NBER WORKING PAPER SERIES

# CURRENCY WARS AND TRADE

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Working Paper 33313
http://www.nber.org/papers/w33313

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 2024

Mitchener thanks the Center for Advanced Studies of Behavioral Sciences for generous support in 2021-22 and Santa Clara University's Leavey School of Business for research support. We are grateful to Kevin O'Rourke for sharing data and for valuable feedback on the project and Maggie Brick for excellent research assistance. We also thank Dennis Novy, Paul Bouscasse, Alan de Bromhead, James Fenske, and conference and seminar participants at LSE, Harvard (PEIF), UC Davis, Bayreuth, Mannheim, CEPR (Geneva), and the World Cliometric Conference for helpful comments and suggestions. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 33313
December 2024
JEL No. F13, F14, F33, F42, N10, N70

## ABSTRACT

The Great Depression is the canonical case of a widespread currency war, with more than 70 countries devaluing their currencies relative to gold between 1929 and 1936. What were the currency war's effects on trade flows? We use newly-compiled, high-frequency bilateral trade data and gravity models that account for when and whether trade partners had devalued to identify the effects of the currency war on global trade. Our empirical estimates show that a country's trade was reduced by more than 21% following devaluation. This negative and statistically significant decline in trade suggests that the currency war destroyed the trade-enhancing benefits of the global monetary standard, ending regime coordination and increasing trade costs.

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## I Introduction

It has long been the view of policy makers that currencies can be weaponized, manipulated to boost exports or restrict imports. The fear in pursuing these policies is that other countries may retaliate in like fashion, triggering a currency war. Concerns about "currency wars" surfaced in the wake of the Global Financial Crisis, when many economies were grappling with economic downturns and searching for policy responses. In 2010, Guido Mantega, then Finance Minister of Brazil, suggested that the global economy was "in the midst of an international currency war, a general weakening of currency," and complained that the trend towards lower interest rates depreciating advanced-economy currencies "threatens us because it takes away our competitiveness."[1] These debates continued into the 2010s with advanced-economy politicians, such as U.S. President Trump, returning fire against a number of countries, including Brazil and Argentina, for allegedly using their currency values as weapons and "devaluing" them "to take unfair advantage of the United States."[2] Concerns about currency wars have resurfaced toward the end of 2024 as a possible policy response to higher import tariffs threatened by incoming US President Trump.[3]

Domestic policymakers may surmise that the benefits of devaluation outweigh the costs, believing the latter to be borne by its trade partners. However, that conclusion depends on whether trade partners respond by also weaponizing their currencies. Retaliatory devaluations have the potential to provoke a widespread currency war, which could increase trade costs and reduce trade flows. Given that the size (number of combatants) and scope (the tools used to alter currency values) are unknown at a currency war's outset, domestic policymakers could underestimate the potential costs from unilateral devaluations. These could include disruptions in domestic trade due to exchange-rate policy uncertainty and exchange-rate volatility as well as a reduced scope for responding to global economic downturns through policy coordination, such as a coordinated expansion of monetary policy or a coordinated devaluation. A key empirical question, then, is

[1] John Authors, "Trump Doesn't Understand Currency Wars, Either," December 2, 2019, *Bloomberg Online*, https://www.bloomberg.com/opinion/articles/2019-12-02/trump-brazil-argentina-tariffs-over-currencies-are-misguided#xj4y7vzkg

[2] "Donald Trump threatens to put tariffs on Chinese products – video," *The Guardian Online* (source Reuters), August 24, 2016, www.theguardian.com/us-news/video/2016/aug/24/trump-tarrifs-china-economy-video.

[3] After Trump's Tariff Threat, Is a China Currency War Next? *The New York Times*, November 26, 2024, https://www.nytimes.com/2024/11/26/business/trump-tariffs-us-china-currency.html?smid=nytcore-ios-share&referringSource=articleShare

whether currency wars disrupt trade flows and whether that effect is quantitatively significant.

To shed light on this question, we need a setting and empirical methodology that can overcome several challenges to estimation. An ideal setting for understanding the effects of currency wars on trade flows is one where the number of combatants is large so that the effects can be precisely estimated. However, because domestic policymakers may be more likely to respond to trade-partner devaluations with devaulations of their own when their economies are experiencing negative demand shocks, we need an estimation strategy that can account for the fall in trade arising from declining domestic aggregate demand. Moreover, in addition to devaluations, countries often pursue domestic policy actions in response to recessions or negative demand shocks, so the empirical methodology also needs to control for these potential confounders. Finally, finding an empirical setting where countries devalue exchange rates rather than conduct unusual monetary policy allows for cleaner identification since no additional assumptions about pass through from interest rates to exchange rates are needed.

This paper aims to address these challenges by examining how bilateral trade flows responded to the full-fledged currency war of the early 1930s – when more than 70 countries devalued. We use theoretically-grounded gravity models to account for factors, such as distance and contiguity, which lead to more or less trade between countries over time. And, we include a full set of exporter-time and importer-time fixed effects to account for both the general decline in trade in the 1930s (e.g., that driven by falling aggregate demand) as well as domestic policies that were enacted to offset the effects of the that decline, such as across-the-board increases in tariff and non-tariff barriers to trade. To estimate the effects on trade flows, we utilize a recently-assembled database, spanning 1925-1938, which contains more than 105,000 observations of bilateral trade for 99 economies and that encompasses roughly 90% of global trade at the time. A key feature of this database is its quarterly frequency, which allows for more precise estimation of the effects of devaluation on a country's trade flows during the 1930s.

As our empirical setting illustrates, recent concerns about currency wars are not new. Indeed, given its scope, the currency war of the early 1930s may be the canonical case. That said, there is little existing research examining how it affected global trade flows. Our baseline PPML results

show that, on average, bilateral trade between country pairs where at least one trade partner devalued, declined by 21%, relative to pairs where both trade partners remained on gold. This negative effect is statistically significant and robust to the inclusion of a number of other pairwise, time-varying factors, such as an economy entering into the British imperial preference system, being part of the Reichsmark or Gold Bloc, being a participant in the Smoot-Hawley trade war, or experiencing a banking crisis. For a limited set of countries, we then extend our results to a general equilibrium (GE) framework. GE trade effects are somewhat smaller than the partial equilibrium results, with trade declining by 12.4% on average for countries that devalue, versus 4.2% on average for non-devaluers, but this is consistent with the GE estimation including many influences that may go in the opposite direction of the devaluation's effect on bilateral trade flows.

Policy makers and economists of that earlier era of fixed exchange rates commented on the potential harm arising from widespread and uncoordinated devaluations, driven by central banks and national treasuries pursuing their own objectives — just as it has been alleged today (Robinson 1937; Nurkse 1944). French Premier, Edouard Daladier, believed that self-interested devaluations were so destructive that he advocated for "an end to the currency war" even before global deflation, declining production, and other issues of recovery were addressed.[4] They were also clearly aware of the gold standard system's benefits, which included regime coordination, exchange-rate stability, and a multilateral payments system that reduced trade frictions and costs. Of course, economists of that earlier era lacked the empirical methods and comprehensive data we employ, but their debates (Nurkse 1944; Harris 1936) as well as more recent research provide a number of reasons why a currency war could generate trade costs and reduce trade, including the end of regime coordination, exchange-rate policy uncertainty, trade diversion away from first-best trade partners, and exchange-rate volatility. Our findings suggest that, just as joining the classical gold standard has been viewed as an institutional arrangement that increased trade during the first era of globalization by creating a multilateral payments system with gold convertibility and "network effects" (Lopez-Cordova and Meissner 2003; Estevadeordal, Frantz, and Taylor 2003), the reverse may also be true: the currency war of the 1930s led to the dissolution of the interwar gold standard

[4]League of Nations (1933), no.4, p.12.

and reduced trade.

In Sections II and III, we briefly describe the related literature and the historical context in which the currency war of the 1930s erupted. Sections IV-VIII describe our data, present and discuss our main findings, and provide robustness checks. Section IX discusses the trade effects in a general equilibrium setting, section X concludes.

## II Related Literature

The devaluations of the 1930s have certainly received attention from scholars. For example, research has suggested that the date of a country's devaluation is linked to a domestic recovery in prices, wages, and industrial production (Eichengreen and Sachs 1985; Campa 1990). More recently, Candia and Pedemonte (2021) examine U.S. cities and find that those with more production exposure to the U.S. devaluation in 1933 recovered more quickly from the Great Depression. However, quantitative estimates demonstrating the impact of the currency war on bilateral trade of the 1930s do not exist. This observation is surprising since the devaluations collectively had the effect of destroying the trade-enhancing effects of an international system of fixed exchange rates.

Eichengreen and Sachs (1985, p.945) conjecture that the wave of devaluations may have "had a depressing effect on trade," but they do not formally test for the average effects of trade flows. Instead, their argument and analysis (as well as more recent treatments, such as Bouscasse (2022) focus on the domestic or within-country effects of a devaluation – what is commonly referred to as they beggar-thy-neighbor effects.[5] These studies, for example, examine how the devaluations of the 1930s impacted the recovery of domestic output and prices.[6]

In contrast to this literature, we measure the differential impact of devaluation on bilateral trade flows, relative to trade pairs that have not (yet) devalued. We leverage differences in the timing of devaluations to study the trade of belligerents in the currency war. For a given trade pair,

[5] In terms of trade effects, it is often assumed that a small number of countries employ policies that are beggar-thy-neighbor, creating fertile ground for zero sum devaluations (Caballero, Farhi, and Gourinchas 2021). In this setting, depreciation is expected to reduce imports from non-devaluers and boost exports to them, thus improving bilateral trade balances and aggregate demand in those countries devaluing at the expense of those not doing so. For a model that delivers the opposite result of a devaluation's effects on domestic demand and output, see Krugman and Taylor (1978).

[6] Our paper also does not explore how output co-movements may have changed, which has been discussed in Choudhri and Kochin (1980) and Mathy and Meissner (2011).

we define entry into the trade war as the devaluation of at least one trade partner, and measure its effect on the bilateral trade flow for a given pair. To be clear, it may be the case that devaluations affect domestic macro variables, and that devaluations can be stimulative domestically (e.g., by raises prices and incomes, especially when labor is idle), but these types of domestic or "beggar-thy-neighbor" effects of devaluations are not our focus and are thus controlled for using exporter-time and importer-time fixed effects (i.e., the average effect of a devaluation on a single country's trade is swept up by the inclusion of these fixed effects). The inclusion of exporter-time, importer-time and pair fixed effects alongside pair-specific time-varying control variables also allows us to focus exclusively on the devaluations while controlling for alternative policy options that countries may have used in response to the Great Depression, such as exchange controls, tariffs, and non-tariff trade barriers as well as their existing trade or currency arrangements (Eichengreen and Irwin 2010; Ritschl and Wolf 2011). Instead, our paper fills a lacuna in the literature: measuring how the mother of all currency wars affected average global trade flows.

Our paper is related to Estevadeordal, Frantz, and Taylor (2003), which estimates gravity equations using pooled annual data for three years: 1913, 1928, and 1938. They attribute part of the collapse in global trade between 1928 and 1938 to the end of the interwar gold standard. Our paper expands on this research in that we zoom in on the massive currency war of the first half of the 1930s to assess its contemporaneous effects on global trade – including during a period when global trade was still declining precipitously. Our panel analysis differs from their cross-sectional examination of 1928 and 1938 – when global trade flows had already begun to recover and the interwar gold standard had collapsed many years prior. Our methodological approach differs from this earlier research in several ways. First, and importantly, we estimate panel gravity models that include all the fixed effects required by modern theory rather than the country fixed effects used in Estevadeordal, Frantz, and Taylor (2003). Second, to account for missing trade, our estimation strategy is based on PPML rather than OLS (Santos Silva and Tenreyro 2006). Third, we use quarterly data rather than annual data, so that we can identify the contemporaneous impact of the devaluations themselves on trade flows – again, an issue not evaluated in Estevadeordal, Frantz, and Taylor (2003) but central to the more general question of how currency wars impact trade.

Our paper also relates to researchers' renewed interest in understanding currency wars, including recent theoretical work exploring spillovers and the scope for international cooperation (Korinek 2017). However, the international context (a disintegrating global system of fixed exchange rates versus countries with interest-rate targets and floating, market-determined rates) and the policy objectives and tools at the heart of currency movements (external balance and exchange-rate pegs versus internal balance and monetary policy) were very different in the 1930s than today. Thus, while our identification strategy is similar to Rose (2021) in that it measures the effects on combatants of a currency war in order to make causal claims about trade flows, our setting and contribution differ. First, our empirical setting allows us to provide measures of the direct effects of devaluations on trade rather than the indirect effects operating through unconventional monetary policy measured in Rose's examination of recent trade. That is, in our setting, monetary warfare takes the form of devaluations during an era of fixed exchange rates. Second, the scale of the 1930s currency war relative to the 2010s was much larger, with more than half the sovereigns in our sample eventually devaluing, and inducing more exchange-rate volatility in its wake. Third, and also related to the larger reported estimates for the 1930s, we focus on a currency war that had an important institutional consequences: the dissolution of an international monetary system and the uncertainty in exchange-rate policy that followed. The collapse of the interwar gold standard that resulted from the currency war also relates to the literature on the benefits of fixed-exchange-rate regimes on trade (see, for example, Klein and Shambaugh (2006), Lee and Shin (2004), and Lopez-Cordova and Meissner (2003)). Our perspective, of course, differs in that we are able to assess their benefits "in reverse." It has been been suggested that if all modern pegs were abandoned simultaneously, it would substantially reduce global trade (Klein and Shambaugh 2006): we provide a direct test of this conjecture by looking at the effects of the roughly 70 devaluations of the 1930s – a group of countries that constituted 74% of global exports in 1929.

## III Historical Context

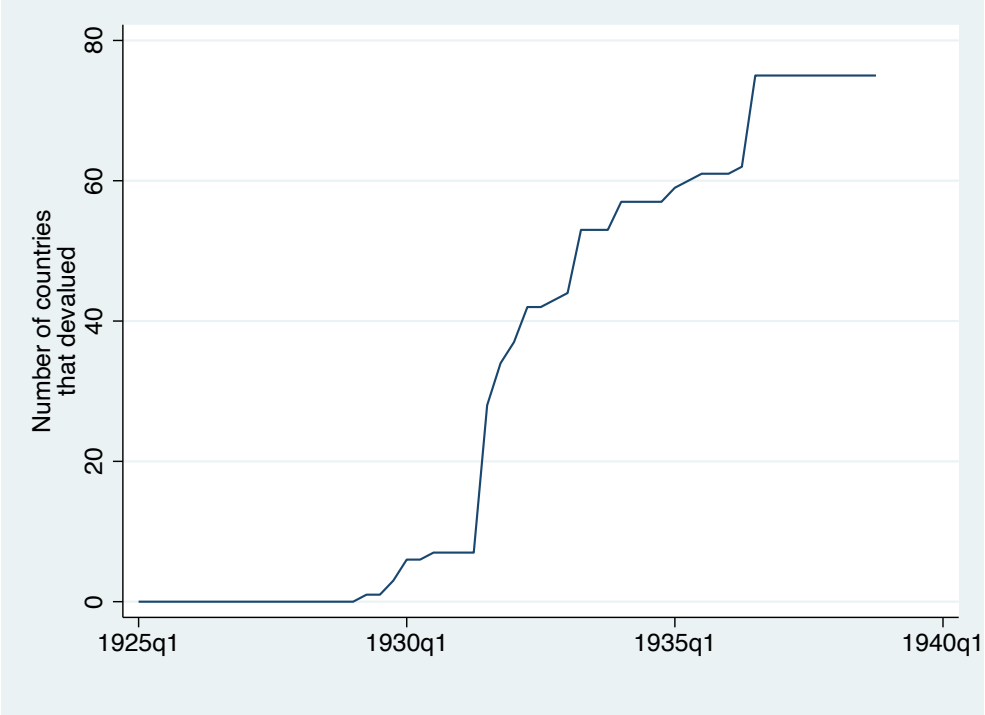
From 1929 to 1936, more than 70 economies devalued their currencies. The first ones to leave the interwar gold standard and devalue were primary-product producers, such as Argentina, Brazil, Paraguay, and Uruguay (Appendix Table ), which faced declining exports between 1928-29 (Kindleberger 1986, p.189). Australia and New Zealand followed suit in the first quarter of 1930. A number of devaluations occurred shortly after the United Kingdom devalued in September 1931 and included: those sharing a common currency with the UK (the Irish Free State); many but not all members of the British Commonwealth (famously, South Africa waited for over a year before devaluing); and countries whose trade tied them particularly to the British economy (notably the Nordic countries). Japan left gold at the end of the 1931. A steady stream of countries abandoned their prewar gold pegs between the end of 1931 and 1933, culminating in the U.S.'s departure in April 1933. The U.S. was joined by central American countries, such as Guatemala, Honduras and Panama. Other economies, notably the members of the Gold Bloc (France, Switzerland, Belgium, the Netherlands, Poland and Italy) remained on gold for several more years, while some (e.g., Germany) never formally departed gold, instead taking alternative measures (such as imposing capital controls and forming trade blocs) to restrict gold outflows. There was thus considerable variation in the timing of countries' decisions to devalue, which our empirical exercises will utilize.

Figure 1 displays the variation in the timing of devaluation in two dimensions. The top panel indicates the cumulative number of devaluations, and shows that the first significant wave of devaluations took place in third quarter of 1931 – related to the departure of the British pound sterling. A second bump occurred in 1933, when the US left the gold standard. A third group of countries left the gold bloc in 1936. By that year, more than 70 economies had devalued. As noted in the introduction, the number of devaluing economies or "combatants" is far more than the currency war of the 2010s – and provides a key aspect of the empirical setting that is of interest to those wanting to understand the average effects of currency wars on global trade.[7]

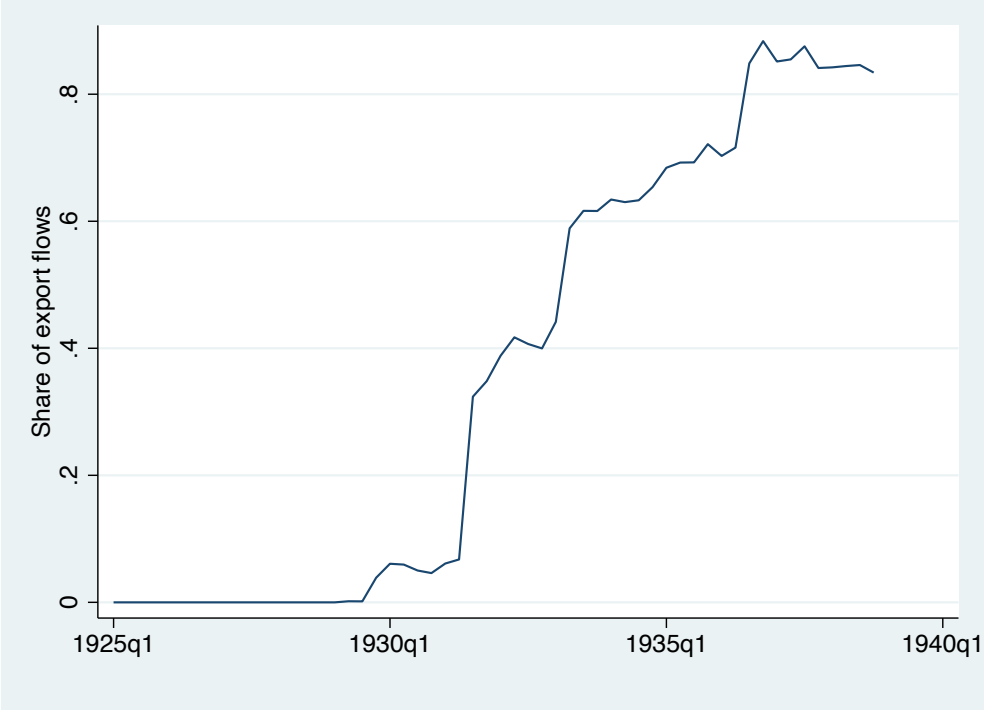
Comparing the number of countries devaluing with the share of exports originating from them,

[7]By contrast, in terms of the impact on trade flows, Rose (2021) states that unconventional monetary policy, the policy tool for the recent currency war, affected only 4.7% of trade pairs. For the 1930s, our sample period, 80% of trade pairs were eventually affected by devaluations.

Figure 1: Number of countries that have devalued (cumulative) and percentage of exports




(a) Number of countries (cumulative)




(b) Percentage of export flows

Note: Authors' calculations using data described in the text.

the bottom panel of Figure 1 shows that after Britain and the Sterling Area devalued, about 40% of trade flows were coming from countries that had already abandoned their pre-1929 pegs to gold. This share increased to 60% after the US devalued and to over 80% once the Gold Bloc countries devalued.

## IV Definitions and Data

To identify the effect of devaluation on trade flows, we generate two indicator variables: $Devalue_{i,t}$ is a dummy variable that is equal to 1 in the quarter $t$ when country $i$ devalues and remains so thereafter; it is zero otherwise. $OnGold_{j,t}$ is a second dummy variable that is equal to one while country $j$ is on gold, but switches to zero if country $j$ devalues in quarter $t$; it remains zero thereafter.[8]

Table 1: Treatment

| | $OnGold_{j,t}$ | $Devalue_{j,t}$ |
|---|---|---|
| $OnGold_{i,t}$ | (0,0) | (0,1) |
| $Devalue_{i,t}$ | (1,0) | (1,1) |

For any given country pair $i, j$ in our sample, Table 1 describes all possible devaluation combinations for pair $i, j$ as of quarter $t$. For example, the upper left and lower right quadrants of the table respectively show states of the world when neither countries $i, j$ have devalued or both $i$ and $j$ have devalued as of time $t$. Our treatment dummy (when a trade pair is engaged in a currency war) is equal to one when either one or both countries $i$ and $j$ have devalued, equivalent to the lower three quadrants in Table 1. By construction, we thus measure the effect of the devaluation of one or both trade partners in a pair relative to both trade partners being on gold. The main advantage of defining treatment in this way is that it provides a consistent reference group for comparison as time elapses (comparing observations for $i$ and $j$ to when both are on gold). Additionally, because the estimation of the gravity equation includes exporter-time, importer-time, and pair

[8]Due to the nature of the published trade data, a few countries are combined in the analysis since their trade is reported jointly (e.g., Belgium and Luxembourg). For any country pair, we coded the first devaluation as the relevant devaluation for our analysis. Our results are not sensitive to the inclusion of these combined country groups.

fixed effects (see equation 1), the identification of more than one dummy variable in this setting (e.g., the differential impact of one or both trade partners devaluing) is not possible. As Hornok (2012) shows, several heterogeneous treatment dummies cannot be identified, since including the exporter-time, importer-time fixed effects leaves too little variation in the data and additional estimates degenerate to simple transformations of the originally estimated parameter. That is, including a full set of fixed effects to account for multilateral resistance as well as time-varying domestic policies means that, in our setting, it is not possible to identify separate effects for one country in a given trade pair devaluing versus both countries devaluing.

Appendix Figure A.1 shows the number of country pairs and the share of trade flows in our estimation that are affected by this treatment over time, i.e., where either the exporter or the importer has devalued. The figure shows a large share of country pairs entering treatment in the latter half of 1931 following the first big wave of devaluations. In terms of trade flows, we see in Figure A.1b that the share of global trade affected by treatment follows the same pattern. At the height of the devaluations, roughly over 80% of world trade flows in our sample were affected.

In order to estimate the impact of devaluation on trade with non-devaluers, bilateral trade data need to be of sufficiently high frequency that we can utilize the timing of devaluations to identify their impact. To this end, we draw on our recently-assembled quarterly dataset of bilateral trade flows between 1925 and 1938, involving 99 economies (including 59 sovereign countries). Details of the construction of the data are described in detail in Mitchener, O'Rourke, and Wandschneider (2022). When building our dataset, we adhere to the methods and best practices for gravity data detailed in Head, Mayer, and Ries (2010) whenever feasible. The unbalanced panel contains 105,922 raw observations on the value of bilateral trade flows. Where necessary, we take advantage of "duplicate" observations (i.e., the fact that exports from country i to country j can also be represented as imports into country j from country i) to obtain the largest possible number of bilateral pairs and to check the reliability of our quarterly data. The country sample is based on the availability of high-frequency bilateral data from domestic sources. In total and for 1928 (just prior to the onset of devaluations), our data account for 29,927 million USD of total exports for all the economies in our sample. According to the League of Nations (1930), total global exports

stood at 32,499 million USD in 1928, so our data represent 92% of world exports measured in the year prior to the first devaluation.

We then combine the bilateral trade flows with information on devaluations. Devaluation dates are from the League of Nations (1937) and are displayed in Appendix Table A.1 alongside other scholars' coding of when countries left the gold standard. Although devaluing implied leaving the gold standard, the reverse was not necessarily the case since restricting gold exports or halting the convertibility of gold were inconsistent with the classical definition of gold standard membership but did not always coincide with devaluation. For example, Bulgaria, Germany, Hungary, and Lithuania all imposed exchange controls while retaining a formal link to gold at an unchanged parity. In this paper, we are interested in identifying the trade effects of devaluation, so we focus on the timing of that policy decision rather than on the dates when countries left gold (itself an occasionally ambiguous concept, as emphasized by Ellison, Lee, and O'Rourke (2024) and others). For our baseline estimation, we combine these data with data on trade and currency blocs, trade agreements, and specific trade policy, as described in the discussion of controls and robustness checks below.

## V Estimation

We now turn to estimating the effects of devaluations on trade flows. Our baseline empirical results estimate the following equation:

$$\ln X_{ijt} = \alpha + \beta\, Treatment_{ijt} + \gamma\, Controls_{ijt} + \delta_{it} + \delta_{jt} + \delta_{ij} + \epsilon_{ijt}\,, \tag{1}$$

where $X_{ijt}$ represents nominal trade flows from $i$ to $j$ in period $t$; $\delta_{it}$ is a series of time-varying exporter fixed effects accounting for anything systematically raising or lowering exports from $i$ over time; $\delta_{jt}$ is a series of time-varying importer fixed effects accounting for anything systematically raising or lowering imports from country $j$ over time (e.g., changes in tariffs or quotas directed against all trade partners or domestic policies aimed at combating the Depression); and $\delta_{ij}$ is a series of pair fixed effects, accounting for any pairwise, time-invariant factors influencing trade between $i$ and $j$ (e.g., distance). Pairwise fixed effects also account for the substitutability in

exports and imports between two trade partners. Controlling for this may be important because the degree to which expenditure switching occurs may depend on whether the tradables of the two countries are close substitutes (Haberis and Lipinska 2020).

The key coefficient of interest is $\beta$, the effect of devaluation on trade flows. Again, based on the definitions in Section IV, $\beta$ measures the impact on trade flows from $i$ to $j$ of a devaluation of either $i$, $j$, or both trade partners, compared to the period when both trade partners were on gold.

Equation 1 also includes time-varying, pairwise control variables ($Controls_{ijt}$), which capture institutional features that also may have influenced trade flows during the interwar period. These include whether both economies in a bilateral trade pair were part of the Sterling Area, Reichsmark Bloc, Gold Bloc or Imperial Preference system; whether countries had signed a reciprocal trade act with the United States in 1934 or subsequently (RTAA); or whether two countries in a pair were simultaneously experiencing a banking crisis in quarter $t$. We also include variables that control for all known instances where trade policy was targeted at specific countries. For example, we code whether at least one economy in a given bilateral trade pair was involved in the Smoot-Hawley Trade War, the Anglo-Irish Trade War, the German-Polish Trade War, or enforced the League of Nations sanctions against Italy.

## VI Baseline Results

The first two columns of Table 2 display estimates of equation 1 using Poisson pseudo-maximum likelihood (PPML) (following Santos Silva and Tenreyro (2006)), for all quarterly observations in our data set. Column 1 displays a simple specification that includes the exporter devaluation indicator, a constant term, and a full set of fixed effects (as described above). Overall, the model appears to fit well as indicated by the high pseudo R-squared of 97.6%. The estimated coefficient on $\beta$ from Equation 1 is negative and statistically significant. When a country devalues, trade to its trade partners falls by an average of 22%.[9] Due to the large time dimension in the quarterly data, the results of the baseline regression are robust to the incidental parameter bias that emerges in

[9] $100(exp(-0.247) - 1) = -21.9\%$

"three-way" fixed effects Poisson Pseudo-Maximum Likelihood (Weidner and Zylkin 2021).[10] The estimated coefficient shown in the table captures the average effect of devaluation with respect to both trade partners being on gold. This set up allows us to focus specifically on (1) how currency wars affect international trade flows and (2) how global trade responds when many countries devalued, leading to the collapse of the global fixed-exchange rate system. In the context of a full-fledged currency war, devaluation can generate negative spillovers to global trade flows through increased trade frictions. Indeed, our estimates suggest that, on average, a country's decision to devalue erodes international trade, a finding consistent with the dramatic rise in trade costs in the early 1930s (Jacks, Meissner, and Novy 2008). From the perspective of a beggar-thy-neighbor argument, the negative sign on devaluation might seem counterintuitive since a change in the price of exports relative to competing imports could lead to an overall increase in exports. However, since our estimated gravity equation includes exporter-time fixed effects, we are controlling for the average effect on country $i's$ trade across all trade partners at the time of devaluation – typically how the literature has defined the beggar-thy-neighbor effect.[11] To further illustrate this point and better visualize the country specific average trends removed by the fixed effects, Appendix Figure A.2 displays the exporter-time fixed effects for three important countries in our sample period: Britain, the US, and France. For all three, we can see that the exporter-time fixed effect removes, in addition to a seasonal component, the collapse in trade that corresponded with the depression and the varying degree of recovery in the 1930s. Hence, the decline in trade that we identify with our measure of devaluation is in addition to this general trend captured by and displayed in the fixed effects.

Column 2 of Table 2 expands the regression to include time-varying, pairwise institutional factors that may also influence trade flows during our sample period (e.g., trade blocs and trade sanctions). Even when these are included, the estimated coefficient on $\beta$ remains statistically significant and negative. As expected, the inclusion of additional covariates slightly reduces the

[10] Original baseline coefficient:$-0.247(0.039)$, bias 0.003, bias corrected coefficient $-0.250(0.045)$***. Additional results of the bias correction are available upon request from the authors.

[11] The inclusion of exporter-time fixed effects also controls for policies that may have been directed at all trade partners, such as tariffs and quotas. For example, when the U.S. devalued, it simultaneously imposed a 10 percent import tax, a decision it reversed four months later as part of the Smithsonian Agreement.

magnitude of the effect, but devaluation still results in average reduction in trade of 18%. These baseline results provide evidence consistent with the interpretation that the currency war reduced trade, disrupting the multilateral payments system established through the interwar gold standard.

Table 2: Estimating the Effects of Devaluation on Trade Flows

| VARIABLES | (1) Baseline | (2) Baseline + Controls | (3) Baseline + Controls |
|---|---|---|---|
| Devaluation | -0.247*** | -0.201*** | |
| | (0.0394) | (0.0416) | |
| Devaluation (size) | | | -0.320*** |
| | | | (0.0801) |
| Observations | 105,701 | 105,701 | 75,824 |
| Controls | NO | YES | YES |
| ExporterTimeFE | YES | YES | YES |
| ImporterTimeFE | YES | YES | YES |
| PairFE | YES | YES | YES |
| Pseudo R-squared | 0.976 | 0.977 | 0.977 |

All regressions include exporter-time, importer-time, and pair fixed effects.
Standard errors are clustered at the country-pair level and shown in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Because countries devalued by varying degrees relative to gold, column 3 of Table 2 considers the effects of the relative size of the devaluations. That is, instead of using an indicator variable to code the effects of a devaluation, in this specification we scale our treatment variable as the change in the parity of the exporter relative to each of its trade partners at the time of the exporter's devaluation. To be consistent with the way we have coded the extensive margin, we multiply the relative size of the devaluation with our previous treatment variable. We calculate the movement in the exchange rate using the gold parity values provided in League of Nations (1930). The movement is expressed as the percentage change relative to the difference in the trade pair's pre-devaluation gold parities.[12] Column 3 shows that the estimated coefficient on devaluation remains negatively signed and statistically significant. The coefficient can be interpreted as a

[12]For example, Great Britain devalued with respect to the US in September 1931. The intensive margin "turns on" in 1931Q3 and takes on values of $0.002, 0.201, 0.252, 0.229, 0.271, 0.302, 0.294$, before dropping to 0.174 when the US devalues in Q2 1933 and then further to 0.021 in 1933Q3.

percentage decrease in average trade flows in response to a one-percentage-point increase in the size of devaluation. I.e. the size of the initial 20.1% depreciation of the British pound versus the US dollar, contributed an additional 5.5% decrease in bilateral trade flows.

### VI.A Heterogeneity

Columns 1 and 2 of Table 3 focus on the group-wise dissolution of the international gold exchange standard and its effect on the periphery, thereby further examining how devaluations influenced trade flows (Ritschl and Wolf 2011). The first column examines whether the estimated negative effect varies by the type of currency bloc that a country is engaged in, namely the Sterling Bloc (comprising countries that leave the gold standard towards the end of 1931 as Britain abandons gold); the Reichsmark Bloc (including countries that intensified trade with Nazi-Germany and resorted to exchange controls), the Gold Bloc (comprising countries staying on gold through 1935 and 1936); and the remaining devaluers. Interestingly, our baseline result appears to be strongest for the Reichsmark Bloc countries that devalued as well as the non-aligned set of devaluers, but less so for the Sterling and Gold Bloc countries. One reason we may see this result is that the Sterling Bloc countries were able to buffer part of the negative trade effects of the devaluation by intensifying trade within the trade bloc.[13] An alternative explanation is that periphery countries, which are overrepresented in the Reichsmark Bloc and the non-aligned group of remaining devaluers, were more strongly affected by the devaluation.

To explore heterogeneity across countries further, Column 2 restricts the sample exclusively to the periphery by excluding trade involving polities located in Europe as well as those in the United States and Canada, i.e., periphery excludes north-north Atlantic trade. The number of observations is about 12% of the original sample, highlighting the large amount of global trade in the interwar period that was north-north in orientation. The devaluation coefficient shows a large decline of 45%. In other words, the dissolution of the international system of pegged rates appears to have had an even larger impact in the periphery, raising trade costs disproportionately in economies that were very reliant on global trade. On the other hand, earlier devaluers that were leaving gold jointly with other countries, such as the Sterling bloc, were able to minimize the

[13] See Lampe et al. (2024) for evidence on Canada.

negative trade impacts of the gold standard's collapse.

Table 3: Estimating the Effects of Devaluation on Trade Flows

| VARIABLES | (1) Currency Blocs | (2) Non Europe or NA | (3) Import Quotas | (4) Exchange Controls |
|---|---|---|---|---|
| Devaluation Sterling Bloc | -0.0272 | | | |
| | (0.0929) | | | |
| Devaluation Reichsmark Bloc | -0.390** | | | |
| | (0.157) | | | |
| Devaluation Gold Bloc | -0.0533 | | | |
| | (0.0450) | | | |
| Remaining Devaluers | -0.203*** | | | |
| | (0.0437) | | | |
| Devaluation | | -0.606*** | -0.153*** | -0.206*** |
| | | (0.191) | (0.0554) | (0.0419) |
| Import Quotas | | | -0.0721 | |
| | | | (0.0557) | |
| Exchange Controls | | | | -0.0809 |
| | | | | (0.0550) |
| Observations | 105,701 | 13,051 | 105,701 | 105,701 |
| Controls | YES | YES | YES | YES |
| ExporterTimeFE | YES | YES | YES | YES |
| ImporterTimeFE | YES | YES | YES | YES |
| PairFE | YES | YES | YES | YES |
| Pseudo R-squared | 0.977 | 0.978 | 0.977 | 0.977 |

All regressions include exporter-time, importer-time, and pair fixed effects.
Standard errors are clustered at the country-pair level and shown in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

### VI.B Quotas and Exchange Controls

As Eichengreen and Irwin (2010) suggest, exchange-rate devaluations were one possible strategy domestic policy makers considered in order to stimulate their economies. Alternate policy responses to the Great Depression included the use of tariffs and quotas. If these measures where imposed on all other trade partners, they are controlled for in our model by the inclusion of importer-time and exporter-time fixed effects. To the extent that they can be identified in the historical literature, our model also controls for tariffs targeted at specific countries rather than all

trade partners. Examples include the Smoot-Hawley Trade War, the Anglo-Irish Trade War, the German-Polish Trade War, and the League of Nations sanctions against Italy. In a similar vein, quotas could have been targeted at specific countries. In our setting, we might be concerned that retaliatory quotas were aimed at trade partners that devalued, so it is worth examining how this might have been implemented. Albers (2020) suggests that some countries that stayed on gold longer (e.g., Gold Bloc members such as France and Switzerland), retaliated against devaluers by imposing quotas and changing commercial policy.[14] If retaliation is driving the result, then by including time-varying bilateral quotas, the coefficient on this variable should be negative and statistically significant and the devaluation effect should be statistically insignificant.[15] When these time-varying bilateral quotas are included, the results in column 3 suggest that the effect of quotas is not statistically significantly different from zero, while devaluation stays negative and statistically significant (though it is slightly smaller in magnitude).

Countries also used exchange controls during our sample period. As Eichengreen and Irwin (2010) have noted, these were sometimes used as a response to devaluation – to block the short-term changes in the terms of trade arising from a trade partner's devaluation without having to devalue as well. Exchange controls could have further increased trade frictions (perhaps even operating as a tax on trade as in Chi, Schmitt-Grohe, and Uribe (2024). So as to ensure that we account for their effects, we used League of Nations and Mitchener and Wandschneider (2015) to code the dates when exchange controls were implemented. Column 4 of Table 3 thus includes an additional control variable capturing when one or both countries in a given trade pair had imposed exchange controls. As the estimated effect on devaluation shows, the baseline result is robust to the inclusion of exchange controls. The coefficient remains negative and statistically significant, and the size is roughly comparable to our baseline estimates presented in Table 2. Exchange controls themselves appear to have had no independent and significant effect on trade flows.

[14]It is also possible that those countries that stayed on gold longer became more protectionist, as discussed in Eichengreen and Irwin (2010) and Irwin (2012). Note, however, our estimation equation controls for this general policy change by including importer-time fixed effects.

[15]Data on quotas are based on Haberler (1943). The bilateral quota dummy is equal to one at the time the importing country imposes quotas.

## VII Discussion

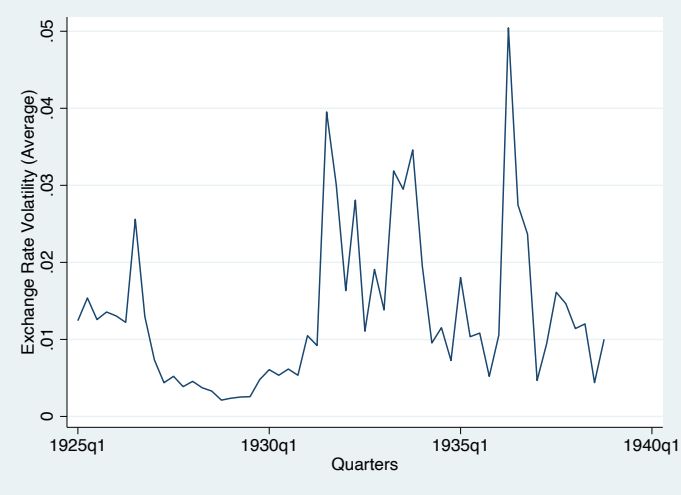
When many large global economies made fateful decisions to abandon gold and devalue, they offered little forward guidance in terms of what would come next – whether, for example, they would choose to repeg or allow their currencies to float indefinitely? Nor did they necessarily reveal if and when they would respond if their major trading partners devalued – suggesting that the international policy environment became more uncertain after devaluations began.

Decisions to devalue appear to have been largely motivated by domestic considerations, including political timing and raising the price level after years of deflation (Edwards 2017; Harris 1936; Simmons 1997; Wandschneider 2008). Indeed, little regard was paid to maintaining the system of fixed exchange rates that had prevailed since the mid-1920s or to the fact that their devaluations might lead other countries to retaliate by weaponizing their currencies. Recent scholarship has referred to this period of uncertainty as a "collapse into mayhem"(Harris 2021, p.11), with the classic account conjecturing that uncoordinated devaluations depressed trade (Eichengreen and Sachs 1985, p.945).

Figure 2 shows one realization of this exchange-rate policy uncertainty during our sample period – the larger realized exchange-rate volatility once the currency war commenced. If exchange-rate policy had normalized, it's likely that volatility would have subsided. However, exchange-rate volatility, as measured as the standard deviation of the first difference of monthly bilateral exchange rates, increased five-fold after the first large cohort of countries abandoned the gold standard in September 1931 and remained elevated throughout the remainder of our sample period.

Even when the UK eventually showed signs of wanting to stabilize the value of the pound sterling, and created the Exchange Equalization Account in April 1932, its precise plans for the path of the pound as well as its balances were kept secret from other central banks as well as the public (Harris 2021). In other words, exchange-rate policy coordination, which had been accomplished relatively smoothly through an international system of fixed exchange rates longer seemed to a first-order policy consideration. This point was driven home by the failure of the World Economic Conference of 1933 to reach an agreement over stabilizing exchange rates (Kindleberger 1986) – where the French issued an ultimatum to the U.S. to "stabilize" or they would quit their participation

Figure 2: Exchange Rate Volatility (monthly), GFD data




Note: Authors' calculations.

conference and U.S. President Roosevelt responded with a refusal to strike an agreement, arguing domestic goals, in particular "sustained inflation," should not be sacrificed for international ones and the "spacious fallacy of achieving a temporary and probably an artificial stability on foreign exchanges on the part of a few countries."[16]

Exchange-rate policy uncertainty remained elevated so long as major economies like France attempted to stay on gold. Speculative capital proved flighty, often flowing out of non-exchange control countries, such as France, in anticipation of an eventual devaluation, and into the UK and US, leading to further fluctuations in their exchange rates.

The collapse of the international monetary system and lack of regime coordination represented a huge uncertainty shock, and one that more than likely required considerable adjustments by exporters and importers on a number of margins – leading to higher trade costs and potentially depressing trade flows. For example, given some pass through in prices, devaluation by a trade partner implied search costs for the sourcing of of imported raw materials and intermediate goods that otherwise could not be met through increased domestic production. To the extent that the domestic country did not immediately respond by devaluing, it have also led to more-expensive sourcing of raw materials and intermediate goods relative to "first best" trade partners, i.e., those they traded with prior to devaluation.

[16]Quotation is from Edwards (2017, p.11).

Commenting on the currency war of the 1930s, contemporary economists further noted that the volume of foreign exchange transactions might increase due to increased exchange-rate uncertainty, raising transactions costs per unit of trade (Whittlesey 1937). They also noted that invoicing costs might rise, given that many devalued currencies were no longer formally tied to gold. In short, these channels point to an increase in trade costs arising from the currency war, and suggest why average trade flows may have fallen during the currency war.

Finally, recent trade models also highlight the possibility that, more generally, uncertainty shocks can have disproportionate effects on international trade flows via differences in cost structure. For example, Novy and Taylor (2020) develop a model and use data from the late 2000s to show that firms disproportionately cut orders of foreign inputs due to higher fixed costs in response to an uncertainty shock, leading to a trade collapse in 2008-9 that was even greater than the decline in domestic output. If one interprets the collapse of the international gold standard system and a currency war as an uncertainty shock, a large drop in trade seems entirely plausible based on this line of reasoning.

## VIII Robustness

Table 4 provides an additional set of robustness checks. Because colonial devaluation decisions may not be independent of those of the metropole, Column 1 of the table excludes all trade flows to and from colonies, and presents results only on the trade between the 59 sovereign countries in our sample. When we focus on country-only trade, the effects are similar to those reported in the previous columns. Our coefficient of interest remains negative and statistically significant, indicating a 17.3% reduction in trade flows for the sovereigns following a devaluation. This robustness check suggests that the results on devaluation's effects on trade are not sensitive to the inclusion of the colonies.

For comparison with the literature on the linkage between general devaluation and recovery from the Depression, Column 2 limits the sample to a comparison of European countries in the seminal article on devaluation and domestic recovery from the Great Depression by Eichengreen and Sachs (1985) sample (Belgium and Luxembourg, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Sweden, and the UK). The estimated coefficient on devaluation is a little

smaller in magnitude but still negative and statistically significant at conventional levels – again suggesting that the deleterious effects of monetary disintegration on trade flows were larger in the non-European periphery and less so in Europe.[17]

Table 4: Robustness Checks

| VARIABLES | (1) Sovereign | (2) Eichengreen-Sachs Subset | (3) Exchange-rate Volatility |
|---|---|---|---|
| Devaluation | -0.189*** | -0.158*** | -0.245*** |
| | (0.0440) | (0.0457) | (0.0503) |
| Observations | 71,496 | 25,917 | 59,569 |
| Controls | YES | YES | YES |
| ExporterTimeFE | YES | YES | YES |
| ImporterTimeFE | YES | YES | YES |
| PairFE | YES | YES | YES |
| Pseudo R-squared | 0.978 | 0.985 | 0.978 |

All regressions include exporter-time, importer-time, and pair fixed effects.
Standard errors are clustered at the country-pair level and shown in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Similarly, results for the devaluation effect remain statistically significant, negative, and similar in size when we explicitly include monthly bilateral exchange-rate volatility.[18] This finding is similar to those reported in the contemporary literature on exchange-rate volatility's effects on trade flows (compare Tenreyro (2007)), and suggests that, in our case, the dissolution of the entire monetary system, rather than simply increased volatility explains the decline in trade.

A country's decision to devalue might not be made in isolation. In other words, countries might have responded to the exchange-rate choices of their main trade partners. Table 5 thus considers additional specifications that account for ways in which this might have mattered.

[17] By sequentially dropping all countries and colonies one-by-one from the sample, we also confirmed that results are not driven by one single country in the sample. Results are not reported here, but are available from the authors.

[18] While the reported results may appear to suggest that exchange-rate volatility actually increased the trade effect of devaluation compared to our baseline result, this finding is entirely driven by the changing sample size that results from including the exchange-rate volatility data. When restricting our baseline sample to the observations that correspond to the exchange-rate volatility dataset, our parameter of interest, with a coefficient of $-2.413(0.050)$, is virtually unchanged from the result presented in the baseline results.

One reason interdependence might have arisen is because periphery countries supplemented the gold backing of their currencies with the reserves of center countries, and therefore a devaluation at the core might have triggered further devaluations on the periphery. Eichengreen and Flandreau (2009) state that, even by 1929, 97% of the world's currency reserves were split between the US dollar and the British pound, with the balance tipping towards the USD. Column 1 of Table 5 therefore presents results excluding the UK and the U.S. – the two global trade and monetary powers in the interwar period. The coefficient on devaluation remains negative and statistically significant when trade with these two countries is excluded. If anything, the estimated coefficient is even larger than the baseline results shown in Table 2 (The average effect of devaluation is a 29% decline in trade). This finding again suggests that the currency war had even larger effects for non-reserve currency countries.

Table 5: Endogeneity and Timing

| VARIABLES | (1) Excluding UK and US | (2) no UK US FRA | (3) drop main trade partner | (4) Devalue by 1931Q3 | (5) ETWFE |
|---|---|---|---|---|---|
| Devaluation | -0.315*** | -0.339*** | -0.218*** | -0.0921** | -0.397*** |
| | (0.0517) | (0.0574) | (0.0417) | (0.0390) | (.0642) |
| Observations | 85,848 | 81,306 | 100,546 | 93,168 | 87,811 |
| Controls | YES | YES | YES | YES | YES |
| ExporterTimeFE | YES | YES | YES | YES | YES |
| ImporterTimeFE | YES | YES | YES | YES | YES |
| PairFE | YES | YES | YES | YES | YES |
| Pseudo R-squared | 0.967 | 0.963 | 0.974 | 0.978 | 0.977 |

All regressions include exporter-time, importer-time, and pair fixed effects.
Standard errors are clustered at the country-pair level and shown in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The next column of this table also drops France, another core country in the interwar version of the gold standard), so that we can also consider a specification that removes the three key combatants in the currency war – the three countries that triggered the main 'waves' of devaluation in 1931, 1933 and 1936. Column 2 confirms that the main findings are not sensitive to also excluding France. Again, the coefficient of interest remains negative and statistically significant, rising

slightly in size.

To account for the possibility that interdependence in participation in the currency war might have arisen because of pre-existing trade relationships, we next identified each country's most important export destination (defined as the trade partner receiving the largest share of exports by value in 1928) and then estimate a regression where we exclude bilateral flows with this partner from the estimated effects. It is worth noting that the UK is far and away the largest export destination, with about half of the economies in our sample sending the majority of their exports to Britain. The US and Germany are the second and third most dominant export partners, each being the main export destination for about 20% of countries in our sample. Regardless, we take each country's most important trade partner and exclude it from the estimate shown in column 3 of Table 3. The estimated coefficient on devaluation remains negative and statistically significant at conventional levels and is comparable in size to our baseline regression, suggesting that the results are not driven by countries responding to their main trade partners' exchange-rate decisions.

A final econometric concern we consider is that the timing of devaluations introduces staggered treatment, i.e., economies do not devalue in the same period. Addressing this in the context of structural gravity is challenging as theoretically grounded estimates include importer-time, exporter-time fixed, and pairwise effects. We can address the underlying type of bias that could arise from staggered treatment in our setting by simply focusing on the very first wave of devaluations and comparing them to a "not yet treated" sample. Column 4 in Table 3 therefore only estimates the devaluations of countries that do so in the "first round," before the end of 1931, thereby reducing the number of "treated" countries accordingly. In this specification, the negative effect of unilateral devaluations on trade flows maintains its statistical significance at $p < 0.1$. By design, this estimate only captures the initial impact of collapse of the international monetary system on trade, so it is not surprising that the reported point estimate on devaluation is smaller in Column 4.[19] Alternatively, Nagengast and Yotov (2024) propose an extended two-way fixed effect (ETWFE) estimator for staggered difference in differences within the structural gravity model

[19]The estimates are also potentially biased downward to the extent that a few "first mover" countries devalued multiple times. For example, our estimates capture New Zealand's devaluation against the British pound in April 1930, but not its additional devaluation against the pound in 1933.

based on Wooldridge (2023).[20] This procedure estimates dynamic treatment effects using only the "not yet" and the "never treated" observations as the control group. Applying the ETWFE estimator to our setting confirms that the negative and statistically significant coefficient shown in our baseline estimates, but also suggests it may be biased downward. The dynamic ETWFE estimator is -0.397 versus -0.201 for the baseline estimate with controls (column 2 of Table 2), indicating a drop in trade by 32.8% rather than 18.2%. This suggests that the baseline estimate underestimates the true effect by almost half.

## IX Welfare Effects

While standard gravity models offer partial effects of the changes in policies on trade, researchers might also be interested in the general equilibrium (GE) effects of the dissolution of the interwar gold standard. That is, the gravity results presented above display the average decrease in trade between any pair of countries where at least one partner has left gold, holding fixed all endogenous variables, but researchers might also be interested in the general equilibrium changes in trade volumes as a result of the devaluations.

We follow a recent literature in trade that estimates GE effects using just a few observed variables.[21] To do so, we assume that the value of a country's shipments across all destinations (foreign and domestic) must add up to its labor income:

$$Y_i = w_i L_i = \sum_j X_{ij} \,, \tag{2}$$

where $Y_i$ represents domestic income, $w_i$, and $L_i$ are the domestic wage and the domestic labor force, and $\sum_j X_{ij}$ is the total expenditure (also equal to the sum of the value of shipments across all origins) for country $i$.

Following Dekle, Eaton, and Kortum (2007), Yotov et al. (2016) and Baier, Yotov, and Zylkin (2019), we can then write country $i$'s wage equation as a function of how easily it can sell to markets with high levels of demand and its price level as a function of how easily it can buy from

[20] The ETWFE estimator addresses concerns with staggered treatment design as discussed in Borusyak, Jaravel, and Spiess (2024), Goodman-Bacon (2021), Chaisemartin and D'Haultfœuille (2020), and Sun and Abraham (2021)

[21] See for example Eaton and Kortum (2002), Arkolakis, Costinot, and Rodríguez-Clare (2012) and Felbermayr, Jung, and Larch (2015).

Table 6: GE effects on trade

Percentage decline in bilateral trade as predicted by a GE framework

| Countries devaluing in 1931 | | Countries not devaluing in 1931 | |
|---|---|---|---|
| Sweden | -11.94 | USA | -3.18 |
| Norway | -14.61 | Italy | -4.54 |
| Japan | -13.81 | France | -4.93 |
| GBR | -15.07 | Germany | -4.10 |
| Finland | -10.17 | Switzerland | -4.37 |
| Denmark | -12.06 | Brazil | -4.09 |
| Canada | -9.29 | Belgium | -4.32 |
| Austria | -12.05 | | |
| Average | -12.38 | Average | -4.22 |

efficient producers. To solve this model, it is only necessary to have information on trade volumes, national output and expenditure, and a value for the trade elasticity $\theta$, which is usually taken as an estimate from the literature. Once we have pinned down the wage level, we can compute the GE trade impact as:

$$\widehat{X}_{ij} = \frac{\widehat{w}_i^{-\theta} e^{\beta Treatment_{ij}}}{\widehat{P}_j^{-\theta}} \widehat{E}_j \,, \tag{3}$$

where $w_i$ is the domestic wage, $P_j$ is the foreign price level, $\theta$ is the trade elasticity of demand, and $E_j$ is the change in foreign expenditure.

Applying this set up to historical data requires knowledge of domestic output and expenditures which, due to data limitations, greatly reduces the number of countries we can consider relative to our trade dataset. We thus focus on a subset of 15 sample countries surrounding the 1931 devaluation for which there are reliable data on trade, output, and total expenditure. Table 6 shows the general equilibrium impact on trade flows of the devaluation on the countries in this subsample that devalued in 1931 versus those countries that did not. Given that the GE estimation includes many influences that may go in the opposite direction of devaluations' effects on bilateral trade flows, it is not surprising that the GE effects are somewhat smaller in comparison to the partial equilibrium results from our gravity models, with 12.4% drop in trade on average for the countries that devalued versus 4.2% on average for the non-devaluing trade partners. Although the GE estimation is limited in scope by data availability, the results nevertheless confirm the

findings from our partial equilibrium analysis – that the dissolution of the gold-exchange standard was costly for both countries that devalued and their trade partners.

## X Conclusion

It has been argued that the 1930s was a period without economic leadership (Kindleberger 1986) – one that led to the largest currency war in history. The story goes that Britain had reluctantly passed the baton to the U.S., but the U.S. then failed to conduct the "international orchestra." At least in terms of exchange-rate policy, Keynes' musical metaphor certainly seems apt. Britain's devaluation in 1931, later followed by the U.S.'s in 1933, ended any sense of regime coordination (Harris 2021). To drive home the point, U.S. President Roosevelt chose to skip the World Economic Conference in London in June 1933 and instead vacationed in New England. By this juncture, it was clear that representatives from the U.S. and UK had come to view the world's economic situation quite differently from policymakers of the previous decades (Eichengreen and Uzan 1990) and no path forward for ending the currency war emerged from the conference, as French Premier Daladier complained. The devaluations of the early 1930s already signaled a new approach to policy-making: countries would prioritize their domestic economic situations over the international system, without offering clear signals as to what would replace the now defunct interwar gold standard. A stable system of exchange rates had been replaced by policy uncertainty.

How consequential was this collective abandonment of the interwar gold standard? In terms of trade, quite so. With more than 70 economies devaluing, trade flows were disrupted by rising trade frictions and costs. Using a new quarterly bilateral trade dataset, we estimate that the currency war reduced trade by at least 18% on the extensive margin and even more (up to 45%) when taking into account the size of the devaluations. When accounting for other influences, the general equilibrium effects suggest that up through 1931 (the first wave of devaluations) trade fell by around 12% for devaluing countries and their trade partners. Delivering a trade outcome that was better for all countries would have likely required a degree of policy coordination that clearly was absent in the early 1930s (Eichengreen 1982; Nurkse 1944).

Our findings do not imply that devaluations failed to provide domestic economic benefits to countries that undertook them. Indeed, the literature on beggar-thy-neighbor effects has suggested

many ways in which they may have mattered in this regard (e.g., raising domestic prices and allowing money supplies to expand and provide relief to troubled financial systems). Nor do they imply devaluations reduced the overall welfare for individual countries, though they do point to a reduction in trade volume also in a general equilibrium framework. Rather, our results provide an additional reason why trade flows fell precipitously in the 1930s relative to the period before the Great Depression — the world's largest currency war put an end to the international monetary system. Indeed, policymakers seem to have carried that "lesson" with them when the finally returned to negotiating tables after the conclusion of World War II. The disruption to trade that the currency war unleashed was to be avoided, and served as inspiration for the framework of the next international system that emerged, Bretton Woods.

Finally, it is worth noting the limitations of our estimates. Although the paper's primary goal is to estimate the effects of devaluing on trade with non-devaluers, the currency war did not end once a country responded to a particular belligerent. Indeed, it is likely that such responses affected the trade of earlier belligerents as well as other countries still remaining on gold. Therefore, this paper's findings are likely lower-bound estimates of the overall impact of the 1930s currency war on international trade.

## References


Albers, Thilo (2020). "Currency Devaluations and Beggar-Thy-Neighbor Penalties: Evidence from the 1930s". In: *The Economic History Review* 73.1, pp. 233–257.

Arkolakis, Costas, Arnaud Costinot, and Andrés Rodríguez-Clare (2012). "New Trade Models, Same Old Gains?" In: *American Economic Review* 102.1, pp. 1–14.

Baier, Scott L., Yoto V. Yotov, and Thomas Zylkin (2019). "On the Widely Differing Effects of Free Trade Agreements: Lessons from Twenty Years of Trade Integration". In: *Journal of International Economics* 116, pp. 206–226.

Borusyak, Kirill, Xavier Jaravel, and Jann Spiess (2024). "Revisiting Event-Study Designs: Robust and Efficient Estimation". In: *The Review of Economic Studies* 91.6, pp. 3253–3285.

Bouscasse, Paul (2022). "Canst Thou Beggar Thy Neighbour? Evidence from the 1930s". Unpublished Paper, Columbia University.

Caballero, Ricardo J., Emmanuel Farhi, and Pierre-Olivier Gourinchas (2021). "Global Imbalances and Currency Wars at the Zero Lower Bound". NBER Working Paper 21670.

Campa, José Manuel (1990). "Exchange Rates and Economic Recovery in the 1930s: An Extension to Latin America". In: *Journal of Economic History* 50.3, pp. 677–682.

Candia, Bernardo and Mathieu Pedemonte (2021). "Export-Led Decay: The Trade Channel in the Gold Standard Era". Unpublished Paper, Cleveland Federal Reserve Bank.

Chaisemartin, Clément de and Xavier D'Haultfœuille (2020). "Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects". In: *American Economic Review* 110.9, pp. 2964–96.

Chi, Chun-Che, Stephanie Schmitt-Grohe, and Martin Uribe (2024). "Optimal Bank Reserve Remuneration and Capital Control Policy". In: *American Economic Journal: Macroeconomics, forthcoming* 4.

Choudhri, Ehsan U. and Levis A. Kochin (1980). "The Exchange Rate and the International Transmission of Business Cycle Disturbances: Some Evidence from the Great Depression". In: *Journal of Money, Credit and Banking* 12.4, pp. 565–574.

Dekle, Robert, Jonathan Eaton, and Samuel Kortum (2007). "Unbalanced Trade". In: *American Economic Review* 97.2, pp. 351–55.

Eaton, Jonathan and Samuel Kortum (2002). "New Trade Models, Same Old Gains?" In: *Econometrica* 70.5, pp. 1741–1779.

Edwards, Sebastian (2017). "The London Monetary and Economic Conference of 1933 and the End of the Great depression: A 'Change of Regime Analysis'". NBER Working Paper 23204.

Eichengreen, Barry and Marc Flandreau (2009). "The Rise and Fall of the Dollar (or when Did the Dollar Replace Dterling as the Leading Reserve Currency?)" In: *European Review of Economic History* 13, pp. 377–411.

Eichengreen, Barry and Douglas A. Irwin (2010). "The Slide to Protectionism in the Great Depression: Who Succumbed and Why?" In: *Journal of Economic History* 70, pp. 872–898.

Eichengreen, Barry and Jeffrey Sachs (1985). "Exchange Rates and Economic Recovery in the 1930s". In: *Journal of Economic History* 45.4, pp. 925–946.

Eichengreen, Barry and Marc Uzan (1990). "The 1933 World Economic Conference as an Instance of Failed International Cooperation". Unpublished Paper, Department of Economics, UC Berkeley.

Eichengreen, Barry J. (1982). *Golden Fetters: The Gold Standard and the Great Depression, 1919-1939*. Oxford: Oxford University Press.

Ellison, Martin S., Sang Seok Lee Lee, and Kevin O'Rourke (2024). "The Ends of 27 Big Depressions". In: *American Economic Review* 114.1, pp. 134–168.

Estevadeordal, Antoni, Brian Frantz, and Alan M. Taylor (2003). "The Rise and Fall of World Trade, 1870–1939". In: *Quarterly Journal of Economics* 118.2, pp. 359–407.

Felbermayr, Gabriel, Benjamin Jung, and Mario Larch (2015). "The Welfare Consequences of Import Tariffs: A Quantitative Perspective". In: *Journal of International Economics* 97.2, pp. 295–309.

Goodman-Bacon, Andrew (2021). "Difference-in-differences with Variation in Treatment Timing". In: *Journal of Econometrics* 225.2, pp. 254–277.

Haberis, Alex and Anna Lipinska (2020). "A Welfare-Based Analysis of International Monetary Policy Spillovers at the Zero Lower Bound". In: *Journal of Money, Credit and Banking* 52.5, pp. 1107–1145.

Haberler, Gottfried (1943). *Quantitative Trade Controls, their Causes and Nature*. Geneva: League of Nations.

Harris, Max (2021). *Monetary War and Peace: London, Washington, Paris and teh Tripartite Agreement of 1936*. New York: Cambridge University Press.

Harris, Seymour (1936). *Exchange Depreciation: Its Theory and History, 1931-35 with Some Consideration of Domestic Policies*. Cambridge, MA: Harvard University Press.

Head, Keith, Thierry Mayer, and John Ries (2010). "The Erosion of Colonial Trade Linkages after Independence". In: *Journal of International Economics* 81.1, pp. 1–14.

Hornok, Cecilia (2012). "Gravity or Dummies? The Limits of Identification in Gravity Estimations". CEU Working Papers, No 2012-11.

Irwin, Douglas A. (2012). *Trade Policy Disaster: Lessons from the 1930s*. Cambridge, MA: MIT Press.

Jacks, David S., Christopher M. Meissner, and Dennis Novy (2008). "Trade Costs, 1870-2000". In: *American Economic Review: Papers and Proceedings* 98.2, pp. 529–534.

Kindleberger, Charles P. (1986). *The World in Depression, 1929-1939*. 2nd ed. Berkeley, CA: University of California Press.

Klein, Michael W. and Jay C. Shambaugh (2006). "Fixed Exchange Rates and Trade". In: *Journal of International Economics* 70, pp. 359–383.

Korinek, Anton (2017). "Currency Wars or Efficient Spillovers? A General Theory of International Policy Cooperation". IMF Working Paper 17/24.

Krugman, Paul and Lance Taylor (1978). "Exchange-Rate Regimes and International Trade: Evidence from the Classical Gold Standard Era". In: *Journal of International Economics* 8, pp. 445–456.

Lampe, Markus, Kevin H. O'Rourke, Lorenz Reiter, and Yoto Yotov (2024). "The Empire Project: Trade Policy in Interwar Canada". In: *Journal of International Economics* forthcoming.

League of Nations (1933). *Journal of the Monetary and Economcic Conference*. Geneva: League of Nations.

League of Nations (1930). *Memorandum on International Trade and Balances of Payments, 1927-29. Review of World Trade, Volume I*. Geneva: League of Nations.

— (1937). *World Economic Survey*. Geneva: League of Nations.

Lee, Jong-Wha and Kwanho Shin (2004). "Exchange Rate Regimes and Economic Linkages". https://ssrn.com/abstract=596026.

Lopez-Cordova, J. Ernesto and Christopher M. Meissner (2003). "Exchange- Rate Regimes and International Trade: Evidence from the Classical Gold Standard Era". In: *American Economic Review* 93.1, pp. 344–353.

Mathy, Gabriel P. and Christopher M. Meissner (2011). "Business Cycle Co-movement: Evidence from the Great Depression". In: *Journal of Monetary Economics* 58, pp. 362–372.

Mitchener, Kris James, Kevon H. O'Rourke, and Kirsten Wandschneider (2022). "The Smoot-Hawley Trade War". In: *Economic Journal* 132, pp. 2500–53.

Mitchener, Kris James and Kirsten Wandschneider (2015). "Capital Controls and Recovery from the Financial Crisis of the 1930s". In: *Journal of International Economics* 95.2, pp. 188–201.

Nagengast, Arne J. and Yoto Yotov (2024). "Staggered Difference-in-Differences in Gravity Settings: Revisiting the Effects of Trade Agreements". In: *American Economic Journal: Applied Economics* 102.4, pp. 749–65.

Novy, Dennis and Alan M. Taylor (2020). "Trade and Uncertainty". In: *Review of Economics and Statistics* 102, pp. 749–65.

Nurkse, Ragnar (1944). *International Currency Experience: Lessons of the Interwar Period*. Geneva: League of Nations.

Ritschl, Albrecht and Nikolaus Wolf (2011). "Endogeneity of Currency Areas and Trade Blocs: Evidence from a Natural Experiment". In: *Kyklos* 64.2, pp. 291–312.

Robinson, Joan (1937). "Beggar-my-neighbour Remedies forUunemployment". In: *Essays in the Theory of Employment*. London: Macmillan, pp. 210–230.

Rose, Andrew K. (2021). "Currency Wars? Unconventional Monetary Policy Does Not Stimulate Exports". In: *Journal of Money, Credit and Banking* 53.5, pp. 1079–96.

Santos Silva, J. M. C. and Silvana Tenreyro (2006). "The Log of Gravity". In: *Review of Economics and Statistics* 88.4, pp. 641–658.

Simmons, Beth A. (1997). *Who Adjusts?* Princeton, New Jersey: Princeton University Press.

Sun, Liyang and Sarah Abraham (2021). "Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects". In: *Journal of Econometrics* 225.2, pp. 175–199.

Tenreyro, Silvana (2007). "On the Trade Impact of Nominal Exchange Rate Volatility". In: *Journal of Development Economics* 82, pp. 485–508.

Wandschneider, Kirsten (2008). "The Stability of the Interwar Gold Exchange Standard—Did Politics Matter?" In: *The Journal of Economic History* 68.01, pp. 151–181.

Weidner, Martin and Thomas Zylkin (2021). "Bias and Consistency in Three-way Gravity Models". In: *Journal of International Economics* 132.

Whittlesey, Charles R. (1937). *International Monetary Issues*. New York: McGraw-Hill.

Wooldridge, Jeffrey M. (2023). "Simple Approaches to Nonlinear Difference-in-Differences with Panel Data". In: *The Econometrics Journal* 26.3, pp. C31–C66.

Yotov, Yoto V., Piermartini Roberta, José-Antonio Monteiro, and Mario Larch (2016). *An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model*. Geneva: World Trade Organization.

# A Appendix

Table A.1: Summary of Devaluations

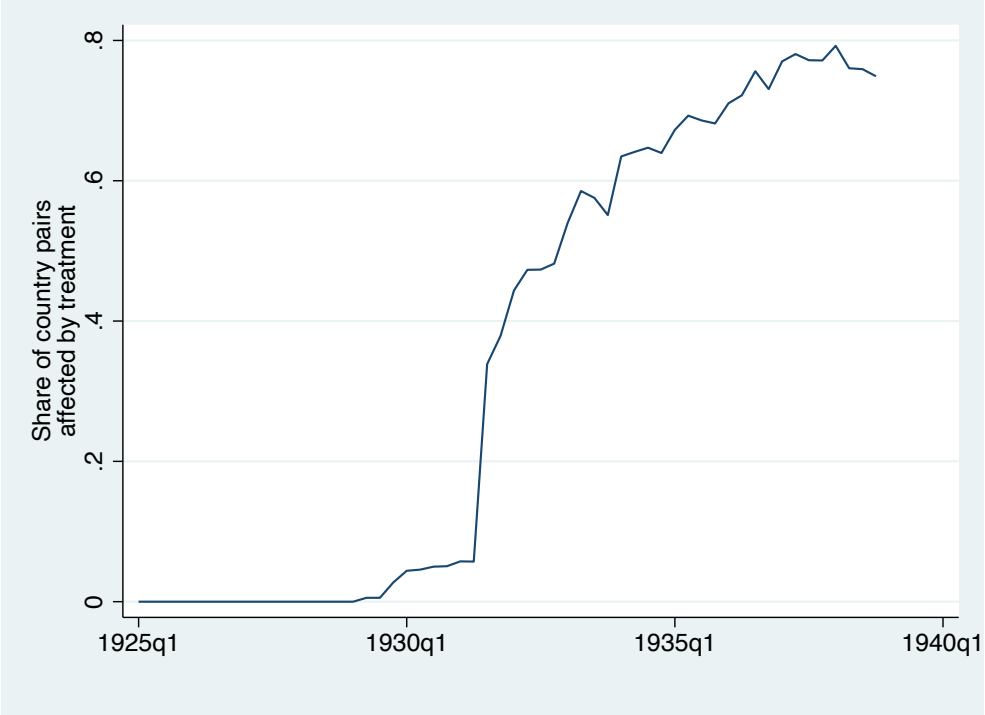
| | League of Nations (1937) | | Brown Kemmerer Officer OT Wolf | | | | | Ellison et al. | Our Coding |
|---|---|---|---|---|---|---|---|---|---|
| Country | Official suspension of gold | Depreciation/ devaluation to gold | Departure from gold | | | | | Departure from gold | Departure |
| Albania | | | | | | | | | w/YUG |
| Arabia | | | | | | | | | 1931Q3 |
| Argentina | Dec-29 | Nov-29 | Nov-29 | 1929 | 1929 | Dec-29 | | | 1929Q4 |
| Ascension & Falklands | | | | | | | | | 1931Q3 |
| Australia | Dec-29 | Mar-30 | Mar-30 | 1929 | 1930 | Jan-30 | | Jan-31, & Sept-31 | 1930Q1 w/NZ |
| Austria | Apr-33 | Sept-31 | Oct-31 | 1931 | 1931 | Oct-31 | Sept-31 & Apr-33 | Oct-31 | 1931Q3 |
| Belgium | Mar-35 | Mar-35 | | 1935 | 1935 | Mar-35 | | Mar-36 | 1935Q1 w/LUX |
| Belgian Africa | | | | | | | | | 1935Q1 |
| Bolivia | Sept-31 | Mar-30 | | | | | | | 1930Q1 |
| Brazil | | Dec-29 | Dec-29 | 1930 | 1929 | Dec-29 | | Dec-29 & Oct-30 | 1929Q4 |
| British East Africa | | | | | | | | | 1931Q3 |
| British East Indies | | | | | | | | | 1931Q3 |
| British Mediterranean | | | | | | | | | 1931Q3 |
| British Southern Africa | | | | | | | | | 1931Q3 |
| British Sudan | | | | | | | | | 1931Q3 |
| British West Africa | | | | | | | | | 1931Q3 |
| British West Indies | | | | | | | | | 1931Q3 |
| Bulgaria | | | | 1931 | 1931 | | N/A | Oct-31 | no devaluation |
| Canada | Oct-31 | Sept-31 | Sept-31 | 1931 | 1931 | Jul-31 | | Sept-31 | 1931Q3 |
| Chile | Apr-32 | Apr-32 | Apr-32 | 1932 | 1931 | Jul-31 | | Apr-32 | 1932Q2 |
| China | | | | | | | | | no devaluation |
| Colombia | Sept-31 | Jan-32 | | | | | | | 1932Q1 |
| Costa Rica | | Jan-32 | | | | | | | 1932Q1 |
| Cuba | Nov-33 | Apr-33 | | | | | | | 1933Q2 |
| Czechoslovakia | | Feb-34, | | 1931 | 1931 | | Sept-31 | Feb-34, & Oct-36 | 1934Q1 |
| Danzig | | May-35 | | | | | | | 1935Q2 w/POL |
| Denmark | Sept-31 | Sept-31 | Sept-31 | 1931 | 1931 | Sept-31 | | Sept-31 | 1931Q3 |
| Dutch Indies | Sept-36 | Sept-36 | | 1936 | 1936 | | | Sept-36 | 1936Q3 |
| Dutch West Indies | | | | | | | | | 1936Q3 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ecuador | Feb-32 | Jun-32 | | | | | | | 1932Q2 |
| Egypt | Sept-31 | Sept-31 | | | | | | | 1931Q3 |
| Estonia | Jun-33 | Jun-33 | | 1931 | 1931 | | | Jun-33 | 1933Q2 |
| Ethiopia | | | | | | | | | 1934Q1 |
| Finland | Oct-31 | Oct-31 | Oct-31 | 1931 | 1931 | Oct-31 | | Oct-31 | 1931Q4 |
| France | | Sept-36 | | 1936 | 1936 | Sept-36 | Sept-36 | Sept-36 | 1936Q3 |
| French East Africa | | | | | | | | | 1936Q3 |
| French East Indies | | | | | | | | | 1930Q1 |
| French North Africa | | | | | | | | | 1936Q3 |
| French Oceania | | | | | | | | | 1936Q3 |
| French West Africa | | | | | | | | | 1936Q3 |
| French West Indies | | | | | | | | | |
| Germany | | | | 1931 | 1931 | Jul-31 | Jul-31 | N/A | no devaluation |
| Greece | Apr-32 | Apr-32 | | | | | | | 1932Q2 |
| Guatemala | | Apr-33 | | | | | | | 1933Q2 |
| Honduras | | Apr-33 | | | | | | | 1933Q2 |
| Hong Kong | | | | | | | | | no devaluation |
| Hungary | | | | 1931 | 1931 | Aug-31 | Jul-31 | N/A | no devaluation |
| India | Sept-31 | Sept-31 | Sept-31 | 1931 | 1931 | Sept-31 | | Sept-31 | 1931Q3 |
| Iran | | | | | | | | | no devaluation |
| Irish Free State | Sept-31 | Sept-31 | | | | | | | 1931Q3 |
| Italy | | Mar-34 | Oct-36 | 1934 | 1934 | Dec-34 | May-34 | Jul-35, & Oct-36 | 1934Q1 |
| Italian Africa | | | | | | | | | 1934Q1 |
| Japan | Dec-31 | Dec-31 | Dec-31 | 1931 | 1931 | Dec-31 | | Dec-31 | 1931Q4 |
| Latvia | Sept-36 | Sept-36 | | | | | | | 1936Q3 |
| Lithuania | Oct-35 | | | | | | | N/A | no devaluation |
| Luxembourg | | Mar-35 | | | | | | | 1935Q1 w/BEL |
| Madagascar & Reunion | | | | | | | | | 1936Q3 |
| Malaya (British) | Sept-31 | Sept-31 | | | | | | | no devaluation |
| Mauritius & Seychelles | | | | | | | | | 1931Q3 |
| Mexico | Jul-31 | Aug-31 | | | | | | | 1931Q3 |
| Netherlands | Sept-36 | Sep-36 | | 1936 | 1936 | | | Sep-36 | 1936Q3 |
| New Zealand | Sep-31 | Apr-30 | Apr-30 | 1931 | 1930 | Apr-30 | | Sep-31 | 1930Q1 w/AUS |
| Nicaragua | Nov-31 | Jan-32 | | | | | | | 1932Q1 |
| Norway | Sept-31 | Sept-31 | | | | | | | 1931Q3 |
| Palestine | Sept-31 | Sept-31 | | | | | | | 1931Q3 |
| Panama | | Apr-33 | | | | | | | 1933Q2 |
| Paraguay | | Nov-29 | | | | | | | 1929Q2 w/URG |
| Peru | May-32 | May-32 | May-32 | 1932 | 1932 | | | May-32 | 1932Q2 |
| Philippines | | Apr-33 | | | | | | | 1933Q2 |
| Poland | | | | 1936 | 1936 | | Apr-36 | Oct-36 | 1935Q2 w/DAN |

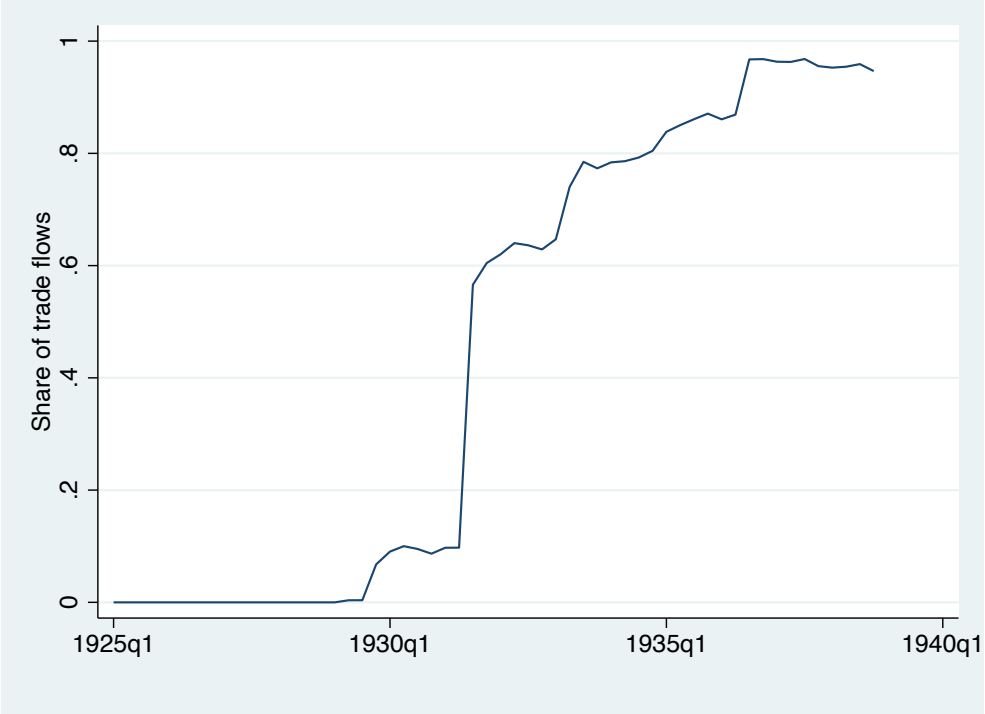
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Portugal | Dec-31 | Oct-31 | | | | | | | 1931Q4 |
| Portuguese Africa | | | | | | | | | 1931Q4 |
| Portuguese Asia | | | | | | | | | 1931Q4 |
| Puerto Rico | | | | | | | | | 1933Q2 |
| Romania | | Jul-35 | | 1932 | 1932 | | | Jul-35 | 1935Q3 |
| El Salvador | Oct-31 | Oct-31 | | | | | | | 1931Q4 |
| Siam | May-32 | Jun-32 | | | | | | | 1932Q2 |
| Spain | | 1920 | | | | | | | not on gold |
| South Africa | Dec-32 | Jan-33 | Jan-33 | 1931 | 1933 | Jan-33 | | Dec-32 | 1933Q1 |
| Sweden | Sep-31 | Sep-31 | Sep31 | 1931 | 1931 | Sep-31 | Sep-31 | Sep-31 | 1931Q3 |
| Switzerland | | Sep-36 | | 1936 | 1936 | | | Sep-36 | 1936Q3 |
| Syria | | | | | | | | | 1936Q3 |
| Turkey | | 1915 | | | | | | | not on gold |
| UK | Sep-31 | Sep-31 | Sep-31 | 1931 | 1931 | | | Sep-31 | 1931Q3 |
| US | Apr-33 | Apr-33 | Apr-33 | 1933 | 1933 | Apr-33 | | Apr-33 | 1933Q2 |
| USSR | | Apr-36 | | | | | | | 1936Q2 |
| Uruguay | Dec-29 | Apr-29 | | | | | | | 1929Q2 w/PAR |
| Venezuela | | Sept-30 | | | | | | | 1930Q3 w/GUIA |
| Virgin Islands | | | | | | | | | 1933Q2 |
| Yugoslavia | | Dec-32 | | | | | | | 1932Q4 w/ALB |

Sources: League of Nations (1937, p. 16), Brown (1940, p. 1075), Kemmerer (1954), Officer (2008), Obstfeld and Taylor (2003), Wolf (2008), Ellison, Lee and O'Rourke (2021).

Figure A.1: Share of country pairs and share of exports that are affected by the treatment



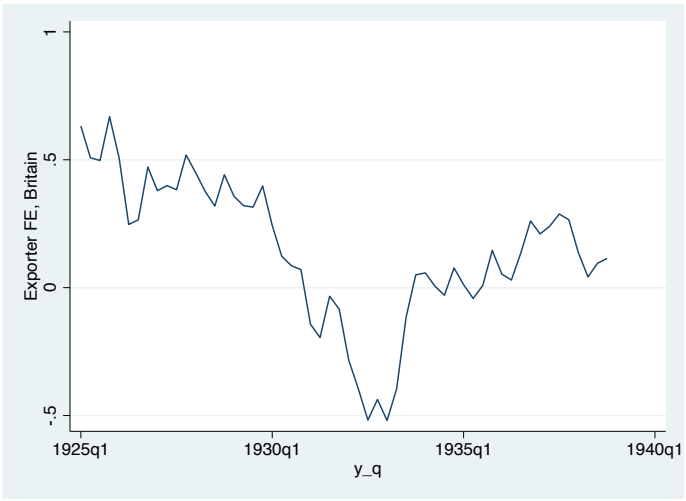

(a) Share of country pairs



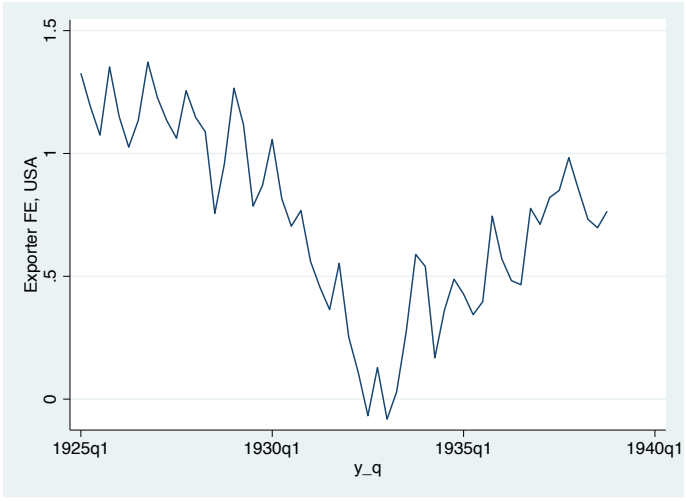

(b) Share of export flows

Note: Authors' calculations using data described in the text.

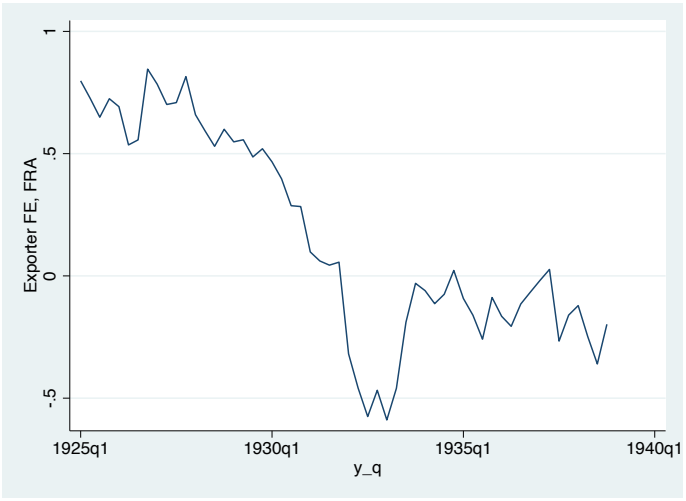
Figure A.2: Exporter-time fixed effects for individual sample countries




(a) Britain




(b) USA




(c) France

Note: Authors' calculations using data described in the text.