



Taste-based discrimination evidence from a shift in ethnic preferences after WWI

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ABSTRACT

This paper uses program notes from the Metropolitan opera to quantify changes in ethnic preferences as a result of news of German atrocities during World War I; these data indicate that the War created a persistent shift in ethnic preferences, which effectively switched the status of German Americans from a mainstream ethnicity to an ethnic minority until the late 1920s. Difference-in-difference analyses investigate whether this shift in preferences triggered taste-based discrimination in one of the world's most elite professional settings: applications to trade at the NYSE. This analysis indicates that changes in preferences more than doubled the probability that applicants with German-sounding names would be rejected. Placebo regressions for other non-German minorities yield no evidence of taste effects. Equivalent regressions that distinguish German Jewish from other Jewish applicants, however, indicate that German Jewish applicants were similarly affected as were other Germans.

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Although empirical tests of discrimination have shown that minorities are disadvantaged in hiring decisions,¹ it has proven difficult to establish whether such differences result from biased preferences and thus reflect taste-based discrimination (Becker, 1957). Taste-based discrimination is especially hard to distinguish from statistical discrimination,² where ethnicity serves as a signal for unobservable productivity differences. Existing empirical tests have exploited detailed performance data on athletes³ and taken advantage of the ability to randomly assign players to ethnicities in experimental settings.⁴ There is, however, only limited systematic evidence for taste-based discrimination at the highest level of professional jobs, where glass ceilings may continue to obstruct the entry of minorities and women (Blau and DeVaro, 2006).

This paper exploits an exogenous shift in preferences during World War I to investigate the incidence of taste-based discrimination in an extremely elite and financially sophisticated setting, where one would least expect to observe discrimination: applicants to trade at the New York Stock Exchange (NYSE). First, it creates quantitative indicators of ethnic preferences

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¹ Goldin and Rouse (2000) show that gender discrimination limits the hiring of female musicians in major orchestras, while other studies have focused on identifying discrimination at lower levels of skills. Bertrand and Mullainathan (2004) find that applicants with black-sounding names are less likely to be invited for job interviews. Charles and Guryan (2008) show that wage differentials between black and white workers are larger in more racially integrated states. In a long run context, Myrdal (1944), Wright (1986), and Maloney and Whatley (1995) document that black workers were systematically excluded from employment in new industries until the 1940s. Margo (1990) demonstrates that any improvements in the occupational status of blacks prior to 1950 resulted from the migration of black workers to the North. Heckman and Payner (1989) and Donohue and Heckman (1991) show that restriction on black employment persisted until concerted anti-discrimination policies took effect after the Civil Rights Act of 1964, and that such policies were most effective in the South.

² Phelps (1972); Arrow (1972); Aigner and Cain (1977); Coate and Loury (1993).

³ Kahn and Sherer (1988); Nardinelli and Simon (1990) and Price and Wolfers (2010).

⁴ E.g., Fershtman and Gneezy (2001). See Kahn (1991a and 2000) for comprehensive surveys of this literature, and List (2004) for an empirical study of both types of evidence. Levitt (2004) uses data on the television game show *Weakest Link* to identify bias against minorities, the elderly, and women.

to measure the intensity and persistence of changes in ethnic preferences as a result of World War I (1914–1918). These measures indicate that World War I created a lasting shock to ethnic preferences, which effectively switched the status of German Americans from a well-assimilated mainstream ethnicity to an ethnic minority until the late 1920s, nearly a decade after the end of the war. The second part of the analysis takes advantage of this change in preferences to investigate the incidence of taste-based discrimination in the elite professional environment of traders at the NYSE.

Applications to the NYSE provide an ideal setting for testing the effects of changes in ethnic preferences over time. Traders at the Exchange have been selected by the same process since 1883, when the NYSE began to record detailed information on its admissions decisions, to December 29, 2005, when the last seat sold for \$3.5 million before the NYSE became a publicly traded company. The NYSE admissions process also shares an important feature with the hiring processes of modern-day professional firms: decisions on admissions are made independently of the price of admissions. Co-workers select applicants based on personal characteristics, while applicants negotiate the price of admissions with a current member who wants to leave the Exchange.

Quantitative measures of revealed preferences establish that World War I created a persistent shock to ethnic preferences. The first measure examines program notes of nearly 2000 performances at the Metropolitan Opera in New York. These data reveal that the share of operas by German-language composers fell from 50 to less than 10% at the beginning of the war, and did not recover until the late 1920s. The second measure is constructed from the names of newborn boys in the U.S. Census. These data show that the frequency of German-sounding names dropped dramatically after the beginning of the war. The third measure relates to the consumption of ethnic foods. It reveals, for example, that the consumption of sauerkraut declined to almost zero after the beginning of the war, and that hamburgers were advertised as “liberty steaks” until the late 1920s.

The empirical strategy uses this persistent change in tastes to estimate difference-in-differences regressions of admissions decisions on ethnicity variables, time variables, and controls. Variation in “ethnicities” is captured by ethnic-sounding names, such that German Americans are defined as U.S. citizens with German-sounding names.⁵

Detailed data on veto votes and on rejection rates for more than 5000 applications to the NYSE between 1883 and 1936 show that applicants with German-sounding names (compared with Anglo-Saxons) were twice as likely to be rejected between 1914 and 1929. Regressions of time-specific treatment effects indicate that effects on rejection rates were strongest between 1914 and 1920, when changes in ethnic preferences were most intense. Placebo regressions for other non-German minorities, including Irish, Russian, and Italian Americans yield no evidence of taste effects, suggesting that differential treatment was limited to German Americans. Equivalent regressions that distinguish German Jewish from other Jewish applicants, however, indicate that German Jewish applicants were similarly affected as other Germans.

A natural concern with the empirical strategy is that World War I may have lowered the real or perceived productivity of Americans with German-sounding names. For example, German Americans may have been feared as a security threat during the war. Alternatively, their productivity as NYSE traders may have been compromised by the war, if they were more dependent on business with Europe.

To test informally for productivity effects, I examine declassified case files of the Bureau of Investigation (today's FBI) between 1908 and 1921. In FBI records on the NYSE, no German American traders were suspected of unpatriotic activities, even though some Anglo-Saxons were suspected. Similarly, archival records from the NYSE indicate that German Americans were no more likely to conduct foreign business at the NYSE than were other traders. There is also no evidence that German Americans were more likely to fail in business during World War I than were other Americans.

Most importantly, however, census records indicate that the quality of German American applicants increased after 1914. For example, the average German American applicant had five additional years of work experience after 1914, compared with the pre-war period. Thus, census data suggests that the expectation of discrimination may have increased the quality of the average applicant with a German sounding name.

Interestingly, the data yield no evidence that German Americans paid higher prices to be admitted to the NYSE. This difference in effects most likely arises from an admissions process where co-workers, who do not benefit from higher prices, decide on admissions. At the NYSE, applicants negotiate the price of admissions with traders who plan to leave the Exchange, while remaining traders decide on the applicant's admission. As a result, minority applicants cannot compensate future co-workers for biased preferences, so that market mechanisms cannot eliminate discrimination.⁶

The rest of this paper is organized as follows. [Section 1](#) presents measures of revealed preferences to establish the timing and persistence of the war's effects on ethnic preferences. [Section 2](#) describes the NYSE's process of admissions. [Section 3](#) introduces the data; [Section 4](#) presents empirical results, and [Section 5](#) examines archival sources evidence on productivity effects. [Section 6](#) presents regressions for seat prices, and [Section 7](#) concludes.

⁵ For example, U.S. baseball legend Lou (Ludwig) Gehrig would be counted as German American.

⁶ Discrimination by fellow NYSE traders could result from either co-worker discrimination or customer preferences (e.g., [Becker, 1957, 1971, 2nd edition](#)). For example, NYSE traders may vote against applicants with German-sounding names because they fear that a German-sounding NYSE would be less attractive to investors. Discrimination based on customer preferences has been shown to persist in sports teams even with perfect competition ([Kahn, 1991b](#); [Nardinelli and Simon, 1990](#)).

1. World War I as a shock to preferences

Historical evidence suggests that German Americans were well-integrated in the United States before the war.

Repeatedly, older Americans praised them as law-abiding, speedily assimilated, and strongly patriotic....In 1908, a group of professional people, in rating the traits of various immigrant nationalities, ranked the Germans above the English and in some respects judged them superior to the native whites (Higham, 1998, p.196).

When Germany attacked neutral Belgium on August 4, 1914, however, news of German atrocities began to arrive in the United States.

Towns were sacked and burned, homes were pillaged; in many places portions of the population, men, women, and children, were massed in public squares and mowed down by mitrailleuses... children were shot down, by military order, in cold blood....infants in their mothers' arms were shot down without mercy (United States Secretary of State, 1923).

In response to such news respect gave way to hostility. On April 5, 1918, The St. Louis Globe-Democrat reported the lynching of Robert Praeger: "German Enemy of U.S. hanged by mob."⁷ Milder types of abuse, including tarring and feathering, occurred dozens of times. Frank Brocke, a German American farmer, recalls

I would say you suffered more for the fact if you were of German descent more than anything else (sic). ...It was just that there was a lot of hatred against the Germans and if you were German, you were a little bit tinted, I guess (Oral history project of the Latah County Historical Society, <http://users.moscow.com/lchs/>).

Mothers lobbied to prohibit German lessons in public schools, and in 1919 it became illegal to teach German in Ohio, Iowa, and Nebraska (Wittke, 1936, pp.179–190). These prohibitions remained in place until 1923, when the Supreme Court ruled them to be unconstitutional (Meyer vs. State of Nebraska, 262 U.S. 390, 1923).⁸

1.1. The share of German-language operas at the Met

Quantitative measures of ethnic preferences make it possible to assess the strength and timing of such changes in tastes. The first measure counts the share of operas by German-language composers. In the early years of the 20th century, German-language composers dominated the repertoire of the Metropolitan Opera (Fig. 1). In 1910, 19 in 44 operas were by German-language composers.⁹ Nine of these were by Richard Wagner, with strong Germanic themes, including Lohengrin, Tannhäuser, and Tristan und Isolde. From 1910 until early 1917, half of the Met's operas were German. In 1917, however, the share of German-language operas declined from 9 in 10 operas prior to the declaration of war to 4 in 33 afterwards. This change is especially dramatic considering that it can take several years to prepare an opera.¹⁰ In fact, 2 of the 4 German-language operas, Wagner's *Meistersinger* and *Tristan und Isolde*, were performed within a week after the declaration of war. In 1918, only 3 in 40 operas were by German composers.

Recitals of German-language music continued to decline for several years after the Armistice on November 11, 1918. In 1919, only 7% of the Met's repertoire featured German-language composers. Shares stayed low, at 10% in 1920, 12% in 1921, and 13% in 1922. It took until 1923 for the share of German operas to recover to 25% of the Met's repertoire.

Opera data also confirm the observation of social historians that World War II did not have a similar effect on German Americans in the United States. Historical accounts indicate that enmity during World War II focused on Asian, and especially Japanese Americans (e.g., Dower, 1996, p.169). Changes in the share of German opera are consistent with this observation; after a small drop in 1939, the share of German-language operas continued to increase and reached 46% of the Met's repertoire in 1945 (Fig. 1).¹¹

⁷ Hickey, 1969. Also see Chicago Daily Tribune (April 5, 1918) and New York Times (April 4, 1918).

⁸ The war's effect on the use of the German language persisted well into the 1920s. In 1916, 13,800 students studied German in Cincinnati; by 1917, this number had fallen to 7000. Germans were barred from many social clubs that they had previously dominated. In New York, the Chemists' Club, the Lamb Club, and the New York Athletic Club expelled all German-born members, and banned the use of German on their premises (New York Times, April 11, 20, and May 5, 1918).

⁹ Data are collected from historical schedules of performances in the online archives of the Metropolitan Opera in New York. German composers include Carl Maria von Weber, Engelbert Humperdinck, Friedrich Handel, Friedrich von Flotow, Giacomo Meyerbeer, Hermann Goetz, Jacques Offenbach, Ludwig van Beethoven, Max von Schillings, Peter Cornelius, Richard Strauss, and Richard Wagner. German-language composers further include Austrian composers Wolfgang Amadeus Mozart, Ernst Krenek, Franz von Suppé, Johann Strauss Jr. and Franz Schubert and the Bohemian Christoph von Gluck. Composers are assigned to ethnicities based on their country of birth, which means that Beethoven and Handel are counted as German, even though Beethoven was also active in Vienna and Handel in London. Multiple performances of the same opera are counted as one. In addition to opera houses, concert halls and radio stations also avoided German music, and musicians who performed German pieces risked violent protest (New York Times, October 3 and 19, 1919).

¹⁰ New York Times, January 20, 2008, citing Opera America. The librettos of the two remaining German operas, Gluck's *Iphigenie* and Flotow's *Martha*, were translated into Italian.

¹¹ Music historians observe that "The War—in marked contrast to World War I—has not interfered with the production of opera in German. One of the marked highlights of last season was the complete presentation of Wagner's 'Ring,' so successful that the whole circle had to be repeated" (Heinsheimer, 1945, p.8).

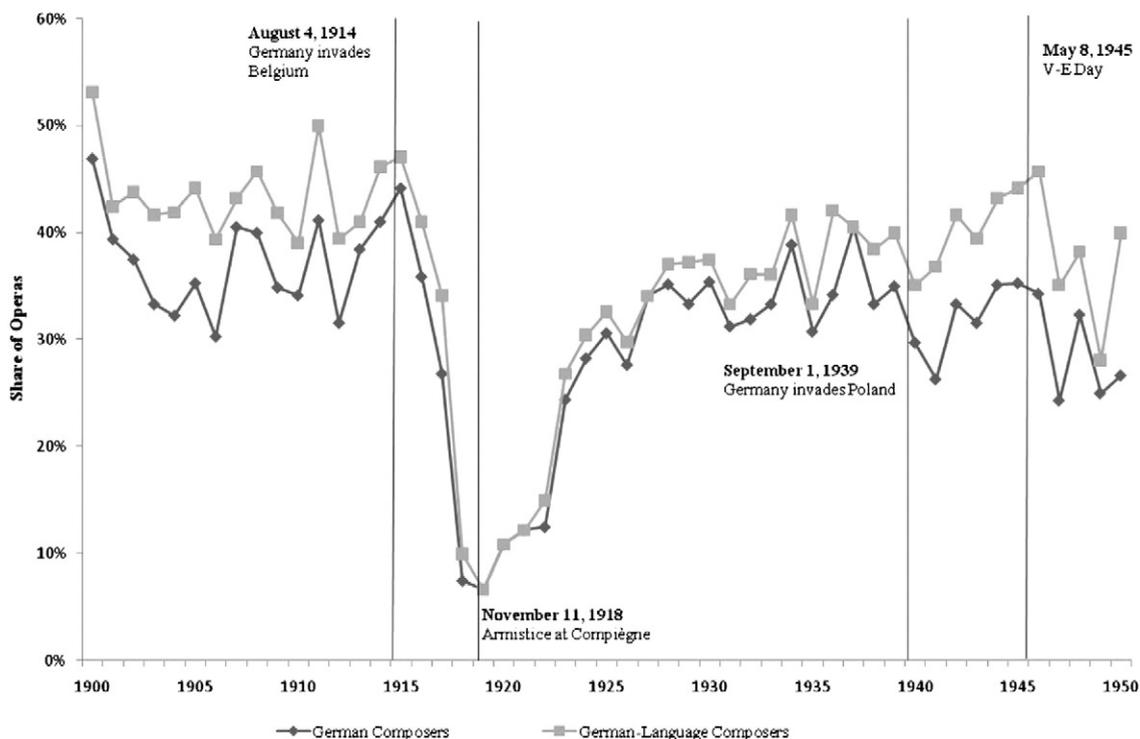


Fig. 1. The share of German-language operas from 1900 to 1950. Notes: Data on operas are collected from historical schedules of performances in the online archives of the Metropolitan Opera in New York. German-language composers include Austrian and Bohemian composers.

1.2. Names of newborn boys

Another measure of ethnic preferences can be derived from naming practices, which have been found to reflect attitudes towards ethnicities (Liebersohn, 2000). To construct these data, I count newborn boys named Otto or Wilhelm between 1910 and 1919 (United States Census 1920). Both Otto and Wilhelm have strong ethnic connotations: Otto von Bismarck was Prussia's Prime Minister from 1862 to 1890 and German Chancellor from 1867 to 1890. Bismarck's namesake was Otto I, King of the Germans from 936 to 973, who was succeeded by a long line of kings named Otto. Wilhelm II was German Emperor at the beginning of the war; he had succeeded his grandfather Wilhelm I (1797–1888) to the German throne.

U.S. census data show that the number of newborn boys named Otto and Wilhelm declined sharply after 1914 (Fig. 2). From 1915 to 1916, Otto dropped by 34.7%, from 2133 to 1394, and Wilhelm declined by 35.0% from 140 to 91. At the same time, the number of boys named William, as the English equivalent to Wilhelm, increased by 3% from 2269 to 2345.¹²

1.3. Ethnic foods

Data on the consumption of ethnic foods yield additional evidence for a persistent change in ethnic preferences. U.S. consumption of sauerkraut—a distinctly German dish of fermented cabbage—declined by 75% between 1914 and 1918, causing New York's grocers to complain that "There is enough sauerkraut in stock at the present time to feed a good-sized German army" (New York Times, April 25, 1918, p.10).¹³ As late as 1928, the Department of Agriculture found it necessary to argue that sauerkraut was not of German origin: "It is known to have been made at an early date in Alsace, now a part of France, and also in Holland, where the manufacture of sauerkraut is still an important industry" (United States Department of Agriculture, 1928, p.1). Pretzel manufacturers similarly argued that pretzels originated in an Italian cloister, and cheese merchants demonstrated that limburger came

¹² An additional test, which compares the number of boys named Heinrich and Henry in the U.S. Census of 1910, 1920, and 1930, confirms the results for Wilhelm versus William. While the number of boys named Heinrich declines between 1910 and 1920 and recovers only after 1920, the number of boys named Henry continues to increase during World War I.

¹³ Reports made to the Bureau of Agricultural Economics confirm that production by large manufacturers dropped from 124,849 tons in 1917 to 116,500 tons in 1918 to 47,900 tons in 1919, 67,100 tons in 1920, and 64,900 tons in 1921 (U.S. Department of Agriculture, 1928, p.3).

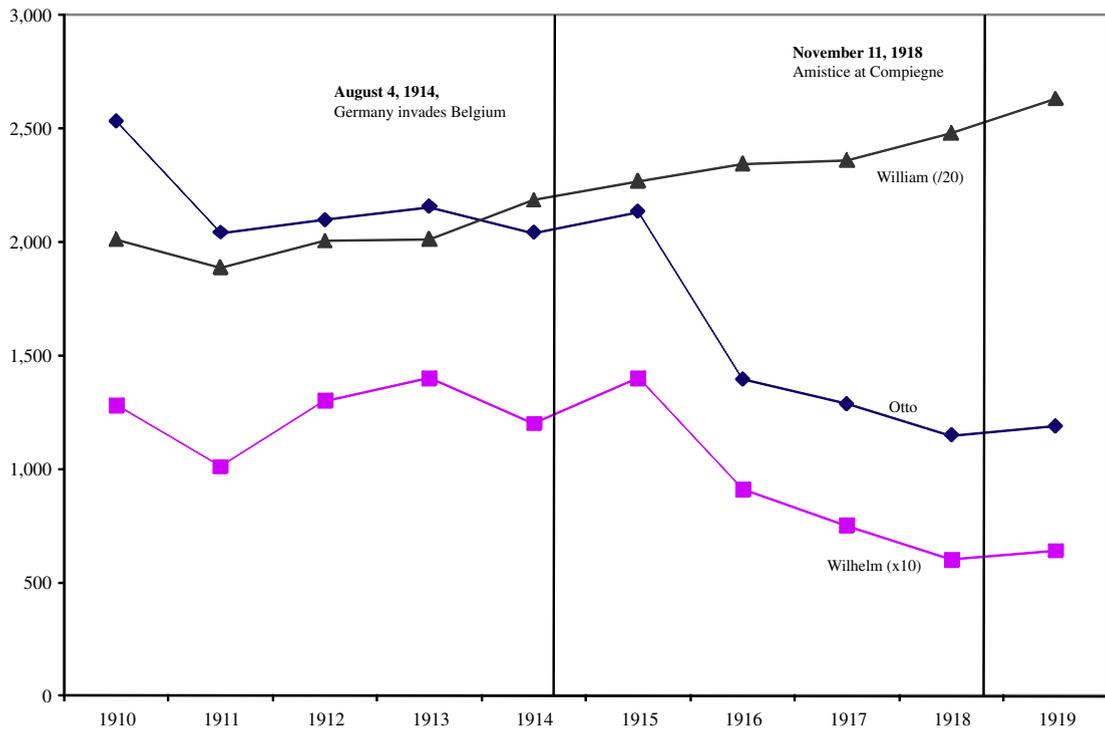


Fig. 2. Boys named Otto, Wilhelm, and William from 1910 to 1919. *Notes:* Data are constructed by counting the number of children with the name Otto or Wilhelm born between 1910 and 1919 and recorded in the United States Census of 1920. To scale the series in one graph, the number of Wilhelms is multiplied by 10 and the number of Williams is divided by 20.

from Belgium (Wittke, 1936, p.186). Other ethnic German foods were renamed to rescue sales. For example, butchers marketed hamburgers as “liberty steaks” throughout the 1920s.¹⁴

In sum, evidence from opera performances, baby names, and ethnic foods indicates that the war created a strong shift in preferences, which persisted throughout the 1920s. The analysis exploits this shift in preferences to discrimination against applicants to trade at the NYSE.

2. The NYSE's process of admissions

To trade at the NYSE, any U.S. citizen above the age of 21 could apply to purchase one of 1375 memberships or “seats.”¹⁵ Eighty percent of applicants between 1883 and 1936 negotiated a purchase directly with an incumbent trader who wanted to leave the exchange. The remaining 20% were sold in an anonymous auction, which was administered by the Committee of Admissions. Typically, the Committee stepped in for a trader who had died, failed in business, or been expelled. Then, “his membership may be sold by the Committee, creditors who are members of the Exchange having a first lien upon the proceeds” (Eames, 1894, p.68).¹⁶ In both types of sales, the NYSE received a fixed initiation fee from the buyer, which was independent of the purchase price. This fee remained stable around 20,000 year 2010 dollars.

¹⁴ For example, the New Hotel Rosslyn in Los Angeles offered liberty steaks on its menus until 1927 (Metropolitan News Corporation, January 15, 2004). Similarly, cities abandoned German-sounding names. Kaiser Street in Portland, Oregon, became Marne Way; Berlin, Iowa, was christened Lincoln and East German-town, Indiana, became Pershing (New York Times, June 2, 1918; Wittke, 1936, p.184). The circulation of German-language publications also declined after 1914 even though the number of mother-tongue publications increased among 13 major ethnic groups (Kirschbaum, 1986, p.72; Wittke, 1936, p.115).

¹⁵ The first mention of the New York Stock Exchange occurred in The Diary or Loudon's Register in March 1792. Only two months later, on May 17, traders agreed to deal exclusively with each other. By 1879, the Exchange included 1100 traders. The first membership was sold in 1869 for 8000 dollars (ca. 100,000 dollars in 2010). Seats within the Exchange had become saleable eight years earlier, in October 1861 (Eames, 1894, pp.13, 14 and 43). Membership remained constant until 1929, when the NYSE granted every member the right to sell one quarter of a new membership during the quarter dividend sale, which increased the number of seats to 1375. Seats became available for lease in 1978.

¹⁶ There were no female applicants until 1967, when Muriel Siebert entered the NYSE.

After a buyer and seller agreed on a price, the NYSE's 15-member Committee of Admissions evaluated each applicant's "personal and financial integrity" (Eames, 1894, p.51). An anonymous trader explained why an applicant's integrity was so important for his co-workers:

Character is essential to the Stock Exchange member. He buys and sells in a milling, excited crowd around a trading post, and his contracts are oral. None is written and he must stand by his word of today, even though his transaction will show him a loss tomorrow (New York Times, August 24, 1924)

Typically, the Committee met every two weeks, and interviewed two or three applicants. Each applicant had to be sponsored by two existing members who could recommend him "in every way as a proper person to be admitted to the Exchange." Sponsors vouched for applicants' financial integrity by guaranteeing to "accept (the applicant's) uncertified check for \$20,000 if he were alone in business and a member of the Exchange" (Minutes of the Committee of Admissions 1904); this is equivalent to accepting a personal check for 3.0 million 2010 U.S. dollars.¹⁷ At its next meetings the Committee took an anonymous vote. If at least ten members were present and one third voted against the applicant, he was rejected. Until 1936, anonymous votes were recorded individually as white balls in favor and blackballs against an applicant.

3. The NYSE data

The main data for this study consist of 5097 applications from December 27, 1883 when the NYSE began to keep detailed records of its admissions decisions, to September 24, 1936, when the NYSE stopped recording the blackball data. Each observation includes the applicant's name, the seller's name, the price of the seat, the numbers of blackballs and white balls, the admissions decision, and the date of the decision.¹⁸ The data also include annotations that reveal whether a seat was auctioned by the Committee of Admissions, whether a seller had died or been expelled from the Exchange, and whether a seat was transferred for a nominal price.¹⁹

Voting data show that rejection rates increased from 3% before the war to 4% during the war; rejection rates declined back to 3% after 1929 (Table 1). Between 1883 and 1936, the average real price of a seat was 1.6 million dollars. Prices increased from 420,000 dollars in 1883 to 5.2 million dollars in 1929 and declined sharply thereafter (Fig. 3, in 2005 U.S. dollars).

3.1. Ethnic-Sounding Names

The main tests compare election outcomes for applicants with German- and Anglo-Saxon-sounding names. As a first step, given names and last names are matched with ethnicities by a commercial algorithm that takes advantage of linguistic rules and location-specific naming practices.²⁰ For example, surnames ending in "dda" or "ddo" are assigned to Sardinia and therefore Italy. This algorithm creates unique ethnicity matches for 84.2% of applicants. Ethnicities are combined into four groups, German, Anglo-Saxon, Jewish, and *Other Ethnicities*, where *Other Ethnicities* includes the unmatched data. German includes German, Austrian, and Swiss-German names; Anglo-Saxon includes English, Scottish, and Irish names. *Other Ethnicities* combines Dutch, Italian, Russian names, along with smaller ethnic groups; *Other Ethnicities* also includes German-American applicants with Anglicized German names, who may have been affected by anti-German tastes; this will make it harder to identify an effect of discrimination.

Name data indicate that Anglo-Saxons dominated the NYSE across all years (Fig. 4). In 1890, 64.7% of NYSE traders were Anglo-Saxons; in 1930, Anglo-Saxons continued to account for 60% of all traders. The share of German Americans increased gradually from 5.8% in 1890 to 6.5% in 1900, 8.2% in 1910, 8.9 in 1920, and 9.5% in 1930. The share of Jewish traders increased most rapidly from 1890 to 1910 (2.7% in 1890, 4.7% in 1900, and 7.2% in 1910) and more gradually afterwards (7.9% in 1920 and 8.6% in 1930).

The matching algorithm groups together German and non-German Jews, but German Jewish applicants may have been affected by anti-German sentiments. To measure such effects, I use passenger lists of immigrant ships that arrived at the port of New York (e.g., Passenger Lists of Vessels Arriving at New York, New York, 1820–1897) to separate German Jews from other Jews. Specifically, I match each Jewish applicant's last name to its most frequent country of origin.²¹ For example, Arthur Schiff applied to the NYSE on December 15, 1932, and is identified as Jewish by the matching algorithm. Shipping records show that 111 of 228

¹⁷ Prices are converted to real prices using nominal GDP per capita (Johnston and Williamson, 2011).

¹⁸ These data expand on existing data sets, which include the price and date for each membership sale but not the identity of buyers and sellers, or other characteristics of the sale. For example, Schwert (1977), Jarrell (1984), Golbe (1986), Keim and Madhavan (2000), and Davis et al. (2007) explore the effects of trading volumes and stock prices on the price of NYSE seats.

¹⁹ The share of nominal transfers increased from 11% before the war, to 17% during, and 21% after the war. Since nominal transfers typically occurred within firms, they may have been subject to less stringent reviews by the NYSE, which will make it harder to detect discrimination.

²⁰ See List Service Direct, Inc. (LSDI) at http://listservicedirect.com/ethnic_religious.html for a detailed description of the matching algorithm.

²¹ Such data are available because the Steerage Act of 1819, which Congress passed in response to a surge in immigration after the British-American War of 1812, required captains to submit complete lists of all passengers and ports of origins (Page, 1911). Records are available at ancestry.com. Ancestry's database combines the passenger lists of ships arriving at the Port of New York from 1851 to 1891 and from 1935 to 1938 with the passenger lists of vessels entering through Castle Garden from 1855 to 1890.

Table 1

Applications for membership at the New York Stock Exchange—summary statistics.

	Pre-War (Jan. 3, 1883 to June 14, 1914)	War (November 28, 1914 to February 13, 1929)	Post-War (February 13, 1929 to October 1, 1936)	All years (Jan. 3, 1883 to October 1, 1936)
Anglo-Saxon				
Applications	1207	707	1085	2999
Rejected (%)	2.9	2.4	2.5	2.6
Blackballs (%)	2.4	2.4	2.5	2.4
German				
Applications	149	117	169	435
Rejected (%)	4.0	7.7	1.2	3.9
Blackballs (%)	4.0	7.6	1.9	4.2
Jewish				
Applications	147	105	173	425
Rejected (%)	3.4	10.5	5.2	5.9
Blackballs (%)	3.1	8.0	3.6	4.6
Other				
Applications	467	309	462	1238
Rejected (%)	3.0	5.2	3.5	3.7
Blackballs (%)	2.7	4.7	3.8	3.6
All Ethnicities				
Applications	1970	1238	1889	5097
Rejected (%)	3.0	4.3	2.9	3.3
Blackballs (%)	2.6	3.9	2.9	3.0

Notes: Data on the identities of applicants and admissions decisions were collected from the NYSE Archives. Names were matched to ethnicities by a commercial algorithm that uses linguistic rules and location-specific naming practices. The category *Jewish* includes German Jewish and other Jewish names; *Other Ethnicities* includes anglicized German and Jewish names along with Italian, Russian, French, and Dutch names, as well as a number of smaller ethnicities. Blackballs (%) measures the share of anonymous votes that were cast against an applicant in the NYSE's 15-member strong Committee of Admissions. Applications get rejected if one third or more of all votes are blackballs; blackballs are recorded for 4998 applicants.

Schiff families came from Germany, 55 from Russia, 19 from Hungary, 17 from Poland, 13 from Austria, and 13 from Hestia (a German state). Thus, Jewish applicants with the last name Schiff are assigned to the new ethnicity variable German Jewish.

3.2. Bias and measurement error

Most importantly, algorithms that assign names to ethnicities are optimized to match current-day naming practices, which will make it harder to detect discrimination in the early 20th century. Expectations of discrimination may also discourage the use of ethnic-sounding names (Bertrand and Mullainathan, 2004; Levitt and Fryer, 2004, p.770). Census data (in Section 2)

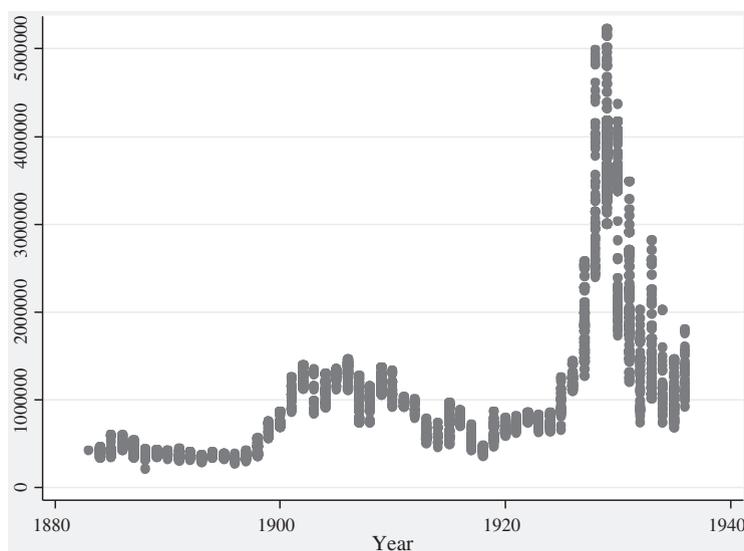


Fig. 3. NYSE seat prices, 1883–1936. Notes: Price data are collected from the ledgers of transactions at the Archives of the NYSE.

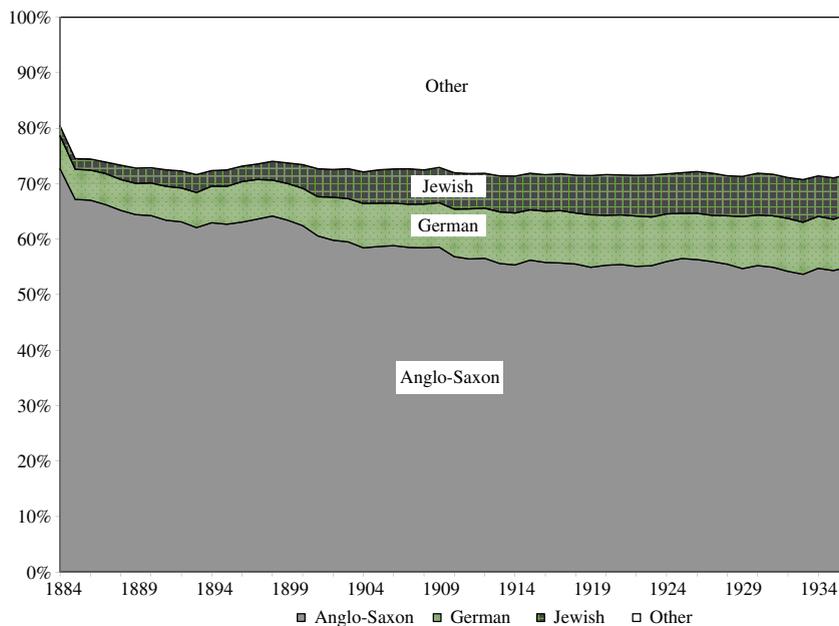


Fig. 4. Ethnic composition of the NYSE from 1886 to 1936. *Notes:* The ethnic composition is computed by subtracting buyers and adding sellers before 1925 and adding buyers and subtracting sellers after 1925 from the stock of members listed in the *Directory of the New York Stock Exchange* (1925). Buyers' and sellers' names are collected from the ledgers of transactions in the archives of the NYSE. Names are matched to ethnicities by a commercial algorithm that uses linguistic rules and location specific naming practices. *Other ethnicities* include Anglicized German and Jewish names along with Dutch, Russian, French, and Italian applicants.

have shown that the war reduced the popularity of German first names such as Otto or Wilhelm. Similarly, Germans may have anglicized their last names to avoid discrimination. For example, the *New York Times* (June 2, 1918) reports that “Loyal citizens who possess German forms of the patronymic are striking them out.”

Since German American applicants with anglicized names are counted as *Anglo-Saxon* or *Other Ethnicities* some applicants in the control group will also be affected by changes in tastes, which creates a downward bias in the estimated coefficients. For example, Arthur Rittmaster applied to the NYSE in 1924 and was rejected. Rittmaster is an anglicized version of the German name Rittmeister (“cavalry captain”). The matching algorithm assigns Rittmaster to *Other Ethnicities*, though his contemporaries may have perceived the name as German.

Similarly, the data on countries of origins for Jewish names may assign German Jews to be Anglo-Saxons (and therefore *Other Jews*) because the data are measured at a ship's most recent port of departure before arriving in the United States. For example, German Jewish immigrants may have traveled to the United States via Britain, or a German ship may have stopped in London before setting sail for the United States. This also creates a downward bias in the estimated effects.

3.3. Comparing pre-war and war

To examine the effect of World War I, the analysis separately estimates coefficients for the pre-war and war period, compared with post-war data as a control. This makes it possible to directly observe pre-existing levels of differential treatment in the pre-war period when German Americans and other immigrant groups may also have been subject to discrimination (e.g., Higgs, 1977). The pre-war period begins with the first recorded sale of a NYSE seat on January 3, 1883, and extends to the beginning of World War I, on June 28, 1914, when Archduke Franz Ferdinand was assassinated in Sarajevo. The NYSE closed for business a few days after the Archduke's death and remained closed until November 28, 1914. By that time, Germany had invaded Belgium.

To be as conservative as possible, the war period includes data until 1929, and coefficients are also estimated separately for individual years. Measures of ethnic preferences indicate that the war's effect on preferences was strongest immediately after the war and had weakened by the mid 1920s. As a result, including data until 1929 in the war period creates a downward bias in the estimated coefficients of the war's effect. Consistent with this idea, estimates of time-specific treatment effects suggest that the war's effect weakened over time (Figs. 6 and 7).

The post-war period begins with the first quarter dividend transaction on February 13, 1929. In the quarter dividend sale, the NYSE expanded its membership from 1100 to 1375 by granting each existing member the right to sell one quarter of a seat. Eighty-four percent of quarter dividends were sold in 1929; the last quarter dividend sale occurred in March

1932.²² The post-war period includes the stock market crash on Black Thursday, October 24, 1929, the Great Depression, and the first three years of the Nazi regime. The data end on October 1, 1936, when the NYSE stopped recording blackballs.²³

3.4. Census data on applicants

Census data provide additional information on applicants, which makes it possible to measure changes in the quality of German American applicants. For example, applicants with German sounding names may have been less experienced and therefore less productive or more likely to have German-born parents and therefore more likely to pose a security risk after 1914. If this is true, an observed increase in rejections could be driven by changes in the quality of applicants rather than ethnic preferences.

To measure such variation, I have matched German American applicants between 1900 and 1920 with their responses to the U.S. census of 1920. This census is particularly valuable because it includes questions on parents' place of birth, respondents' native tongue, as well as age and home ownership as a proxy for wealth.²⁴

Census data show that applicants with German-sounding names were less “German” after 1914. The share of applicants with a German-born father declines from 74 to 42%, and the share of applicants with a German-born mother declines from 50 to 26% (Table 2). Similarly, the share of applicants who are native German speakers declines from 12 to 8%, and the share of applicants whose parents are both native speakers declines from 50 to 24%. These data suggest that expectations of discrimination may have discouraged applicants with stronger ties to Germany from applying to the exchange, such that estimated effects may in fact understate the impact of ethnic preferences.

The data also suggest that the “quality” of applicants increased after 1914. Specifically, the average age of applicants increased from 31 to 36 years, which implies that the average German American trader had acquired 5 additional years of work experience in the war period compared with the pre-war period. This is consistent with evidence in Goldin and Rouse (2000), which suggests that the expectation of discrimination increases the quality of the average minority applicant.²⁵ Other potential measures of quality (home-ownership and marriage as measures of wealth and stability) show no significant changes.

4. Changes in admissions to the NYSE

Applications data indicate that rejection rates for applicants with German-sounding names nearly doubled after 1914. Before 1914, 4% of applicants with German-sounding names were rejected on grounds of “personal and financial integrity.” After 1914, 7.7% of German Americans were rejected (Table 1 and Fig. 5).

4.1. Difference in differences

Two-by-two tables compare changes in rejection rates for German Americans with changes in rejection rates for Anglo-Saxons. Rejection rates for German Americans were 3.7% higher after 1914, while rejection rates for Anglo-Saxons stayed roughly constant, with a slight decrease of 0.5% (Table 3, Panel A). The difference across German Americans and Anglo-Saxons in pre-and post-1914 differences is 4.2% (with a p-value of 0.068, Table 3, Panel A).

The identifying assumption for this test is that changes in rejection rates for German and Anglo-Saxons Americans would not have been systematically different in the absence of the war. Specifically, OLS would overestimate the effects of the war on applicants with German-sounding names if rejection rates for applicants with German-sounding names relative to Anglo-Saxons would have increased in the absence of the war. Expectation of differential treatment may, however, have systematically discouraged, rather than encouraged, lower quality applications (e.g., Goldin and Rouse, 2000), so that the difference-in-difference estimator may in fact underestimate the impact of ethnic preferences. Consistent with this idea, applicants with German-sounding names were less likely to have German-speaking parents in the war period compared with the pre-war period and had on average five additional years of work experience (Table 2).

The data also show that 0.575 additional blackballs were cast against the average German American applicant after 1914, compared with 0.041 fewer blackballs against Anglo-Saxons (Table 3, panel B). The difference across German Americans and Anglo-

²² Unlike sellers in regular transactions, quarter dividend sellers remained at the Exchange and may have been more likely to grant discounts to applicants whom they favored. There is, however, no evidence for such differences in the price data; prices during the quarter dividend sale seem to be driven primarily by economic considerations (section VI; also see Davis, Neal, and White 2007 for a detailed historical analysis of the quarter dividend sale).

²³ During the war period, the NYSE faced significant competition, which is likely to have mitigated the effects of discrimination (e.g., Becker, 1957; Higgs, 1977; Fishback, 1989; Black and Strahan, 2001). For example, the NYSE competed with an active curb market, the Consolidated Stock Exchange, the Coal Hole, the New York Gold Exchange, and the Open Board of Stock Brokers in New York, in addition to many regional exchanges (Eames, 1894, p.43). Between 1800 and 1970, some 200 local exchanges operated at one time or another. In 1910, the NYSE handled 68.5% of the total number of all stocks traded; other New York exchanges 21.2%; and the regional exchanges in Boston, Philadelphia, and Chicago 10.4%. Until 1926, the Consolidated alone held nearly a quarter of the market and employed up to 2000 traders (Brown et al., 2008).

²⁴ Thirty-four of 128 (Jewish and other) German Americans between January 1, 1900 and June 28, 1914 can be matched with their census records, compared with 38 of 68 German Americans between 1914 and December 31, 1919. Matching rates are higher for 1914 to 1920, which is closer to the census, but there is no indication that the quality of matches varies systematically for the pre and post-1914 data.

²⁵ Goldin and Rouse (2000) find that the expectation of discrimination discouraged female musicians of lower quality from applying for positions in prominent U.S. orchestras.

Table 2

Census data for applicants with German-sounding names 1900–1920.

		German-born		German-speaking		Naturalized citizen	Home-owner	Married	Mean Age
		Father	Mother	Self	Both parents				
Pre-War	Total	25	17	4	17	3	15	25	31
	N = 34%	74	50	12	50	9	44	74	
War	Total	16	10	3	9	5	14	30	36
	N = 38%	42	26	8	24	13	37	79	

Notes: Data are constructed by matching applicants with German-sounding names with individual responses in the United States Census of 1920. The census of 1920 is the only census that includes information on family backgrounds. Census documents can be accessed at www.ancestry.com. Data include Jewish and other German American applicants between 1 January 1900 and 28 June 1914 (*pre-War*) and 28 November 1914 to 31 December 1920 (*War*).

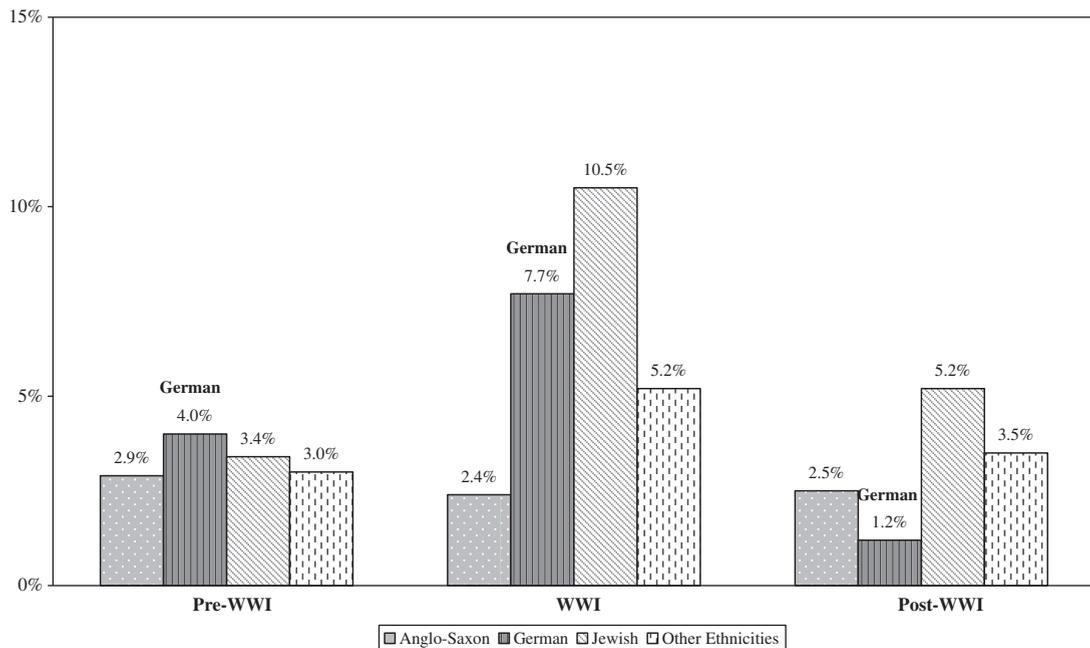


Fig. 5. Rejected applicants by ethnicity, 1883–1936. Notes: Data on names and election outcomes are collected at the archives of the NYSE. Names are matched to ethnicities by a commercial algorithm that uses linguistic rules and location-specific naming practices.

Saxons in differences across blackballs before and after 1914 is 0.616 (with a p-value of 0.007, Table 3, panel B), implying that the war added 0.62 blackballs against the average German American applicant.

Equivalent tests for Jewish Germans yield nearly identical results, confirming that ethnic bias affected applicants of both religions. Rejection rates for Jewish Germans increased by 6.3% after 1914, implying a difference in differences of 6.8% (with a p-value of 0.016, Table 3, Panel A). An additional 0.619 blackballs were cast against the average German Jewish applicant, implying a difference in differences of 0.66 (Table 3, panel B, with a p-value of 0.017), which is nearly indistinguishable from the estimate for other Germans.

4.2. OLS and logit regressions of rejections on ethnicities and controls

Regression analyses improve on difference-in-differences tests by controlling for other characteristics of applications that may have influenced admissions rates. In the most basic regressions of the original data, four ethnicity variables distinguish Anglo-Saxon, German, Jewish, and *Other Ethnicities*. Anglo-Saxons, who were the largest and socially dominant ethnicity, are used as a control. Regressions compare admissions decisions for the pre-war and war periods, with the post-war period as a control. This approach makes it possible to separately measure potential discrimination against German Americans before 1914 when German

Table 3
Means of rejection rates and blackballs by ethnicity, Pre-war versus War.

	Panel A: Rejections						Panel B: Number of blackballs					
	(Non-Jewish) German			Jewish German			(Non-Jewish) German			Jewish German		
	War	Pre-War	Difference	War	Pre-War	Difference	War	Pre-War	Difference	War	Pre-War	Difference
German American	0.077 (0.016)	0.040 (0.014)	0.037 (0.021)	0.087 (0.020)	0.024 (0.018)	0.063 (0.027)	0.966 (0.179)	0.391 (0.109)	0.575 (0.210)	0.809 (0.226)	0.190 (0.137)	0.619 (0.264)
Anglo-Saxon	0.024 (0.006)	0.029 (0.005)	−0.005 (0.008)	0.024 (0.006)	0.029 (0.005)	−0.005 (0.008)	0.304 (0.073)	0.345 (0.040)	−0.041 (0.084)	0.304 (0.071)	0.345 (0.039)	−0.041 (0.081)
Difference	0.053 (0.017)	0.011 (0.015)	0.042* (0.023)	0.063 (0.021)	−0.005 (0.019)	0.068** (0.028)	0.662 (0.194)	0.046 (0.116)	0.616*** (0.226)	0.505 (0.236)	−0.155 (0.143)	0.660** (0.277)

Notes: The p-value for the difference in differences in rejection rates is 0.068 for non-Jewish German Americans and 0.016 for Jewish German Americans. The p-value for the difference in differences in blackballs is 0.007 for non-Jewish German Americans and 0.017 for Jewish German Americans. German American refers to all U.S. citizens with German-sounding names. Data on admissions decisions and on the names of applicants were collected from the NYSE Archives. Names are matched to ethnicities by a commercial algorithm that takes advantage of linguistic rules and location-specific naming practices. This algorithm groups Germans Jews together with other Jewish Americans. To identify German Jews, Jewish applicants are assigned to the most frequent country of origin for immigrants with their last name in the arrival records of ships entering New York between 1850 and 1950. Standard errors in parentheses are based on a linear probability regression of rejection probabilities on ethnicities.

* p<0.10.

** p<0.05.

*** p<0.01.

Table 4
OLS and logit coefficients; dependent variable is 1 for rejected applicants, 0 for accepted.

	OLS (I–III)			Logit
	I	II	III	IV
German	−0.013 (0.015)	−0.014 (0.015)	−0.014 (0.015)	−0.795 (0.740)
Jewish	0.027* (0.015)	0.024* (0.015)	0.026* (0.014)	0.722* (0.397)
Other ethnicity	0.010 (0.010)	0.009 (0.010)	0.010 (0.010)	0.336 (0.323)
Pre-war	0.004 (0.007)	0.002 (0.009)		
Pre-war*German	0.024 (0.021)	0.023 (0.021)	0.031 (0.021)	1.371 (0.872)
Pre-war*Jewish	−0.022 (0.021)	−0.020 (0.021)	−0.018 (0.021)	−0.477 (0.636)
Pre-war*Other ethnicity	−0.009 (0.014)	−0.008 (0.014)	−0.009 (0.014)	−0.326 (0.461)
War	−0.001 (0.009)	−0.001 (0.010)		
War*German	0.066*** (0.023)	0.065*** (0.023)	0.059*** (0.023)	1.786** (0.852)
War*Jewish	0.054** (0.024)	0.056** (0.024)	0.053** (0.023)	0.777 (0.562)
War*Other ethnicity	0.018 (0.016)	0.018 (0.016)	0.015 (0.015)	0.348 (0.473)
Nominal	−0.024*** (0.007)	−0.022*** (0.007)	−1.091*** (0.353)	
Quarter dividend sale		0.003 (0.009)	0.012 (0.012)	0.371 (0.414)
Committee of Admissions		0.005 (0.007)	−0.001 (0.007)	−0.041 (0.207)
Constant		0.025*** (0.005)	0.028*** (0.008)	0.028*** (0.005)
Observations (Applications)	5097	5097	5097	4653
Groups (Years)			54	45
Year fixed effect	No	No	Yes	Yes
(Pseudo) R-squared	0.01	0.01	0.01	0.03

Notes. Data on the identities of applicants and admissions decisions were collected from the NYSE Archives. Names are matched to ethnicities by a commercial algorithm that uses linguistic rules and location-specific naming practices. The category *Jewish* includes German Jewish applicants. Column IV reports estimates from a logit regression with annual fixed effect; this regression drops nine years of data when no applicants were rejected.

* p<0.10.

** p<0.05.

*** p<0.01.

Americans and other immigrant groups may have been subject to discrimination (e.g., Higgs, 1977).²⁶ Time-ethnicity interactions such as *war***German* estimate difference in differences over time and across ethnicities.

$$\begin{aligned} \text{Rejected} = & \beta_0 + \beta_1 \text{German} + \beta_2 \text{Jewish} + \beta_3 \text{Other Ethnicity} + \beta_4 \text{pre-war} + \beta_5 \text{war} \\ & + \beta_6 \text{pre-war} \cdot \text{German} + \beta_7 \text{pre-war} \cdot \text{Jewish} + \beta_8 \text{pre-war} \cdot \text{Other Ethnicity} \\ & + \beta_9 \text{war} \cdot \text{German} + \beta_{10} \text{war} \cdot \text{Jewish} + \beta_{11} \text{war} \cdot \text{Other Ethnicity} \\ & + \beta_{12} \text{Nominal} + \beta_{13} \text{Quarter Dividend Sale} + \beta_{14} \text{Committee of Admissions} + \varepsilon \end{aligned} \quad (1)$$

Regressions also control for nominal transactions, quarter dividend sales, and sales by the Committee of Admissions. Intuitively, each of these variables may affect rejection rates. First, nominal sales may be less likely to be rejected because they typically transferred seats within a firm, so that other members of the firm, who were already active at the NYSE, could vouch for the applicant. Second, the quarter dividend sale may have increased rejection rates if the sudden increase in the supply of memberships lowered the quality of marginal applicants. Third, rejection rates may be lower for sales that were administered by the Committee of Admissions if the Committee picked applicants that it preferred instead of selling to the highest bidder.

OLS estimates confirm that rejection rates for applicants with German-sounding names roughly doubled after 1914. A coefficient for *war***German* of 0.066 (Table 4, I, significant at 1%), compared with a coefficient of 0.024 for *pre-war***German* (not significant) implies an increase of 0.041 after 1914. A Wald test statistic of 3.14 confirms that this increase in rejection rates is statistically significant, with a p-value of 0.077. These results are robust to controlling for nominal sales, quarter dividend sales, sales that were administered by the Committee of Admissions, annual fixed effects, logit specifications (Table 4, II–IV, and Appendix Tables A1–4).

The data also confirm that nominal sales were less likely to be rejected, with an estimate of -0.024 (significant at 1%, Table 4, II). Applicants during the quarter dividend sale were no more likely to be rejected than other applicants, suggesting that the NYSE was able to attract large numbers of quality applicants, even as it expanded the number of seats.²⁷ Similarly, applicants in sales by the Committee of Admissions were no less likely to be rejected, indicating that the Committee sold to the highest bidder, as intended by the NYSE rules.

4.3. Time-varying coefficient estimates

Quantitative measures of ethnic preferences in Section 1 suggest that the war's effects were strongest immediately after 1914, although some effects persisted throughout the 1920s. To examine whether changes in the intensity of preferences affected admissions, regressions with time-specific treatment effects allow β_9 in Eq. (1) to vary over time; the coefficient γ_t measures changes in rejection rates and blackballs for German Americans relative to Anglo-Saxons across three-year intervals from 1911 to 1936. A placebo coefficient for the pre-war period (1911–1913) tests for a potential effect prior to World War I.

$$\begin{aligned} \text{Rejected}_t = & \beta_0 + \beta_1 \text{German} + \beta_2 \text{Jewish} + \beta_3 \text{Other Ethnicity} + \beta_4 \text{war} + \beta_5 \text{post-WWI} \\ & + \gamma_t \text{German} \cdot I(1911-1936) + \delta_t \text{German Jewish} \cdot I(1911-1936) + \varphi_t \text{Other Jewish} \cdot I(1911-1936) + \psi_t \text{Other Ethnicities} \cdot I(1911-1936) \\ & + \beta_6 \text{Nominal} + \beta_7 \text{Quarter Dividend Sale} + \beta_8 \text{Committee of Admissions} + \varepsilon \end{aligned} \quad (2)$$

where $I(1911-1936)$ is an indicator variable that equals 1 for years between 1911 and 1936. Estimates of time-specific treatment effects show that the most significant changes in admissions occurred in the late 1910s, when taste effects were most intense. Before the start of World War I, estimated "effects" are not statistically significant (Fig. 6). From 1914 to 1916 and from 1917 to 1919, German Americans were 12 and 11% more likely to be rejected, respectively, compared with Anglo-Saxons and before 1911 (significant at 1%, Fig. 6). In the same years, roughly 1.5 additional blackballs were cast on average against applicants with German-sounding names (significant at 1%, Fig. 7). Blackballs increased again after 1935 (1.4 additional blackballs, with a p-value of 0.060), two years after the Nazi party took power in Germany, but there is no significant effect on rejections.

4.4. Placebo tests for non-German minorities

Another potential concern with these tests is that the late 1910s were a period of widespread ethnic prejudice, which affected German Americans but also other ethnicities, independent of World War I. For example, anecdotal evidence suggests that Irish Americans were subject to ethnic bias throughout the 1930s.²⁸ To address this issue, placebo regressions artificially expose Irish Americans—who may be subject to discrimination overall but should not be adversely affected by the war—to a taste shock after 1914.

Such placebo regressions yield no evidence of an effect on other, non-German minorities. Coefficients for *pre-war***Irish* and *war***Irish* are not statistically significant, and there is no evidence that coefficients change after 1914. In the *war* period, applicants with Irish-sounding names were 2.3% more likely to be rejected, compared with 1.8% in the pre-war period (not statistically

²⁶ Wright (1986) and Margo (1990), for example, have documented significant labor-market discrimination against blacks, which operates mainly through exclusion (or segregation of groups into different occupations and job titles) rather than lower wages. The current study adds a complementary test for the effects of changes in tastes on a well-established European majority group.

²⁷ These results are also consistent with findings in Davis et al. (2007), which suggest that the quarter dividend sale occurred in response to an increase in the demand for trading.

²⁸ For instance, Ted Kennedy, who was born in 1932, remembered 'Help Wanted' signs which said "No Irish Need Apply" (Congressional Record Senate, September 9, 1996 p.S10054). On the contrary, many historians argue that prejudice against Irish Americans had become a myth by the early 20th century (e.g., Jensen, 2002).

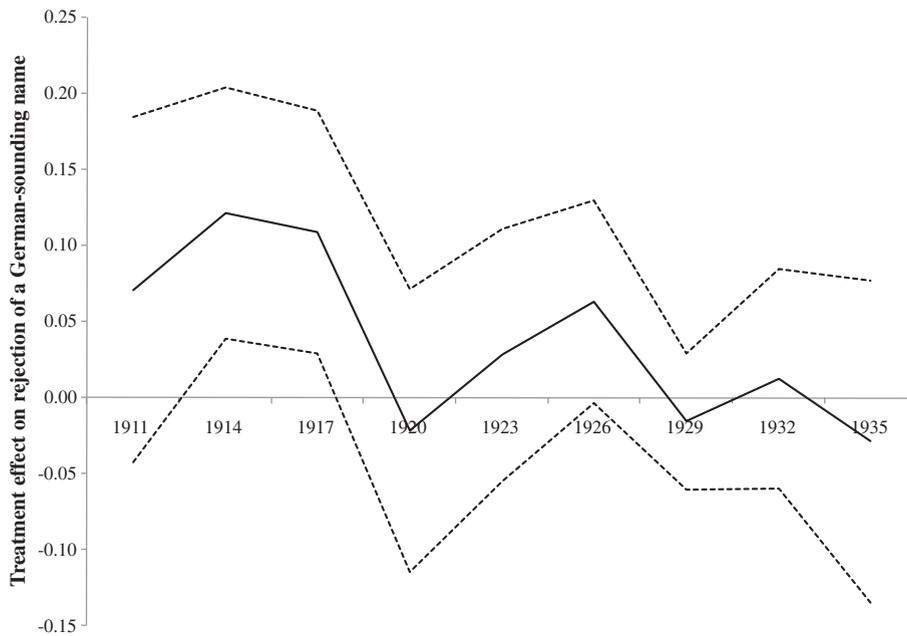


Fig. 6. Time-varying effects of having a German-sounding name on the probability of being rejected. Notes: For a 95-percent confidence interval of the OLS regression $\text{Rejected} = \beta_0 + \beta_1 \text{German} + \beta_2 \text{Jewish} + \beta_3 \text{Other Ethnicity} + \beta_4 \text{WWI} + \beta_5 \text{post-WWI} + \gamma_t \text{German} \cdot I(1911-1936) + \delta_t \text{German Jewish} \cdot I(1911-1936) + \varphi_t \text{Other Jewish} \cdot I(1911-1936) + \psi_t \text{Other Ethnicities} \cdot I(1911-1936) + \beta_6 \text{Nominal} + \beta_7 \text{Quarter Dividend Sale} + \beta_8 \text{Committee of Admissions} + \varepsilon$, which allows German Americans to be “treated” prior to 1914 to check that there was no “effect” prior to World War I. Data were collected from the NYSE Archives. Names are matched to ethnicities by a commercial algorithm that uses linguistic rules and location-specific naming practices.

significant, Table 5, II). A Wald test statistic of 0.04 fails to reject the hypothesis that coefficients for *pre-war*Irish* and *war*Irish* are equal with a p-value of 0.84. Similarly, Irish Americans received 0.407 additional blackballs in the war period, compared with 0.411 additional blackballs in the pre-war period (not statistically significant, Table 5, IV). A Wald test statistic of 0.00 fails to reject the hypothesis that coefficients for *pre-war*Irish* and *war*Irish* are equal with a p-value above 0.99. Regressions for other non-German minorities, including Italian, Russian, and Dutch Americans, yield similar results.

4.5. German Jews

In contrast to Irish Americans and other non-German minorities, Jewish applicants may have been subject to differential treatment if they had German-sounding names. This intuition is borne out in difference-in-differences tables, which do however not control for other characteristics of applications. The data also indicate that Jewish applicants were subject to bias across all years: OLS regressions of the original data, which cannot separate German from non-German Jews, imply rejection rates of 2 to 3% above those for Anglo-Saxons (coefficients of 2.4 to 2.7%, significant at 10%, Table 4, I–III).

Information from shipping records (described in the data section) makes it possible to separately estimate the potential effects of the war on German and non-German Jews. A coefficient of 0.078 for *war*German Jewish* (significant at 1%, Table 6, I) compared with a coefficient of 0.009 for *pre-war*German Jewish* (not significant) suggests that rejection rates for German Jews increased by 6.9% after 1914 relative to Anglo-Saxons. A Wald test statistic of 5.22 rejects the hypothesis that coefficients for *pre-war*German Jewish* and *war*German Jewish* are equal with a p-value of 0.022. Results are robust to controlling for nominal sales, quarter dividend sales, sales by the Committee of Admissions, annual fixed effects, and logit specifications (Table 6, II–IV, and Appendix Tables A5–8). A coefficient 0.085 for *Other Jewish* (significant at 1%, Table 6, I) indicates the presence of anti-Jewish bias across all years.

4.6. Blackballs

Regressions in Table 7 re-estimate regressions of rejection rates in Table 4, with blackballs as the dependent variable. A coefficient of 0.758 for *war*German* (Table 7, I, significant at 1%) compared with a coefficient of 0.292 for *pre-war*German* (not statistically significant) implies an increase in blackballs of 0.466 after 1914. A Wald test statistic of 2.95 rejects the hypothesis that coefficients for the war and pre-war periods are equal with a p-value of 0.08. Similarly, a coefficient of 0.798 for *war*German Jewish* (Table 7, I, significant at 5%) compared with a coefficient of 0.291 for *pre-war*German Jewish* (not significant) implies an increase in blackballs of 0.507 after 1914. A Wald test statistic of 2.13 narrowly fails to reject the hypothesis that coefficients for the war and pre-war periods are equal with a p-value of 0.14. Results are robust to controlling for nominal sales, quarter dividend sales, sales by the Committee of Admissions, and annual fixed effects (Table 7, I–III, and Appendix Tables A9–10).

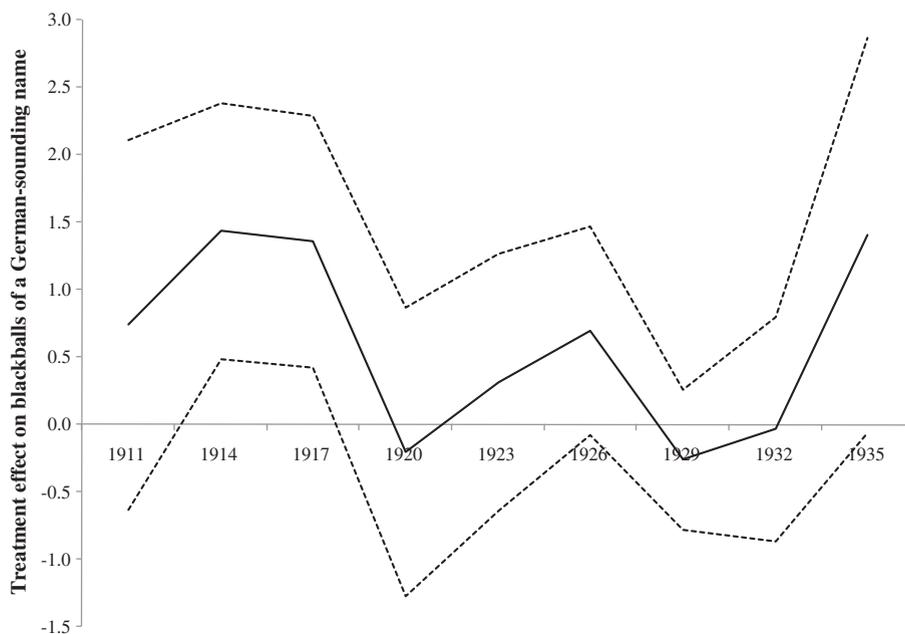


Fig. 7. Time-varying estimates of the effect of a German-sounding name on blackballs. Notes: For a 95-percent confidence interval of the OLS regression $\text{Blackballs} = \beta_0 + \beta_1 \text{German} + \beta_2 \text{Jewish} + \beta_3 \text{Other Ethnicity} + \beta_4 \text{WWI} + \beta_5 \text{post-WWI} + \gamma_t \text{German} \cdot I(1911-1936) + \delta_t \text{German Jewish} \cdot I(1911-1936) + \varphi_t \text{Other Jewish} \cdot I(1911-1936) + \psi_t \text{Other Ethnicities} \cdot I(1911-1936) + \beta_6 \text{Nominal} + \beta_7 \text{Quarter Dividend Sale} + \beta_8 \text{Committee of Admissions} + \varepsilon$, which allows German Americans to be “treated” prior to 1914 to check that there was no “effect” prior to World War I. Data on applicants’ names and on blackballs were collected from the NYSE Archives. Names are matched to ethnicities by a commercial algorithm that uses linguistic rules and location-specific naming practices.

4.7. Changes in the ethnic composition of the Committee of Admissions

In addition to influencing admissions, ethnic preferences may also have limited access to positions of influence within the NYSE. To measure these effects, an additional test examines changes over time in the ethnic composition of the Committee of Admissions. Each May, the three longest-serving members were replaced by new members (Eames, 1894, pp.74–75).

Committee data confirm that the war limited the promotion of German American traders to key positions within the Exchange. Between 1914 and 1929 no German Americans (Jewish or other Germans) were elected.²⁹ In 1880, the 15-member Committee included three German Americans and one Jewish trader (Fig. 8). Between 1913 and 1915, the number of German Americans declined to two; by 1921, only one German American remained. It took until 1930 for another German American to be elected to the Committee.

5. Archival evidence on changes in productivity after 1914

Can observed changes in admissions be explained by changes in the productivity of German American applicants without changes in tastes? For example, German Americans may have been rejected at higher rates after 1914 because they were more likely to fail in business or pose a security threat to the NYSE. Such changes in productivity are inherently difficult to observe. Census data, however, indicate that the quality of German American applicants stayed increased after 1914. Archival evidence from FBI case files and the NYSE similarly indicates that, at least within the elite group of German Americans at the NYSE, changes in productivity cannot explain changes in admissions.

5.1. No German Americans were suspected as spies by the FBI

Declassified FBI case files on pro-German activities between 1908 and 1921 include 12 references to the NYSE (Federal Bureau of Investigation, 1908–1922). In two cases existing NYSE traders were subjects of the investigation; more typically NYSE members acted as informants or as witnesses for the Bureau. The most prominent case involved Anglo-Saxon traders, who were suspected of bribing officials to protect their sons from the draft (case number 8000–217574). Another case concerned Frederick W. Pelzer, of B. H. & F. W. Pelzer, 12 Broadway, New York City (case number 123,027). Even though Pelzer was a German American, the Bureau had begun to

²⁹ Committee members were identified from the Minutes of the Committee of Admissions (1904), Eames (1894), and the New York Stock Exchange Directory (1906, 1909, 1913–15, 1920, and 1930).

Table 5
Placebo treatment of World War I on Irish Americans OLS estimates for rejections and blackballs.

	Rejected (I–II)		Blackballs (III–IV)	
	I	II	III	IV
Irish	−0.025*	−0.024*	−0.374**	−0.365**
	(0.014)	(0.014)	(0.158)	(0.158)
German	−0.018	−0.019	−0.170	−0.178
	(0.015)	(0.015)	(0.175)	(0.174)
Jewish	0.022	0.020	0.076	0.049
	(0.015)	(0.015)	(0.172)	(0.172)
Other ethnicity	0.005	0.004	0.077	0.065
	(0.010)	(0.010)	(0.119)	(0.119)
Pre-War	−0.000	−0.002	−0.148	−0.179
	(0.008)	(0.010)	(0.093)	(0.113)
Pre-War*Irish	0.018	0.018	0.423	0.411
	(0.024)	(0.024)	(0.278)	(0.277)
Pre-War*German	0.029	0.028	0.368	0.355
	(0.022)	(0.021)	(0.250)	(0.250)
Pre-War*Jewish	−0.018	−0.015	0.034	0.056
	(0.021)	(0.021)	(0.249)	(0.249)
Pre-War*Other ethnicity	−0.004	−0.004	−0.078	−0.069
	(0.014)	(0.014)	(0.165)	(0.165)
War	−0.006	−0.005	−0.159	−0.168
	(0.009)	(0.011)	(0.108)	(0.125)
War*Irish	0.025	0.023	0.432	0.407
	(0.025)	(0.025)	(0.291)	(0.291)
War*German	0.071***	0.070***	0.838***	0.829***
	(0.023)	(0.023)	(0.271)	(0.271)
War*Jewish	0.058**	0.061**	0.724***	0.746***
	(0.024)	(0.024)	(0.277)	(0.277)
War*Other ethnicity	0.023	0.022	0.190	0.187
	(0.016)	(0.016)	(0.187)	(0.187)
Nominal			−0.023***	−0.259***
			(0.007)	(0.082)
Quarter dividend sale			0.003	0.025
			(0.009)	(0.100)
Committee of Admissions			0.005	0.086
			(0.007)	(0.077)
Constant	0.030***	0.033***	0.456***	0.494***
	(0.006)	(0.008)	(0.070)	(0.098)
Observations (Applications)	5097	5097	4998	4998
R-squared	0.01	0.01	0.01	0.01

Notes: Data on the identities of applicants and admissions decisions were collected from the NYSE Archives. Blackballs are veto votes by the Committee of Admissions; the Committee has 15 members and votes when at least ten members are present. Names are matched to ethnicities by a commercial algorithm that uses linguistic rules and location-specific naming practices.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

investigate him only after he had applied for a passport to visit Cuba. After a quick background check, the Bureau dropped its investigation and recommended that Peltzer's request for a passport should be granted:

If the Department does not object to people traveling for pleasure only, there is no reason, as far as I can see, why their application for a passport should not be granted, as all information I have been able to get speaks very highly for both Mr. and Mrs. Pelzer ([Federal Bureau of Investigation, 1908–1922](#)).

Additional evidence comes from the FBI's list of "enemy alien firms." At the time, the Bureau was responsible for investigating any firms that were partially owned by "enemy persons" defined as "All persons of whatever nationality, including partnerships and corporations, residing or doing business in the territory of enemy nations, or in the territory occupied by the armed forces of the enemy" ([Alien Property Custodian 1919](#), p.7). This investigation produced a list of 286 firms with enemy interests and secured "millions of property which had been skillfully concealed by its enemy owners" ([Alien Property Custodian 1919](#), p.19). Enemy firms included two NYSE firms: William Schall & Co. (Report Number 7099, [Alien Property Custodian 1919](#), p.369) and B.F. Schwartz & Co. (Report Number 6737, [Alien Property Custodian 1919](#), p.374). William Schall had entered NYSE a quarter century before the beginning of the war on April 19, 1891. Benjamin Schwartz was unanimously accepted to the NYSE on February 6, 1919, suggesting that there were only weak links between the NYSE's voting behavior and real links to Germany.

Table 6

Separating German Jewish from other Jewish names, dependent variable is 1 for rejected applicants, 0 for accepted.

	OLS (I–III)			Logit
	I	II	III	IV
German	−0.013 (0.015)	−0.014 (0.015)	−0.014 (0.015)	−0.789 (0.740)
German Jewish	−0.015 (0.019)	−0.017 (0.019)	−0.015 (0.018)	−0.934 (1.025)
Other Jewish	0.085*** (0.021)	0.081*** (0.021)	0.082*** (0.021)	1.502*** (0.430)
Other ethnicity	0.010 (0.010)	0.009 (0.010)	0.010 (0.010)	0.340 (0.323)
Pre-war	0.004 (0.007)	0.002 (0.009)		
Pre-war*German	0.024 (0.021)	0.023 (0.021)	0.031 (0.021)	1.363 (0.872)
Pre-war*German Jewish	0.009 (0.027)	0.010 (0.027)	0.014 (0.027)	0.878 (1.268)
Pre-war*Other Jewish	−0.065** (0.032)	−0.061* (0.032)	−0.063** (0.031)	−0.989 (0.765)
Pre-war*Other ethnicity	−0.009 (0.014)	−0.008 (0.014)	−0.009 (0.014)	−0.330 (0.461)
War	−0.001 (0.009)	−0.002 (0.010)		
War*German	0.066*** (0.023)	0.065*** (0.023)	0.059** (0.023)	1.775** (0.852)
War*German Jewish	0.078*** (0.029)	0.079*** (0.029)	0.071** (0.029)	2.095* (1.137)
War*Other Jewish	0.030 (0.037)	0.034 (0.037)	0.040 (0.037)	0.580 (0.698)
War*Other ethnicity	0.018 (0.016)	0.018 (0.016)	0.015 (0.015)	0.342 (0.472)
Nominal		−0.024*** (0.007)	−0.022*** (0.007)	−1.095*** (0.353)
Quarter dividend sale		0.002 (0.009)	0.011 (0.012)	0.294 (0.413)
Committee of Admissions		0.005 (0.007)	−0.001 (0.007)	−0.042 (0.207)
Constant		0.025*** (0.005)	0.029*** (0.008)	0.028*** (0.005)
Observations (Applications)	5097	5097	5097	4653
Year fixed effect	No	No	Yes	Yes
(Pseudo) <i>R</i> -squared	0.01	0.01	0.01	0.04

Notes: German Jewish last names are identified based on the most frequent country of origin in the arrival records of ships that entered New York between 1850 and 1950. Column IV reports estimates from a logit regression with annual fixed effect; this regression drops nine years of data when no applicants were rejected.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

5.2. German Americans traders were not more likely to do foreign business

There is also no evidence that German Americans were more likely to conduct business with Europe, which would have made them more vulnerable to trade disruptions as a result of World War I. In 1911, the NYSE created the Special Committee on Foreign Business to “investigate and report upon the foreign arbitrage business and trading” (New York Stock Exchange, 1911). To ensure that its traders adhered to regulations on commissions in their foreign transactions, the Committee gathered testimony from “every firm doing a foreign business at the so-called Arbitrage Rail on the floor of the Exchange” (New York Stock Exchange, 1911).³⁰

The minutes of the Special Committee record that testimony was delivered by 37 members of the NYSE. Only four of these traders—Benjamin W. Loeb, H.P. Goldschmidt, John D. Probst, and William J. Ehrich—were German Americans. This suggests that the share of German traders among those doing foreign business at the NYSE (11.4%) was only slightly higher than the share of German traders among the general membership of the Exchange (8%, Fig. 4).

³⁰ I thank Janet Linde of the NYSE for guiding me towards the records of this Committee.

Table 7

OLS regressions, dependent variable is number of blackballs separating German Jewish from other Jewish names.

	I	II	III
German	−0.096 (0.172)	−0.107 (0.171)	−0.114 (0.171)
German Jewish	−0.293 (0.214)	−0.314 (0.214)	−0.277 (0.213)
Other Jewish	0.772*** (0.251)	0.735*** (0.251)	0.733*** (0.250)
Other ethnicity	0.150 (0.115)	0.136 (0.115)	0.155 (0.115)
Pre-war	−0.071 (0.086)	−0.116 (0.108)	− −
Pre-war*German	0.292 (0.248)	0.280 (0.247)	0.358 (0.247)
Pre-war*German Jewish	0.291 (0.315)	0.296 (0.315)	0.302 (0.314)
Pre-war*Other Jewish	−0.519 (0.366)	−0.471 (0.366)	−0.485 (0.366)
Pre-war*Other ethnicity	−0.155 (0.161)	−0.142 (0.161)	−0.161 (0.161)
War	−0.079 (0.100)	−0.103 (0.118)	
War*German	0.758*** (0.267)	0.753*** (0.267)	0.677** (0.267)
War*German Jewish	0.798*** (0.337)	0.815*** (0.336)	0.710*** (0.335)
War*Other Jewish	0.581 (0.434)	0.617 (0.434)	0.674 (0.433)
War*Other ethnicity	0.110 (0.183)	0.112 (0.183)	0.072 (0.181)
Nominal		−0.262*** (0.082)	−0.238*** (0.083)
Quarter dividend sale		0.008 (0.100)	0.212 (0.143)
Committee of Admissions		0.088 (0.077)	0.029 (0.078)
Constant	0.383*** (0.063)	0.433*** (0.093)	0.324*** (0.056)
Observations (Applications)	4998	4998	4998
Year fixed effect	No	No	Yes
R-squared	0.01	0.01	0.01

Notes: Blackballs are veto votes by the 15 members of the Committee of Admissions. Names are matched to ethnicities by a commercial algorithm. German Jewish last names are identified based on the most frequent country of origin in the arrival records of ships that entered New York between 1850 and 1950.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

5.3. No increase in business failures for traders with German-sounding names

Data on business failures, as an extreme measure of changes in profitability, also yield no evidence that differential productivity effects might explain the changes in admissions. Traders who failed in business were immediately expelled from the Exchange, and their seats were auctioned off to satisfy their creditors. Between 1915 and 1918, the number of expulsions increased from zero to seven, but only two of the expelled were German American (Fig. 9). This share is particularly low considering that changes in ethnic preferences by customers and fellow traders may have made German Americans more vulnerable to failure. In fact, a second spike in expulsions in 1922 is most likely an effect of anti-German sentiments. In that year, the NYSE witnessed six expulsions, including those of three German Americans. At the time, trading restrictions with Germany had been removed, but the war's effect on ethnic preferences continued to be substantial.

Data on voluntary exits also yield no evidence that the War lowered the productivity of traders with German-sounding names. Such data offer a less extreme measure for a potential decline in productivity, as they capture traders who voluntarily resigned from trading. Archival records indicate that spikes in German American exits occurred well before the war. In 1898, the share of German Americans among all sellers increased from less than 9 to almost 16% (Fig. 10). During World War I, there was no increase in the share of German Americans. From 1900 to 1923 the share of German American exits fluctuated around an average of 7%, roughly equal to their share of traders. The only significant increase occurred in 1924, five years after the end of the war.

In sum, archival records from the FBI and the NYSE suggest that potential changes in real or perceived productivity alone cannot explain differences in admissions. The next and final section examines whether ethnic preferences had a similar effect on the price that German Americans paid to be admitted.

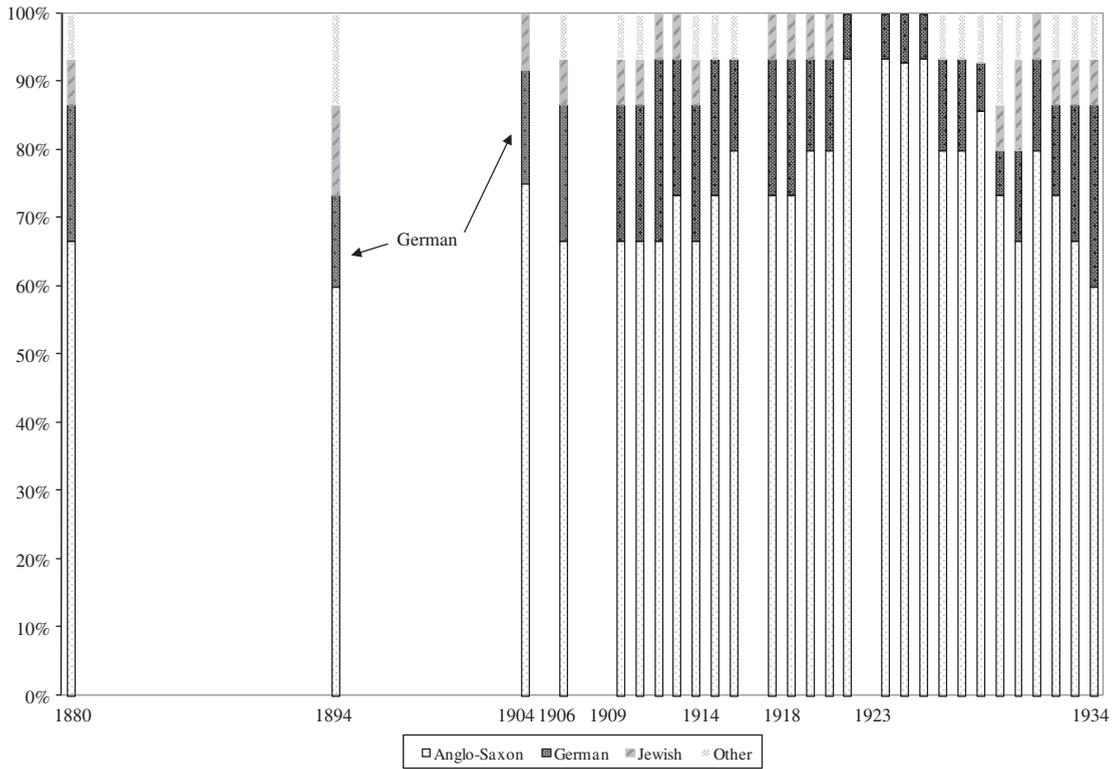


Fig. 8. Ethnic composition of the Committee of Admissions. *Notes:* The Committee of Admissions had 15 members, whose names are drawn from the *Minutes of the Committee of Admissions* (1904), *Eames* (1894), and the *NYSE Directory*. Members are matched to ethnicities by a commercial algorithm that uses linguistic rules and location-specific naming practices; this information was supplemented with information from obituaries in the *New York Times* and census records.

6. No changes in the price of admission

Although the NYSE data show that changes in tastes affected admissions decisions, it is not clear *ex ante* how changes in tastes should affect the price of NYSE seats because traders were selected by a committee of existing members who did not receive a

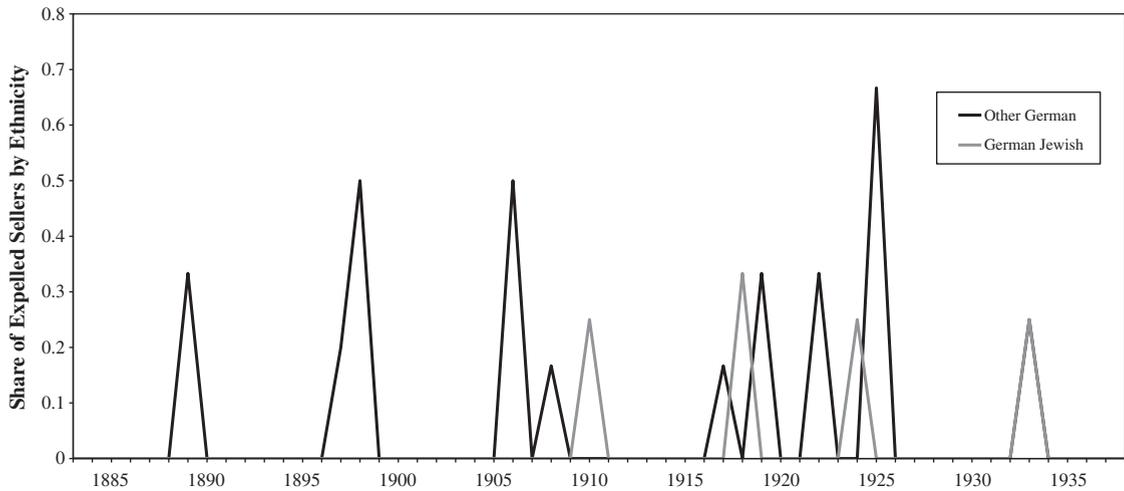


Fig. 9. Expulsions from the NYSE, 1883 to 1936. *Notes:* Names of expelled members are collected from annotations in the ledgers of transactions at the NYSE archives. German and Jewish members are identified by a commercial algorithm that uses linguistic rules and location-specific naming practices. German Jews are distinguished from other Jews using passenger lists of immigrant ships that arrived at the port of New York between 1850 and 1950 (available at ancestry.com).

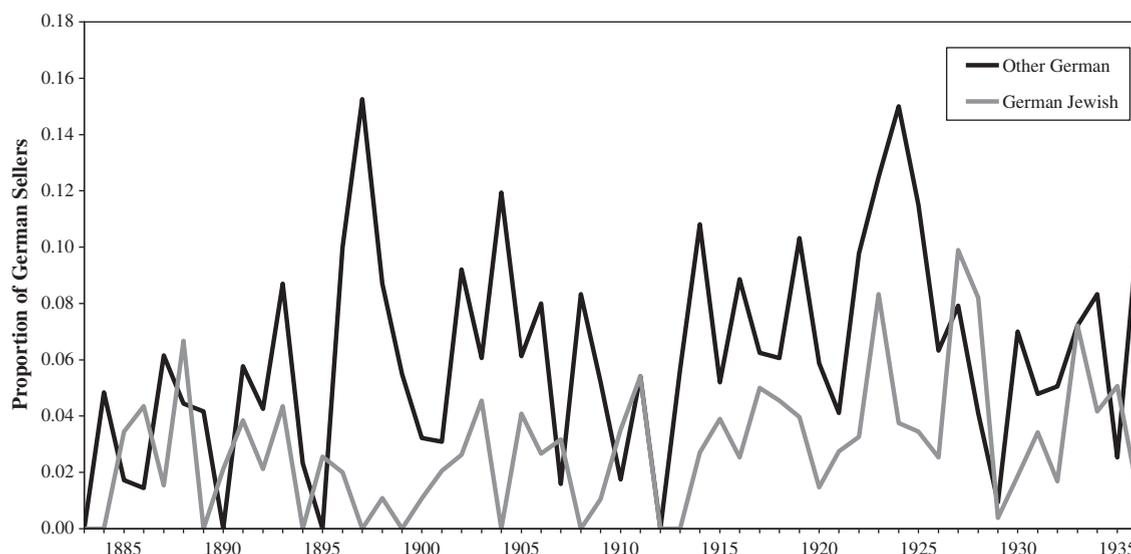


Fig. 10. Sellers of NYSE seats, 1883 to 1936. *Notes:* Sellers' names are collected from the ledgers of transactions at the NYSE archives. Sellers with German- and Jewish-sounding names are identified by a commercial algorithm that uses linguistic rules and location-specific naming practices. German Jews are distinguished from other Jews based on immigrants' countries of origins in passenger lists of ships that arrived at the port of New York between 1850 and 1950 (available at ancestry.com).

share of the purchase price, and could therefore not be compensated through a higher price. Applicants may, however, still have paid higher prices to compensate sellers (rather than their future colleagues), despite the brevity of their interactions.³¹

To measure a potential effect on price, regressions in Table 8 replicate regressions for rejection rates with price as the dependent variable. Annual fixed effects control for the effects that changes in stock market conditions over time have on seat prices (Schwert, 1977; Keim and Madhavan, 2000).³²

$$\begin{aligned} \ln(\text{Price})_t = & \beta_{0t} + \beta_1 \text{German} + \beta_2 \text{Jewish} + \beta_3 \text{Other Ethnicity} + \beta_4 \text{pre-war German} \\ & + \beta_5 \text{pre-war Jewish} + \beta_6 \text{pre-war Other Ethnicity} \\ & + \beta_7 \text{war German} + \beta_8 \text{war Jewish} + \beta_9 \text{war Other Ethnicity} \\ & + \beta_{10} \text{Nominal} + \beta_{11} \text{Quarter Dividend Sale} + \beta_{12} \text{Committee of Admissions} \\ & + \beta_{13} \text{Same Ethnicity} + \varepsilon \end{aligned} \quad (3)$$

In price regressions, coefficient estimates for *pre-war*German* and *war*German* are nearly identical. A Wald test statistic of 0.04 fails to reject the hypothesis that a coefficient of 0.001 for *pre-war*German* (Table 8, I, not significant) is equal to a coefficient of 0.003 for *war*German* (not significant) with a p-value of 0.85. Similarly, a Wald test statistic of 0.25 fails to reject the hypothesis that a coefficient of 0.066 for *war*German Jewish* (Table 8, III, significant at 1%) is equal to a coefficient of 0.053 for *pre-war*German Jewish* (significant at 5%) with a p-value of 0.61.

Among the control variables, the most significant effect occurs for quarter dividend sales, when applicants had to negotiate with four sellers rather than one to purchase a seat suggesting that transaction costs increased the price of seats during the quarter dividend sale. By comparison, buying a seat from the Committee of Admissions (Table 8, III–IV) or from a member of the same ethnicity (Table 8 IV) had no measurable effects on price.³³

7. Conclusions

Quantitative measures of ethnic preferences based on German-language operas, children's first names, and food purchases establish that World War I resulted in a strong and persistent shift in ethnic preferences, which effectively switched the status of German Americans from a well-established majority group to an ethnic minority until the late 1920s. This paper has analyzed a new data set on more than 5000 applicants to the NYSE to test whether this shift in preferences affected applicants with German-sounding names in an elite and financially sophisticated professional setting, where one would least expect discrimination. Admissions data indicate that changes in preferences doubled the likelihood that applicants with German-sounding names would be rejected (relative to Anglo-Saxons).

³¹ Car dealers, for example, have been shown to quote higher prices to minority buyers (Ayres and Siegelman, 1995).

³² Regressions with time period dummies are reported in Appendix A12 and A14.

³³ Same ethnicity interactions check for homophily or "love of the same" (e.g., McPherson et al., 2001).

Table 8

OLS with annual fixed effects, dependent variable is log price of seat in year 2005 US dollars.

	I	II	III	IV
German	0.003 (0.013)	0.001 (0.013)	0.001 (0.013)	0.001 (0.014)
German Jewish	−0.040** (0.016)	−0.043*** (0.016)	−0.043*** (0.016)	−0.041** (0.017)
Other Jewish	0.009 (0.018)	−0.001 (0.018)	−0.001 (0.018)	0.000 (0.018)
Other ethnicity	0.025*** (0.009)	0.025*** (0.009)	0.025*** (0.009)	0.027*** (0.009)
Pre-War*German	0.001 (0.018)	0.003 (0.018)	0.003 (0.018)	0.004 (0.018)
Pre-War*German Jewish	0.051** (0.023)	0.054** (0.023)	0.053** (0.023)	0.054** (0.023)
Pre-War*Other Jewish	−0.023 (0.027)	−0.012 (0.027)	−0.012 (0.027)	−0.011 (0.027)
Pre-War*Other ethnicity	−0.017 (0.012)	−0.017 (0.012)	−0.017 (0.012)	−0.017 (0.012)
War*German	0.003 (0.020)	0.007 (0.020)	0.007 (0.020)	0.005 (0.021)
War*German Jewish	0.060** (0.025)	0.066*** (0.025)	0.066*** (0.025)	0.066*** (0.025)
War*Other Jewish	0.037 (0.032)	0.055* (0.032)	0.055* (0.032)	0.055* (0.032)
War*Other ethnicity	−0.018 (0.014)	−0.016 (0.014)	−0.016 (0.014)	−0.016 (0.014)
Quarter dividend sale		0.092*** (0.011)	0.092*** (0.011)	0.092*** (0.011)
Committee of Admissions			0.001 (0.006)	0.001 (0.006)
German buyer and seller*War				0.020 (0.053)
Constant	13.964*** (0.003)	13.943*** (0.004)	13.943*** (0.004)	13.940*** (0.006)
Same ethnicity interactions	No	No	No	Yes
Observations (Applications)	4210	4210	4210	4210
R-squared (within)	0.01	0.02	0.02	0.02

Notes: Data on the identities of applicants and admissions decisions were collected from the NYSE Archives. Names are matched to ethnicities by a commercial algorithm; German Jewish last names are identified based on the most frequent country of origin in the arrival records of ships that entered New York between 1850 and 1950. During the quarter dividend sale, each existing member received one additional quarter of a membership which he could sell to a new applicant. These applications are treated as four separate transactions because they involved different sellers and prices. Prices for these transactions are multiplied by a factor of four.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

Although these results are based on a relatively small number of German and Jewish applicants after 1914, they may, in fact, understate the real effects of discrimination if expectations of discrimination discouraged lower quality applicants with German-sounding names. Goldin and Rouse (2000), for example, find that expectations of discrimination discourage lower quality female applicants from auditioning to play in major U.S. orchestras. A similar mechanism may have discouraged lower quality applicants with German-sounding names from applying to trade at the NYSE. Consistent with this idea, census records indicate that applicants with German-sounding names had more work experience and were less “German” after 1914.

The experience of the NYSE also suggests that the mechanisms by which applicants are selected may help to perpetuate discrimination at the highest levels of professional jobs. Similar to the application processes of modern-day professional firms NYSE traders were selected by prospective co-workers, independently of the price that they were willing to pay for a seat. Consistent with this separation, admissions data yield no evidence of differential effects on the price of admissions for German Americans, even though the probability of admissions declined. This suggests that—in environments where decisions on admissions are made separately from decisions on price—market mechanisms may fail to eliminate discrimination.³⁴

The findings of this paper also suggest that news of atrocities that become associated with a specific ethnic group, such as the attacks of September 11th, create broad-based and persistent shifts in ethnic preferences. In recent history, such shifts have triggered significant effects on trade after the cooling of French-American relations in 2002 (Michaels and Zhi, 2010), and influenced

³⁴ Condo sales are another setting where the separation of decisions on price and on admissions may obstruct the entry of minorities: Prospective buyers negotiate a sales price directly with a current owner, but sales are conditional on the approval of a co-op board, which represents the interests of other owners, who do not benefit directly if minority buyers offer a higher price.

judicial outcomes in small claims courts in response to terrorism during the Arab-Israeli war (Shayo and Zussman, 2011). Such shifts can occur spontaneously or they may be amplified for political reasons to strengthen loyalties within groups. For example, Edward Glaeser's (2005) model of the "Political Economy of Hatred" predicts that candidates on both ends of the political spectrum benefit from spreading stories that provoke hatred against minorities.³⁵ Historical evidence from the NYSE indicates that such changes in preferences affect all individuals that share the offenders' ethnicity—even if they are only related through the ethnic connotation of a name—and impact labor market outcomes at the highest levels of professional jobs.

Supplementary materials related to this article can be found online at [doi:10.1016/j.eeh.2011.12.003](https://doi.org/10.1016/j.eeh.2011.12.003).

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³⁵ Candidates who favor redistribution spread stories that create hatred against rich minorities, while candidates who oppose redistribution spread hatred against poor minorities. Hatred declines with the private incentive to learn the truth, consistent with the result that NYSE sellers do not offer discounts to non-minority buyers.

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