intervals are computed using wild cluster bootstrap with clusters at the product category and country-year (Roodman, Ørregaard Nielsen, MacKinnon, and Webb, 2019).

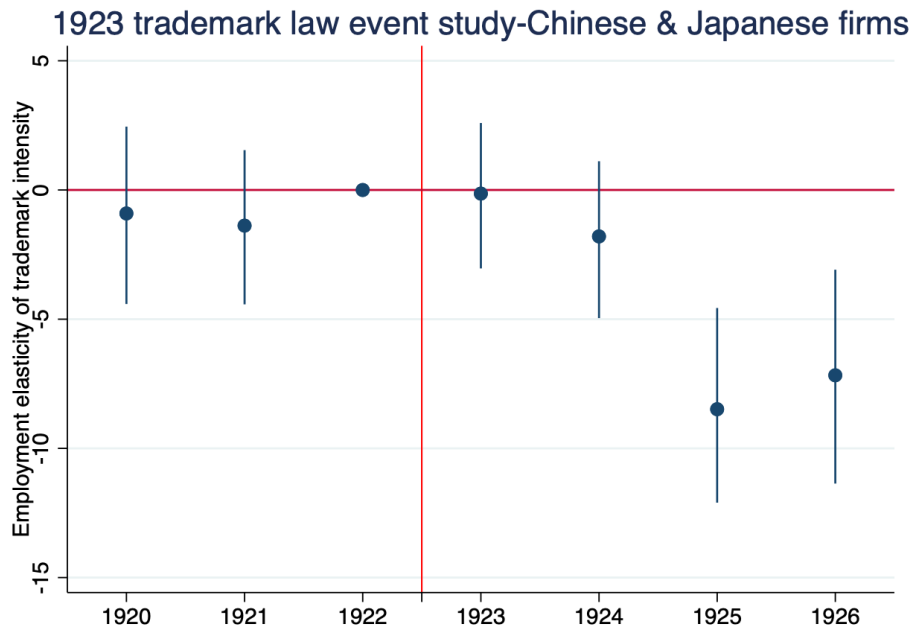


Figure 8: The Effect of the Trademark Law on Chinese and Japanese Firm Employment: Event Study

Notes: The graph is produced by estimating regression (2) for Chinese and Japanese firms. Confidence intervals are computed using wild cluster bootstrap with clusters at the product category and country-year (Roodman et al., 2019).

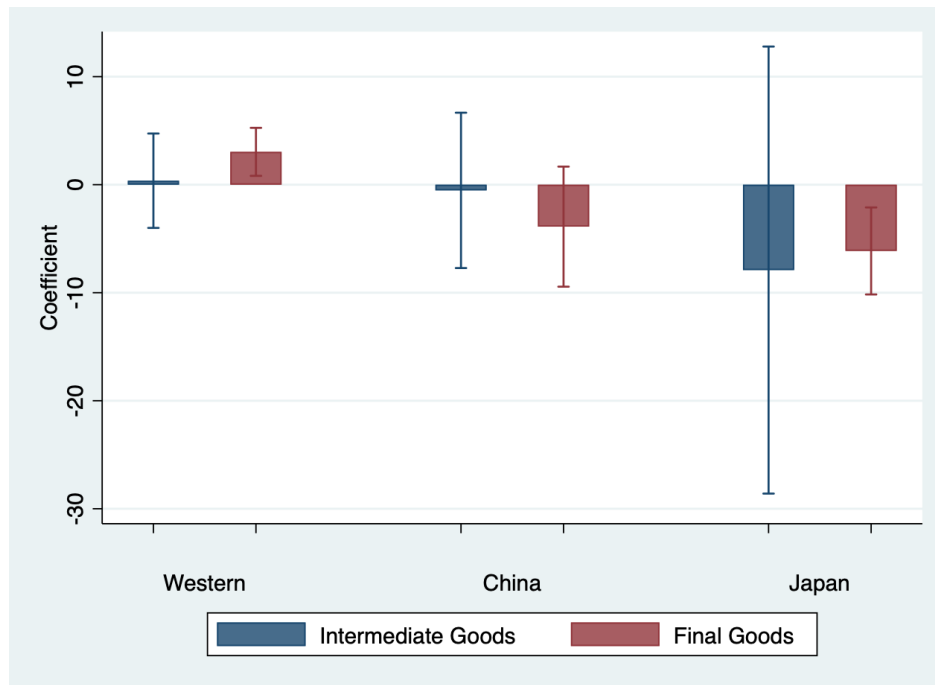


Figure 9: Effect of the Trademark Law on Employment — intermediate versus final products

Notes: The effects are estimated from an extended version of regression (1), where we add interaction terms for intermediate and final goods depending on the NCL product classification of the product with the largest trademark intensity a firm sells. We also add all the main effects, i.e., we allow final goods to be more affected after the trademark law for Western, Chinese or Japanese firms.



Figure 10: The Effect of the Trademark Law on Price: Event Study

Notes: The graph is produced based on the method and R program described in Callaway and Sant'Anna (2020). Blue bars represent log prices after trademarks are registered, red bars represent the months before trademark registration. Time on the x-axis is in months.

B Tables

Table 1: Trademark intensity across product categories

NCL product category	Trademark int.	NCL product category	Trademark int.
Pharmaceuticals	0.088	Fabrics and fabric covers	0.016
Non-medicated cosmetics and toiletry	0.076	Toys, games, sports equipment	0.016
Foodstuffs of plant origin	0.073	Precious metals, jewellery, clocks, watches	0.013
Foodstuffs of animal origin	0.048	Medical equipment	0.013
Alcoholic beverages	0.047	Furniture	0.013
Chemical products	0.046	Natural or synthetic yarns	0.012
Paper, cardboard and office goods	0.045	Dressmakers' articles	0.012
Tobacco	0.041	Leather and leather goods	0.010
Non-alcoholic beverages; beer	0.040	Musical instruments	0.008
Machines, motors and engines	0.036	Canvas and other materials	0.008
Hand-operated tools	0.035	Firearms	0.006
Paints and colorants	0.034	Scientific and technological services	0
Scient. instruments and audio equip.	0.034	Food and drink services	0
Metals	0.031	Telecommunications services	0
Clothing, footwear and headwear	0.030	Transport; packaging and storage of goods	0
Industrial oils and fuels	0.029	Legal, security, and personal services	0
Small, hand-operated utensils	0.026	Medical and veterinary services	0
Live animals and plants	0.024	Construction services; mining and drilling	0
Environmental apparatus	0.024	Business services	0
Vehicles	0.021	Treatment and recycling	0
Electrical, thermal, acoustic insulating materials	0.021	Insurance, financial and real estate services	0
Materials, not of metal	0.018	Education, entertainment, sports	0

Notes: Trademark intensity is measured using each product's share in total pre-1923 trademarks recorded at the historical trademark database from the World Intellectual Property Organization (WIPO) IP Portal.

Table 2: The Effect of the Trademark Law on Firm Employment Growth

	(1)	(2)	(3)	(4)
	ln(empl)	ln(empl)	ln(empl)	ln(empl)
Post 1923 * trademark intensity				
– Western	1.408*	1.748**	2.177**	2.223**
	(0.821)	(0.774)	(1.058)	(1.063)
– Chinese Firms	-1.842	-1.814	-3.096	-3.960*
	(1.655)	(1.678)	(2.395)	(2.251)
– Japanese Firms	-0.401	-0.071	-6.849***	-8.897***
	(2.112)	(2.599)	(1.840)	(2.338)
Observations	3,180	3,144	3,006	4,472
R-squared	0.906	0.908	0.913	0.890
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes			
Ctry*Year FE		Yes	Yes	Yes
Ind*Year FE			Yes	Yes
Sample until	1926	1926	1926	1930

Notes: This table compares the effects of the trademark law on the employment of Western, Japanese and Chinese firms. The sample includes Western, Japanese and Chinese firms located in Shanghai's concessions with employment and activity information between 1920-1926. The dependent variable is the natural log of a firm's employment in a given year between 1920-1926. Post trademark law is a dummy denoting the period after the establishment of the trademark law in 1923. Trademark intensity is a firm-specific measure of trademark dependence based on each firm's pre-1923 product mix and product-level trademark intensity calculated using each product's share in total pre-1923 trademarks. Column (1) includes interactions of the China dummy with a post-1923 dummy, as well as the interaction of the Japan dummy with the post-1923 dummy (coefficients not shown). Standard errors clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Controlling for Alternative Product and Country Attributes

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(empl)	ln(empl)	ln(empl)	ln(empl)	ln(empl)	ln(empl)
Post 1923 * trademark intensity						
– Western Firms	2.177**	2.068*	2.234**	2.254**	1.698*	2.953***
	(1.058)	(1.056)	(1.058)	(1.083)	(0.956)	(1.006)
– Chinese Firms	-3.096	-3.100	-3.037	-3.041	-2.556	-3.011
	(2.395)	(2.314)	(2.391)	(2.398)	(2.155)	(2.380)
– Japanese Firms	-6.849***	-7.201***	-6.254***	-6.282***	-7.310***	-6.311***
	(1.840)	(2.282)	(1.883)	(1.832)	(2.139)	(1.857)
Post 1923 * patent intensity						
– Western Firms		0.429				
		(0.564)				
– Chinese Firms		0.469				
		(0.426)				
– Japanese Firms		-0.957				
		(2.045)				
Post 1923 * ln(number of firms)						
– Western Firms			0.008			
			(0.015)			
– Chinese Firms			0.016			
			(0.034)			
– Japanese Firms			0.053			
			(0.065)			
Post 1923 * ln(total employment)						
– Western Firms				0.007		
				(0.010)		
– Chinese Firms				0.011		
				(0.031)		
– Japanese Firms				0.041		
				(0.050)		
Post 1923 * ln(average employment 20-22)						
– Western Firms					-0.089***	
					(0.023)	
– Chinese Firms					-0.075*	
					(0.040)	
– Japanese Firms					0.082	
					(0.112)	
Trademark intensity * ln(real GDP)						
						-5.552
						(5.206)
Observations	3,006	3,006	3,006	3,006	3,006	3,006
R-squared	0.913	0.913	0.913	0.913	0.914	0.913

Notes: This table reports the estimated effect of the 1923 trademark law on Western firms' employment when controlling for other product or industry attributes. The dependent variable is the natural log of a firm's employment in a given year. Post trademark law is a dummy denoting the period after the establishment of the trademark law in 1923. Trademark intensity is a firm-specific measure of trademark dependence based on each firm's pre-1923 product mix and product-level trademark intensity calculated using each product's share in total pre-1923 trademarks. Patent intensity is a similar firm-specific measure based on each firm's pre-1923 product mix and product-level patent intensity, calculated using each product's share in total pre-1923 patents. Number of firms and total employment are the number of firms and the total number of employees, respectively, in a product category. "ln(real GDP)" is the real GDP of the home country of the firm from the *Maddison Project Database*, interpolating data for missing years, see Bolt, Inklaar, de Jong, and van Zanden (2018) and Fouquin and Hugot (2016). All regressions include firm, industry-year, and country-year fixed effects. Standard errors two-way clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: How did Firms Grow or Shrink? The Effect of the Trademark Law on the Probability of Hiring in Certain Positions

	(1)	(2)	(3)	(4)
	ln(empl)	Dummy if firm has:		
		Lawyers	Sales staff	Engineers
Post 1923 * trademark intensity				
– Western Firms	3.566** (1.326)	0.913 (0.573)	0.453 (1.179)	0.732* (0.394)
– Chinese Firms	-4.974 (3.086)	0.429 (0.642)	-1.495 (1.120)	-0.173 (0.198)
– Japanese Firms	-12.439*** (3.424)	-0.065 (2.178)	-4.779** (2.049)	-0.396 (1.988)
Observations	2,344	2,344	2,344	2,344
R-squared	0.913	0.824	0.709	0.785

Notes: All regressions include firm, country-times-year, and industry-times-year fixed effects. Standard errors two-way clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Entry, Exit and Product Composition

	(1)	(2)	(3)	(4)	(5)
	Extensive margin			Product scope	
	Firm entry	Firm exit	Firm exist	Adding tm-int product	Dropping tm-int product
Post 1923 * trademark intensity					
– Western Firms	-0.282 (0.648)	-0.797** (0.321)	0.515 (0.771)	-0.621 (0.715)	-0.717** (0.268)
– Chinese Firms	-0.345 (0.746)	-1.423** (0.596)	1.077 (0.853)	-0.585 (0.641)	-0.093 (0.344)
– Japanese Firms	-1.594* (0.893)	0.035 (0.728)	-1.629 (1.345)	2.334*** (0.189)	-3.193 (2.538)
Observations	7,652	7,652	7,652	2,782	2,782
R-squared	0.667	0.572	0.556	0.318	0.342

All regressions include firm, country-times-year, and industry-times-year fixed effects. Standard errors two-way clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Advertising Investments

	(1)	(2)	(3)
	Advertising dummy	ln(advertising days+1)	$\sinh^{-1}(\text{advertising})$
Post 1923 * trademark intensity			
– Western Firms	0.542 (0.877)	3.316* (1.887)	3.366* (1.950)
– Chinese Firms	-0.300 (0.578)	0.641 (2.137)	0.567 (2.221)
– Japanese Firms	3.464** (1.457)	3.060 (2.013)	3.680 (2.260)
Observations	3,098	3,098	3,098
R-squared	0.695	0.809	0.805

Notes: This table reports the estimated effects of the trademark law on the advertising of Western firms on Shen Bao. The sample includes Western firms located in Shanghai's concessions with employment and activity information between 1920-1926. The dependent variables are the dummy of having advertisements on Shen Bao in a specific year, logged numbers of advertising days of advertisements, and the inverse sine of advertising days of advertisements, respectively. Trademark law is a dummy denoting the trademark law established in 1923. Trademark intensity is a firm-specific measure of trademark dependence based on each firm's pre-1923 product mix and product-level trademark intensity calculated using each product's share in total pre-1923 trademarks. All regressions include firm, country-times-year, and industry-times-year fixed effects. Standard errors two-way clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Domestic Integration within the Boundary of Firms

	(1)	(2)	(3)	(4) Hierarchy		(6)	(7) Job titles		(8)
	ln(empl)	ln(foreign empl)	Dummy Chinese empl	Dummy Chinese mgr	Avg layer of Chinese empl	Dummy Chinese sales staff	Dummy Chinese engineers	Dummy Chinese manuf staff	
Post 1923 * trademark int.									
– Western Firms	2.177** (1.058)	1.646 (1.033)	1.995** (0.789)	0.719*** (0.201)	-0.818*** (0.279)	0.130** (0.062)	-0.690 (0.535)	-0.386 (0.437)	
– Chinese Firms	-3.096 (2.395)	-1.538 (1.416)	-0.024 (0.195)	-0.503*** (0.034)	0.206*** (0.062)	-1.075 (1.039)	-0.129 (0.221)	0.912*** (0.256)	
– Japanese Firms	-6.849*** (1.840)	-9.394*** (3.031)	-1.998 (2.323)	-1.468 (0.871)	2.853 (2.022)	0.043 (0.052)	0.000 (0.000)	0.000 (0.000)	
Observations	3,006	3,006	3,006	3,006	1,607	2,344	2,344	2,344	
R-squared	0.913	0.948	0.809	0.656	0.593	0.741	0.751	0.387	

Notes: This table reports the estimated effects of the trademark law on the organization of firms. The sample includes firms located in Shanghai's concessions with employment and activity information between 1920-1926. The dependent variables are the number of layers in a firm's management hierarchy and Chinese employees' average rank/layer in the management hierarchy, respectively. Trademark law is a dummy denoting the trademark law established in 1923. Trademark intensity is a firm-specific measure of trademark dependence based on each firm's pre-1923 product mix and product-level trademark intensity calculated using each product's share in total pre-1923 trademarks. Regressors are post 1923 * trademark intensity interacted with dummies for Western, Chinese or Japanese firms, respectively. All regressions include firm, country-times-year, and industry-times-year fixed effects. Standard errors two-way clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: The Client Growth of Chinese Intermediary Firms

	(1)	(2)
	Dummy having clients	ln(num clients+1)
Post 1923 * trademark intensity		
– Western Firms	-0.247 (0.631)	-1.858 (2.279)
– Chinese Firms	1.606*** (0.459)	2.672*** (0.593)
– Japanese Firms	-0.036 (0.823)	-3.601 (2.559)
Observations	3,006	3,006
R-squared	0.770	0.783

Notes: The number of clients counts the list of firms for which Shanghai firms act as agents. All regressions include firm, country-times-year, and industry-times-year fixed effects. Standard errors two-way clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: The Employment Growth of Chinese Intermediary Firms

	(1)	(2)	(3)	(4)
	ln(empl)	ln(empl)	ln(empl)	ln(empl)
Post 1923*trademark intensity	-3.657 (2.415)	-5.057 (3.222)	-4.052* (1.926)	-7.865** (2.653)
Post 1923*trademark intensity*agent	14.855* (7.197)			16.137* (7.884)
Post 1923*trademark intensity*merchant		4.756 (2.968)		4.597 (3.251)
Post 1923*trademark intensity*manuf			1.884 (1.635)	4.498* (2.127)
Observations	868	868	868	868
R-squared	0.881	0.881	0.880	0.882

Notes: Sample includes all Chinese firms. All regressions include firm, country-times-year, and industry-times-year fixed effects. Standard errors two-way clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: The Effects of the Trademark Law on Aggregate Employment and Competition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ln(empl)	ln(empl + 1)	ln(empl)	ln(empl + 1)	ln(firms)	ln(firms + 1)	Firm dummy
Post 1923*trademark intensity	3.564* (1.904)	9.315*** (3.269)	1.589 (1.384)	8.642** (3.902)	0.076 (1.739)	5.920* (3.179)	2.279* (1.175)
Observations	548	1,274	575	1,274	582	1,274	1,274
R-squared	0.848	0.757	0.875	0.739	0.904	0.745	0.626

Notes: In columns (1) and (2), firm-level employment of multi-product firms is allocated to the product with highest trademark intensity. In columns (3) and (4), firm-level employment of multi-product firms is distributed across all products equally. Firm dummy is 1 if the product-year has at least one firm for which the product has the highest trademark intensity, and 0 otherwise. All regressions include product and year fixed effects. Standard errors are clustered at the product level. *** p<0.01, ** p<0.05, * p<0.1.

Table 11: Comparing Alternative Institutions

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(empl)	ln(empl)	ln(empl)	ln(empl)	ln(empl)	ln(empl)
Part I: ET						
ET	0.063 (0.092)	0.137 (0.134)	0.185 (0.143)	0.185 (0.143)	0.130 (0.152)	
ET*trademark intensity		-2.383 (2.651)	-3.532 (2.719)	-3.533 (2.714)	-2.137 (3.110)	-4.475 (3.825)
Part II: Bilateral Treaties						
Treaty			-0.295* (0.147)	-0.295* (0.147)	-0.286* (0.149)	
Post 1904*trademark intensity			-7.271*** (2.551)	-7.134*** (1.575)	-6.988*** (1.558)	-9.373*** (2.555)
Treaty*trademark intensity			3.549 (3.043)	3.548 (3.041)	3.209 (3.076)	5.636 (4.446)
Part III: Provisional Trademark Code						
(Post 1906)*trademark intensity				-0.145 (2.317)	-1.421 (2.214)	-1.323 (2.538)
Part IV: 1923 Trademark Law						
(Post 1923)*trademark intensity					3.581** (1.336)	3.929*** (1.451)
Observations	20,051	20,051	20,051	20,051	20,051	19,797
R-squared	0.765	0.765	0.766	0.766	0.767	0.777
Country-year controls	Yes	Yes	Yes	Yes	Yes	No

Notes: This table compares the effect of the trademark law with earlier institutions including extraterritoriality, bilateral treaties, and the 1904 trademark code. The sample includes Western firms located in Shanghai's concessions with employment and activity information appearing between 1872-1936. The dependent variable is the natural log of a firm's employment in a given year. ET is a firm specific dummy denoting a firm's status of extraterritoriality in a given year. Treaties is a country-year specific dummy denoting the treaties between China and Great Britain, the U.S. and Japan, respectively. 1904 trademark code is a dummy denoting a trademark code proposed in 1904 but not enforced. Trademark law is a dummy denoting the trademark law established in 1923. Trademark intensity is a firm-specific measure of trademark dependence based on each firm's product mix as described in the activity text of the Hong List of each year and product-level trademark intensity calculated using each product's share in total pre-1923 trademarks. Controls are: dummy variables indicating the 'equal treaties' that China entered with Germany and Austria in the 1920s, ln(GDP/capita), ln(population). All regressions include firm, country-times-year, and industry-times-year fixed effects. Standard errors two-way clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

ONLINE APPENDIX

C Additional Analysis

C.1 Data validation: Hong List

To cross check the coverage of the data of the Hong List, we compare the aggregate non-production foreign employment of foreign firms with the size of the foreign population (including both adults and children) in Shanghai reported in the Census. The comparison suggests that the employees in our data accounted for 26% to 41% of foreign population in Shanghai, see Figure E.1a) in the online appendix. For the international concession, the census reports population separately for male adults, female adults, and children. Figure E.1b) shows that the aggregate (predominantly male) employment in the Hong List covers about 80% of the foreign male adult population of the census in the international concession, which we believe is a plausible ratio.

C.2 Restricting the Analysis to Goods Only

In our main paper, firms in both goods and services sectors are included in the analysis. In this subsection, we examine the robustness of the results when restricting the analysis to goods only. Note that as many of the firms in our sample sell both goods and services, this analysis drops firms that sell only services.

The results are reported in Table D.3. We find that the estimated effect of the trademark law to increase in magnitude when considering goods only, and are statistically significant in most specifications.

C.3 Excluding Potential Interest Groups

We also conduct a different set of robustness checks and test whether excluding certain interest groups, namely, specific countries, products, or firms that were expected to benefit particularly from the trademark law, would affect our estimated effects of the trademark law on Western firm growth. The analysis is reported in Table D.2.

For example, German firms lost extraterritoriality at the end of World War I and as a result would arguably have more interests in a domestic trademark law in China. We drop German firms in column (2) and find the results remain unaffected. Relatedly, among the different products, cigarettes were a product that was particularly affected by trademark infringements.¹ At the same time, the cigarette industry was heavily concentrated, with *British American Tobacco (BAT)* being one of the big players. Big business groups could in principle have been lobbying for the introduction of the trademark law, thereby potentially violating the exogeneity assumption. While this seems unlikely given the historical context described in Section 2.3, we drop BAT in column (3) and the entire tobacco industry in column (4). The analysis shows that this does not affect our estimated effect of the trademark law, either.

¹This is highlighted in Motonu (2011), and also reflected in the data on advertisements that we describe in Section 2.3.

C.4 Dropping a Country or Product

Next, we examine whether the estimated growth effects of the trademark law are due to a particular country or product. In Figures E.4 and E.5 below, we show that neither a specific country nor a specific product group is driving the results. The results are very similar in magnitude and mostly significant when we drop a country or product group at a time.

C.5 The Effect of the Trademark Law on Chinese Imports

In addition to firm growth, we would expect the trademark law to similarly affect China's imports of trademark-intensive products.

To investigate this, we compile bilateral product-level import data between China and the world for the period of 1920 to 1928.² The source for the import data is the annual series "Foreign Trade of China" published by the *Statistical Department of the Inspectorate General of Customs*. For each source country and year, the data report the quantity and value of Chinese imports in a given product.

We harmonize countries and products over time, resulting in data for 40 countries and 246 harmonized product categories and covering all years between 1920 and 1928. Harmonizing products over time is challenging, as the product classification system changed significantly in 1925. We harmonize products based on the description of product categories, and verify our matches using the publication in 1925 that also provided import data for the previous years 1924 and 1923 under the new classification. Overall, we are able to match 91% of trade data in terms of imports value in 1924 either exactly over time (35%) or closely (56%) with deviations of less than 1% of trade value in either product classification in both 1923 and 1924).³ In our analysis we focus on the products that we can exactly match over time, and show robustness checks that include the remaining product categories.

In order to examine this, we use bilateral product-specific import data and estimate the following equation:

$$\ln(\text{imports}_{pct}) = \beta_0 + \beta_1 * \text{TrademarkInt}_p * \text{PostLaw}_t + FE_{pc} + FE_{ct} + \epsilon_{pct} \quad (3)$$

where imports_{pct} are China's import values in product category p from country c in year t , TrademarkInt_p is the trademark share of product p as defined in the previous section, PostLaw_t is a dummy that equals 1 if the year is equal to or after 1923, FE_{pc} are product-country specific fixed effect, and FE_{ct} are country-year specific fixed effects. As different product categories can be of different size, we use the average import value between 1920-1922 of the product category in each country as weights in the regression. We cluster standard errors by product category p , in line with Bertrand, Duflo, and Mullainathan (2004). We run the regression on the sample of all countries except Japan, as we will study Japan separately further below. We also drop rice from the products, as rice imports were unusually

²We are grateful to Robert Bickers, Hans van den Ven, and their team for sharing with us their digitized data covering a large share of the final trade dataset.

³As sometimes errors in the trade data from previous years are updated in later publications, it is not entirely clear whether mismatches are due to mistakes in product assignment, or correction of previous mistakes in the official trade data.

low in 1919 and 1920 due to poor harvests leading to rice shortages in all of Southeast Asia (Kratoska, 1990).⁴

Table D.4 presents the results. Column (1) shows that the imports of trademark-intensive products increased significantly after the establishment of the trademark law. Column (2) shows that the result is very similar when using country-year fixed effects instead of year specific fixed effects, our preferred specification. The magnitude of the effect is sizeable: imports in the most trademark-intensive products in the trade data (i.e., tea and coffee with a trademark intensity of 0.073) increased by 1.2%, while imports in the product category with mean trademark-intensity (i.e., chinaware with a trademark intensity of 0.026) increased by 0.4% after the trademark law.

Columns (1) and (2) of Table D.4 explore the effect of the trademark law on the intensive margin of imports by using log of imports as the dependent variable, which by definition excludes observations with zero trade (70% of observations). In columns (3) to (5) we explore the inclusion of the extensive margin in a variety of ways. Column (3) uses log (imports + 1) as the dependent variable, and column (4) uses the inverse hyperbolic sine transformation of imports. The effect of the trademark law remains positive and significant when including the extensive margin. Column (5) uses the simple import dummy and confirms that the trademark law also led to the establishment of new trade relationships in trademark-intensive products.

As with the firm data, in order for our identification strategy to work, it is important to make sure that there are no pre-trends indicating imports of trademark-intensive goods might have grown even in the absence of the trademark law. To check for this, we estimate a full event study version of equation (3) by estimating:

$$\ln(imports_{pct}) = \beta_0 + \sum_{t=1920}^{1928} \beta_t * TrademarkInt_p + FE_{pc} + FE_{ct} + \epsilon_{pct} \quad (4)$$

Figure E.7 shows the estimation results. Again, there is no evidence of pre-trends: the coefficients before 1923 are by an order of magnitude smaller and insignificantly different from zero, while coefficients after 1923 are consistently large, and mostly significantly different from zero. There, however, appears to be a slight decline in the effect of the trademark law over time.

Next we consider the effect of the trademark law on Chinese imports from Japan. If a large share of China's imports from Japan were counterfeits, we should expect the trademark law to have a smaller effect on imports from Japan. In Table D.4 the results confirm what we have seen in the analysis of employment growth; imports from Japan fell, though the effect is not significant. The full event study for Japan is reported in Figure E.8; while the event study is noisier than the one for Western imports in general, it does not find imports to grow after the trademark law.

⁴The recovery of rice imports from the rice crisis appeared as a pre-trend in our data, which would overestimate our effect.

C.6 Robustness to Alternative Measures of Trademark Intensity

In Table D.5 we use alternative measures of trademark intensity. We begin by normalizing trademark intensity by the size of the industry in column (2). In Table 3 we have already shown that our results are robust to controlling for the size of the respective industry in Shanghai, but the size of the industry in Shanghai may not be the size of the industry in the foreign countries for which we have trademark data. We were able to obtain detailed employment data per industry that enabled us to match employment to NCL product categories for the U.S., so in column (2) we divide U.S. trademark intensity by the size of a product group as measured by total employment in this product group in the U.S..⁵ While this rescales the trademark intensity variable using employment, our results are robust to this alternative measure. In column (3) we return to our baseline measure of trademark shares, but we take out Japan's trademark intensity from the aggregate measure, and assign it to Japan only. I.e., Western countries and China get assigned the trademark intensity of all countries excluding Japan, and Japan gets assigned the trademark intensity of Japan. In column (4) we go one step further and use the trademark intensity of each firm's home country (and the aggregate measure if we do not have trademark registration data for a given country) rather than the aggregate trademark share as in our baseline specification. While these measures may be susceptible to endogeneity concerns and are therefore not our preferred measure, the results are robust.

C.7 The Effect of the Trademark Law on Quality Ads

The previous literature has also suggested that trademark protection may exert mixed effects on product quality. On the one hand, firms may improve product quality as they capture a larger market share, charge potentially higher prices, and/or experience larger demand for their products as consumers become less concerned about receiving counterfeits. On the other hand, authentic producers may have more incentives to offer a higher quality without trademark protection, in order to make it harder for counterfeiters to copy their products.

We explore these hypotheses using information available in the advertisement data. Specifically, we classify a subset of advertisements as “quality ads”, if the text of the advertisements stresses the quality of the product, using words such as 质 (quality), 特效 (effective), 功效 (efficacy), 功用 (effect). In columns (1) to (3) of Table D.6 we find an insignificant increase in firms' advertising highlighting product quality.

⁵We are grateful to Dave Donaldson, James Lee, and Rick Hornbeck for sharing the digitized census data with us. The U.S. was the only country for which we were able to get employment data for very detailed industries that enabled us to match them to NCL product categories. Notice, however, that the U.S. manufacturing census does not include the service sector. The normalized trademark intensity is therefore not defined for the service sector, which explains the reduced sample size.

D Online Appendix — Tables

Table D.1: Summary Statistics

	(1)	(2)	(3)	(4)	(5)
	Observations	Mean	Std.dev.	Min	Max
Employee number	3220	10.215	20.864	1	387
Share of Chinese employees	3220	0.298	0.382	0	1
Number of products	3220	1.635	1.222	1	11
Trademark intensity	3220	0.022	0.024	0	0.088
Western firm dummy	3220	0.64	0.48	0	1
Chinese firm dummy	3220	0.279	0.449	0	1
Japanese firm dummy	3220	0.081	0.272	0	1

Notes: Summary statistics are provided for the sample used in the baseline regression, column (1) of Table 2 (the regression drops some singletons).

Table D.2: Excluding Potential Interest Groups

	(1)	(2)	(3)	(4)
	ln(empl)	ln(empl)	ln(empl)	ln(empl)
Post 1923*trademark intensity	2.177** (1.048)	2.209** (1.049)	2.167** (1.056)	2.352** (1.085)
Observations	1,898	1,884	1,891	1,828
R-squared	0.913	0.913	0.910	0.911
Firm FE	Yes	Yes	Yes	Yes
Ind*Year & Ctry*Year	Yes	Yes	Yes	Yes
Excluding	No	German	BAT	Tobacco

Notes: This table reports the estimated effect of the 1923 trademark law on Western firms' employment when excluding certain potential interest groups. The sample includes Western firms located in Shanghai's concessions with employment and activity information between 1920-1926. The dependent variable is the natural log of a firm's employment in a given year. Post trademark law is a dummy denoting the period after the establishment of the trademark law in 1923. Trademark intensity is a firm-specific measure of trademark dependence based on each firm's pre-1923 product mix and product-level trademark intensity calculated using each product's share in total pre-1923 trademarks. Column (1) includes the baseline sample and columns (2)-(4) exclude German firms, British American Tobacco, and all firms that sell or produce tobacco products, respectively. Standard errors two-way clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

Table D.3: The Effect of the 1923 Trademark Law on Employment of Western Firms: Goods only

	(1)	(2)	(3)	(4)
	ln(empl)	ln(empl)	ln(empl)	ln(empl)
Post 1923*trademark intensity	2.531** (1.079)	2.423* (1.265)	2.489 (1.543)	2.550* (1.378)
Observations	855	842	808	1,209
R-squared	0.905	0.912	0.909	0.896
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes			
Ctry*Year FE		Yes	Yes	Yes
Ind*Year FE			Yes	Yes
Sample until	1926	1926	1926	1930

Notes: The trademark intensity measure used in this table only considers products but not services of firms. Firms that only sell services are therefore dropped. Standard errors are clustered by product category. *** p<0.01, ** p<0.05, * p<0.1.

Table D.4: Trademark Law and Import Growth — Western Countries versus Japan

VARIABLES	(1)	(2)	(3)	(4)
	ln(imports)	ln(imports+1)	$\sinh^{-1}(\text{imports})$	Import dummy
Trademark intensity * (Post \geq 1923) * All countries excl. Japan	16.263** (7.415)	22.591** (9.194)	23.029** (9.337)	0.637** (0.290)
Trademark intensity * (Post \geq 1923) * Japan	-2.433 (11.321)	-7.967 (12.705)	-8.299 (12.896)	-0.476 (0.517)
Observations	11,071	14,958	14,958	14,958
R-squared	0.906	0.863	0.858	0.583
Country-year FEs	yes	yes	yes	yes
Country-prod FEs	yes	yes	yes	yes

Notes: This table reports the estimated effects of the trademark law on China's imports, separately from all countries excluding Japan and from Japan. The sample includes products that can be matched exactly across different product classification schemes over time and excludes rice. The dependent variables are the natural log of the import value, the natural log of the import value plus 1, the inverse sine of the import value, and a dummy for the existence of imports, respectively. Post law is a dummy denoting the period after the establishment of the trademark law in 1923. Trademark intensity is a product-level trademark intensity calculated using each product's share in total pre-1923 trademarks. All regressions are weighted by the import value of the respective product in the country averaged over 1920-1922. Standard errors are clustered by product category. *** p<0.01, ** p<0.05, * p<0.1.

Table D.5: Robustness to Alternative Measures of Trademark Intensity

	(1)	(2)	(3)	(4)
	ln(empl)	ln(empl)	ln(empl)	ln(empl)
Post 1923 * trademark intensity				
– Western	2.177**			
	(1.058)			
– Chinese Firms	-3.096			
	(2.395)			
– Japanese Firms	-6.849***			
	(1.840)			
Post 1923*normalized U.S. trademark share				
– Western		13.877**		
		(6.014)		
– Chinese Firms		-24.185**		
		(11.305)		
– Japanese Firms		15.779		
		(21.359)		
Post 1923 * trademark share excl. Japan				
– Western Firms			2.310**	
			(1.041)	
– Chinese Firms			-2.826	
			(2.365)	
– Japanese Firms			-3.432***	
			(0.148)	
Post 1923 * country specific trademark share				
– Western Firms				1.717*
				(0.944)
– Chinese Firms				-2.826
				(2.365)
– Japanese Firms				-3.432***
				(0.148)
Observations	3,006	2,037	3,006	3,006
R-squared	0.913	0.912	0.913	0.913

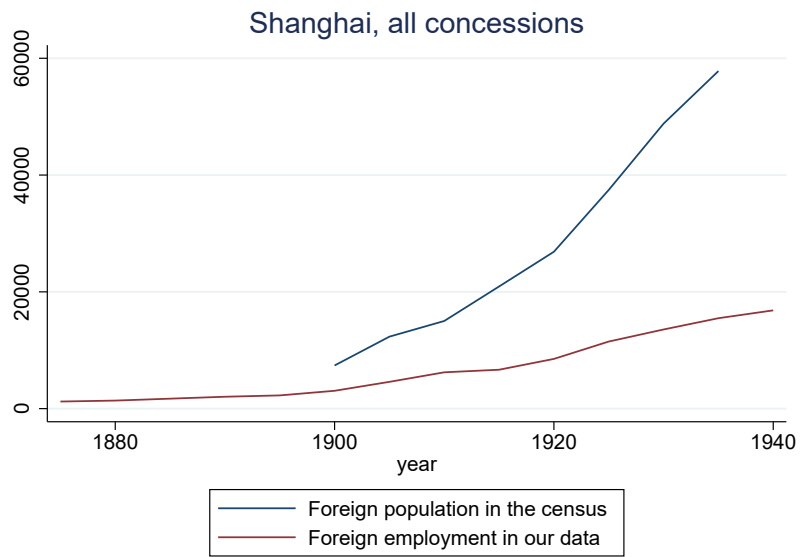
Notes: This table reports the estimated effect of the 1923 trademark law on Western firms' employment, using alternative measures of trademark intensity. The dependent variable is the natural log of a firm's employment in a given year. Post trademark law is a dummy denoting the period after the establishment of the trademark law in 1923. Country-groups are Western, China, and Japan. All regressions include firm, country-times-year, and industry-times-year fixed effects. Standard errors clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

Table D.6: Quality Advertisements

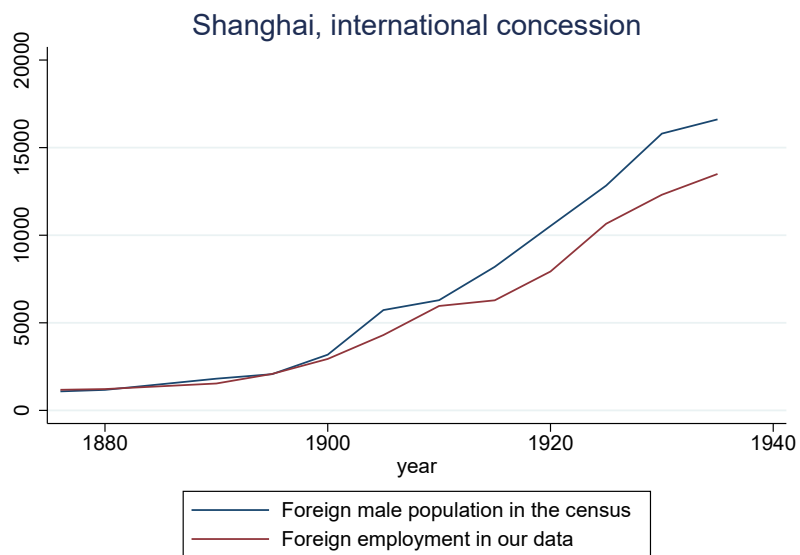
	(1)	(2)	(3)
	Quality adv. dummy	ln(quantity advertising days+1)	$\sinh^{-1}(\text{quality advertising})$
Post 1923 * trademark intensity			
– Western Firms	0.119 (0.425)	0.979 (0.689)	0.996 (0.750)
– Chinese Firms	-0.363 (0.268)	-0.001 (0.664)	-0.118 (0.696)
– Japanese Firms	n/a	n/a	n/a
Observations	3,098	3,098	3,098
R-squared	0.585	0.671	0.669

Notes: This table reports the estimated effects of the trademark law on quality advertising of Western firms on Shen Bao. The sample includes Western firms located in Shanghai's concessions with employment and activity information between 1920-1926. The dependent variables are the dummy of having quality advertisements on Shen Bao in a specific year, logged numbers of quality advertising days of quality advertisements, and the inverse sine of quality advertising days of advertisements, respectively. Trademark law is a dummy denoting the trademark law established in 1923. Trademark intensity is a firm-specific measure of trademark dependence based on each firm's pre-1923 product mix and product-level trademark intensity calculated using each product's share in total pre-1923 trademarks. There is no effect estimated for Japanese firms, because there are no Japanese advertisements highlighting quality in our sample. All regressions include firm, country-times-year, and industry-times-year fixed effects. Standard errors clustered by product category and country-year. *** p<0.01, ** p<0.05, * p<0.1.

E Online Appendix — Figures



(a) All concessions



(b) Public concession

Figure E.1: Data Validation

SHANGHAI HONG LIST, 1927

A	時 凱 <i>Ka-ze</i>	大 美 保 險 公 司
<p>房 字 印 業 商 <i>Sang-yih-in-ze-fang</i> 0-483-4 Kiukiang Rd. Cent. 7611</p>	<p>7 Ezra Road Cent. 1864 Tel Add: Abkata Abraham, Katz & Co. <i>Importers and Exporters.</i> Katz, M.</p>	<p>Room 113, H. & S. Bank Bldg. Tel Add: Happy Adams, William A. <i>General Insurance Broker</i> Adams, W. A. Cheng, S. F. <i>Agents for—</i> Great American Ins. Co.</p>
<p>A.B.C. Press <i>Printers</i> Hanggi, Ed., mng. dir. Fischer, W. Ossipoff, M. Ennock, A. Fedin, D. Strashnickoff, C. Posniakoff, M. Burak, L. A. Kohler, Miss E. Baskin, L. Bleidin, I. Moh Kee Kong Chang Yung Fang</p>	<p>司 公 限 有 造 製 池 電 蓄 12A Nanking Road Cent. 4195 Tel Add: Tudorwerk Accumulatorenfabrik- Aktiengesellschaft (Engineering Office) Schmidt, G., mgr. Schade, Miss M.</p>	<p>同 大 <i>Dah-dong</i> 244/6, H. & S. Bank Bldg. Cent. 910 Tel Add: Spindles Adamson & Co. (Shanghai), Ld., J. <i>Textile Engineers</i> Adamson, J., mng. dir. <i>Agents—</i> Howard & Bullough, Ld.: Cotton Machinery Yates & Thom, Ld.: Boiler Makers and Engineers John Barker & Sons: Lifts, etc. John Pilling & Sons, Ld.: Looms and Accessories William Drake, Ld.: Healds and Reeds</p>
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<p>豐 益 <i>Yik-foong</i> 23 Peking Road Tel Add: Higson Abraham, D. E. J. <i>Merchant</i> Abraham, R. D. Cohen, M. M. Moses, L. Lee, S. M. Chow, C. J. Kong, W. M.</p>		

Figure E.2: Example of a page from the Hong List, 1927

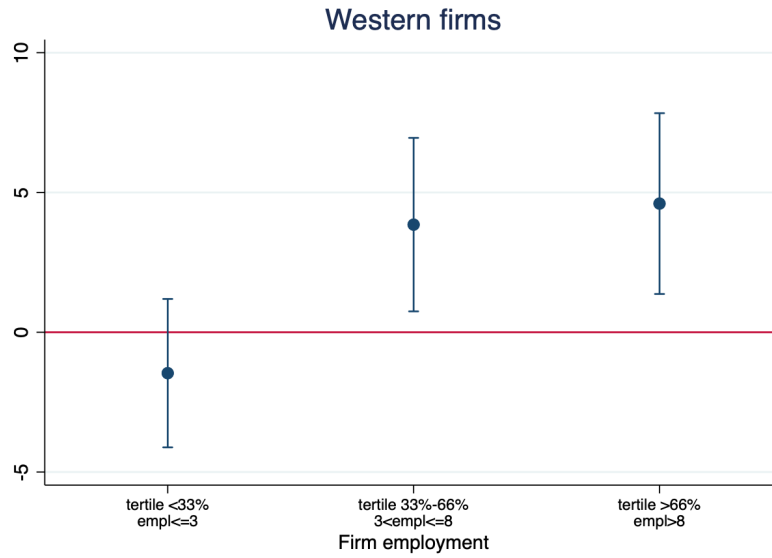


Figure E.3: The Heterogeneous Effect of the Trademark Law across Western Firms

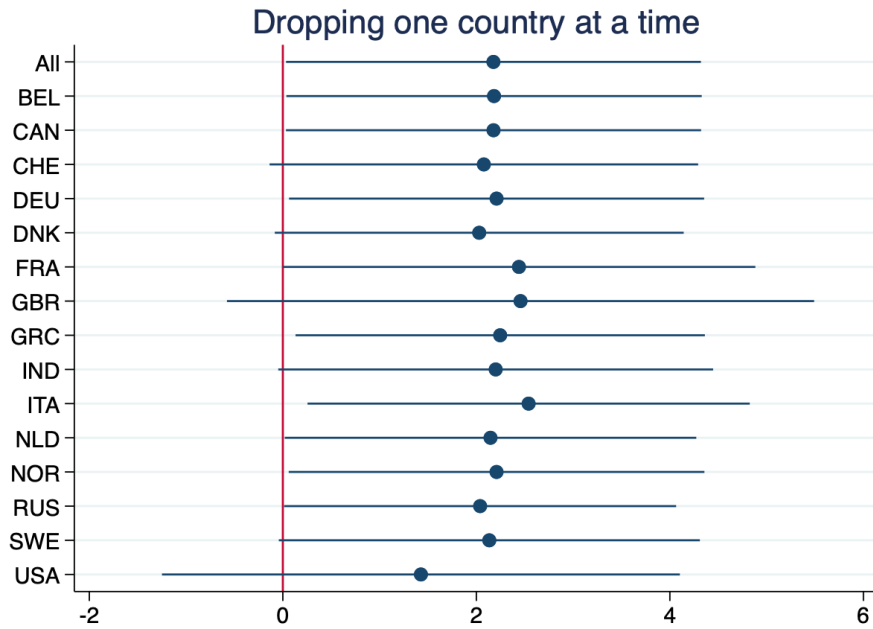


Figure E.4: The Effect of the Trademark Law on Employment of Western Firms, dropping one home country at a time

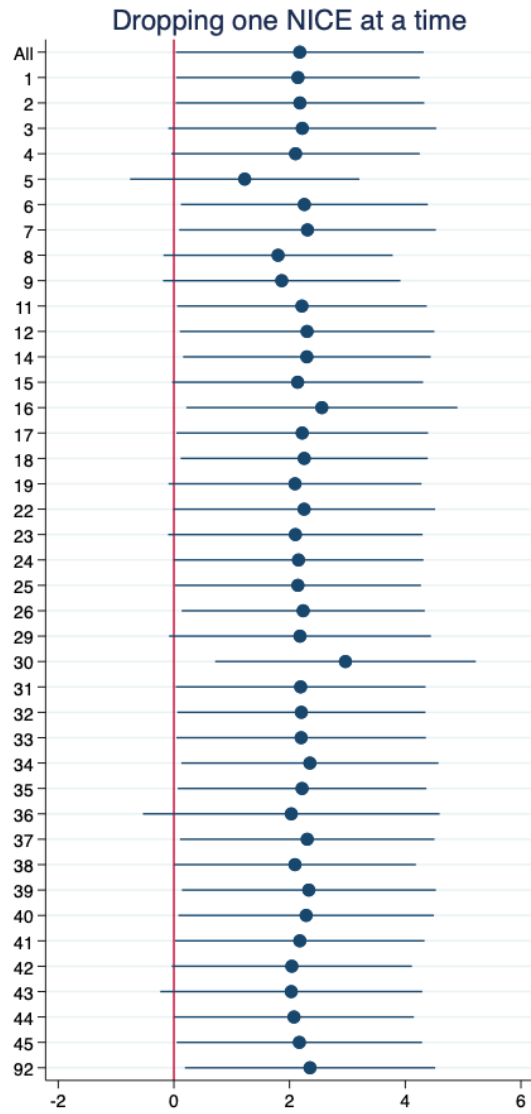


Figure E.5: The Effect of the Trademark Law on Employment of Western Firms, dropping one NCL product category at a time

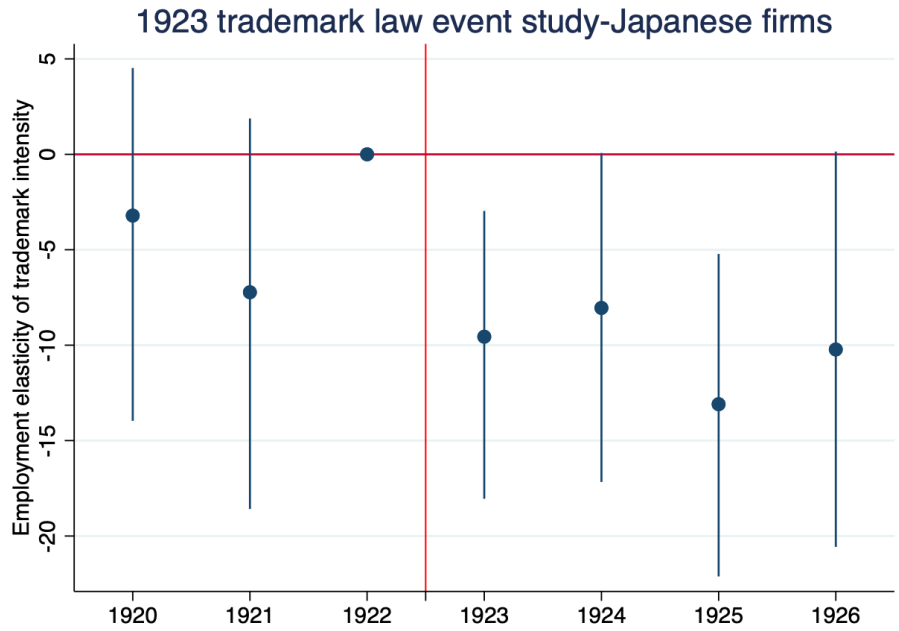


Figure E.6: The Effect of the Trademark Law on Japanese Firm Employment: Event Study

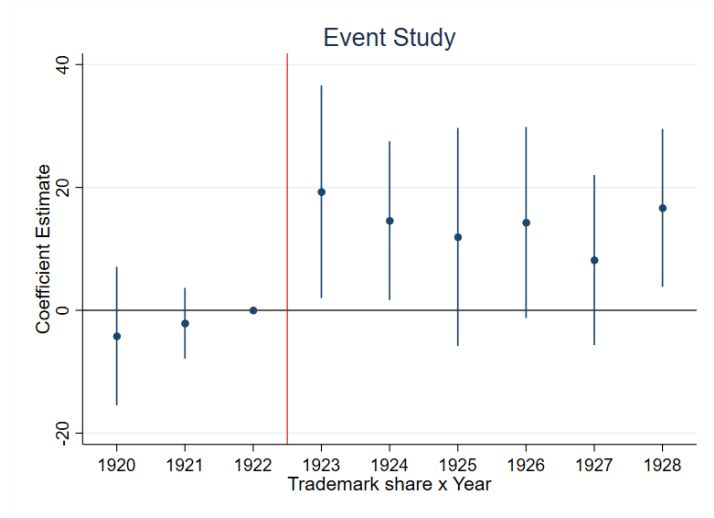


Figure E.7: The Effect of the Trademark Law on Chinese Imports from Western countries: Event Study

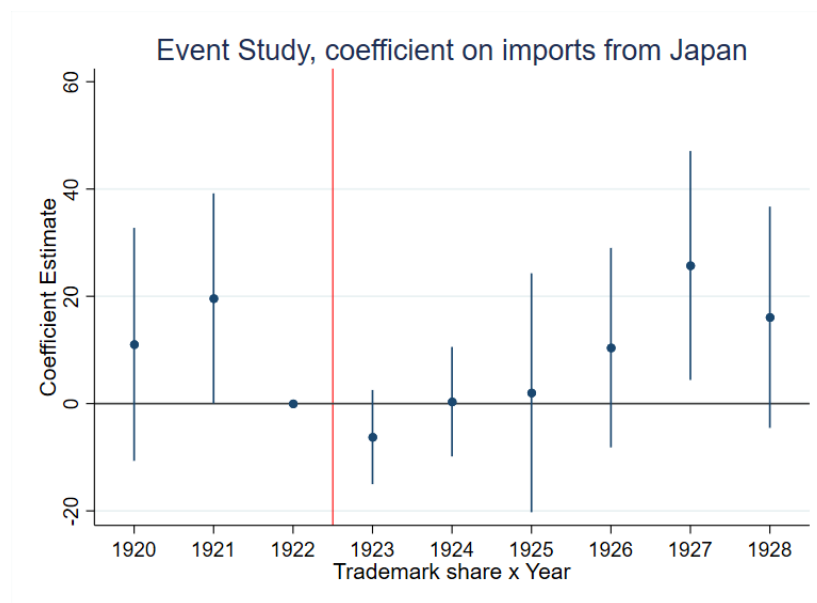


Figure E.8: The Effect of the Trademark Law on Chinese Imports from Japan

Notes: Estimating equation (3) is appended by observations from Japan, and all coefficients are estimated separately for Japan and non-Japanese countries. The figure just plots the time varying coefficients for Japan, as the coefficients for non-Japanese countries are identical to Figure E.7.