Currency Wars and Monetary Regime Disintegration

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Abstract

The Great Depression is the canonical case of a widespread currency war, with more than 70 countries devaluing between 1929 and 1936. Existing scholarship, however, has largely focused on the beggar-thy-neighbor effects of devaluations rather than their collective effect on the disintegration of the interwar gold standard. 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 relative to its trade partners that had yet to devalue. 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 frictions.

JEL: F14, F33, F42, N10, N70

Keywords: currency war, monetary regimes, gold standard, competitive devaluations, "beggar thy neighbor," gravity model

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I. Introduction

Concerns about a "currency war" surfaced in the wake of the Global Financial Crisis, when many economies were grappling with economic downturns and searching for policy responses to them. 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 are, in fact, not new. Indeed, the canonical case may be the Great Depression, which saw economies around the world abandon their pegs to gold in large numbers and devalue their currencies. Many observers of the time saw this as an attempt to export unemployment abroad and were concerned about a potential race to the bottom in currency values. Economies were drawn into conflict through so-called "competitive devaluations," with more than 50 countries devaluing in the early 1930s. Others saw an equally ominous spillover: widespread devaluation would lead to the collapse of the international monetary system of pegged exchange rates that were convertible into gold.

Despite its notoriety, there is little research examining how the first worldwide currency war affected world trade. In this paper, we focus our lens on the global question rather than the domestic one, and ask whether the large-scale currency war of the early 1930s reduced overall trade flows. 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 recovery in domestic prices, wages, industrial production, and exports (Eichengreen and Sachs 1985; Campa 1990). More recently, Candia and Pedemonte (2021) examine U.S. cities and find that those with

[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.

more production exposure to the U.S. devaluation in 1933 recovered more quickly from the Great Depression. By contrast, however, comparatively little is known about the extent to which the currency war of the 1930s contributed to the enormous collapse in world trade that occurred in that decade.

Contemporaries frequently 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. Indeed, none other than Joan Robinson worried that devaluations and other domestic policy measures (i.e., wage reductions, protection, and export subsidies) designed to improve a country's trade balance would lead to devaluations by others, causing "the total volume of international trade [to] sink continuously, relative to the total volume of world activity" (Robinson 1937, p.211). Uncoordinated and domestically-oriented "beggar-thy-neighbour policies" (as she called them) could thus end up being collectively destructive to global trade. Writing as Bretton Woods was being formulated, Ragnar Nurkse similarly argued that exchange-rate instability in the 1930s was a root cause of the decline in global trade during that decade (Nurkse 1944). Later generations of economic historians followed suit by noting the possibility of deleterious effects (Kindleberger 1986). However, quantitative estimates demonstrating the impact of widespread devaluations 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. Contemporaries were clearly aware of the system's benefits, which included regime coordination, exchange-rate stability, and a multilateral payments system that reduced trade frictions.

Using gravity models as a theoretically-grounded empirical approach, this paper aims to fill this lacuna by examining how bilateral trade flows responded to the sweeping devaluations of the Great Depression. A key barrier to entry in analyzing the effects of the canonical case of a currency war has been the lack of high-frequency trade data for the interwar period. To overcome this hurdle, we utilize a recently-assembled database spanning 1925-1938 that contains more than 105,000 observations of bilateral trade flows for 99 economies and that encompasses roughly 90% of global trade. 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.

To be clear, our objective is to provide provide causal estimates of the impact of the global currency war on trade flows rather than to shed light on the domestic or "beggar-thy-neighbor" effects of these devaluations. We thus leverage differences in the timing of devaluations to study the trade of belligerents in the currency war (i.e., those that devalued) with non-belligerents (those that had not yet devalued). That is, at a given point in time, we estimate whether there was a significant difference in a belligerent devaluer's trade to its trade partners that had yet to devalue versus those that had already done so. For a given trade pair, this differential impact is estimated up until the point when a "non-belligerent" trade partner also devalues, at which time the country is re-classified as a belligerent and our estimation strategy "turns off" the devaluation effect for the particular trade pair.

By including importer-time, exporter-time, and trade-pair fixed effects in our estimated gravity models, we are able to control for a variety of potential confounders, including domestic policies that were enacted to offset the effects of the Great Depression, across-the-board increases in tariff and non-tariff barriers to trade, and factors (including distance and contiguity) leading to more or less trade between countries over time. Since our estimates include exporter-time and importer-time fixed effects, we control for the effects of a country's decision to devalue its currency against *all* its trade partners as well as the general decline in trade in the 1930s (e.g., that driven by falling aggregate demand). In short, we measure the differential impact of devaluation on its trade with those countries not themselves devaluing to identify the impact of a currency war on trade flows.

Our baseline PPML results show that, on average, trade to non-devaluers declined by 21%. 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 Bloc, being a participant in the Smoot-Hawley trade war, or experiencing a currency crisis. One interpretation of this negatively-signed result is that currency wars unwind the trade-enhancing effects of international monetary systems. 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 also appears to be true: the currency war of the 1930s led to the dissolution of the interwar gold standard and reduced trade. As countries abandoned their fixed parities to gold, regime coordination declined and transactions costs and payments frictions rose.

This interpretation is consistent with 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's main question expands on their result in that we are interested in assessing whether the mother of all currency wars that occurred in the first half of the 1930s had immediate effects on global trade – when trade was still declining precipitously – rather than looking at 1938, when trade flows had already begun to recover and *after* the interwar gold standard had already collapsed. As a result, our methodological approach differs in several ways. First, we estimate panel gravity models that include all the fixed effects required by modern theory rather than just country fixed effects. 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 – an issue not evaluated in their study but central to the more general question of how currency wars impact trade.

Our paper 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. 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. Our estimated effects are roughly double in size to Rose's estimates for the currency war of the late 2000s and 2010s. Third, and also related to the larger estimates for the 1930s, we focus on a currency war that had an important institutional consequences: the dissolution of an international monetary system. 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.

Our paper differs from the large literature (both historical and focused on the present) on beggar-thy-neighbor devaluations, which focuses on how competitive devaluations impact domestic output, prices, and a nation's overall trade (as in recent work by Bouscasse (2022)).[3] For example, 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 and Gourinchas 2021). Depreciation was 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.[4] Our analysis of a full-fledged currency war that resulted in the decline of an international monetary system provides a different context for understanding the effects on trade flows, and emphasizes how negative spillovers can occur when many countries devalue within a short time span. Our research suggests that, the global currency war caused a large decline in international trade. Regime coordination and reduced transaction costs gave way to fluctuating

[3]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).

[4]For an example of a model that delivers the opposite result of a devaluation's effects on domestic demand and output, see Krugman and Taylor (1978).

exchange rates and reduced trade flows.

In the next section of the paper, we briefly describe the historical context in which the currency war of the 1930s erupted. Sections 3, 4, and 5 describe our data, empirical results, and robustness checks. Section 6 concludes.

II. Historical Context

From 1929 to 1936, over 70 countries devalued their currencies. The first economies to leave the interwar gold standard and devalue were primary-product producers, such as Argentina, Brazil and Uruguay (see online Appendix), 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 1933. Other economies, notably the members of the Gold Bloc (France, Switzerland, Belgium, the Netherlands, 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.

III. Data

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).

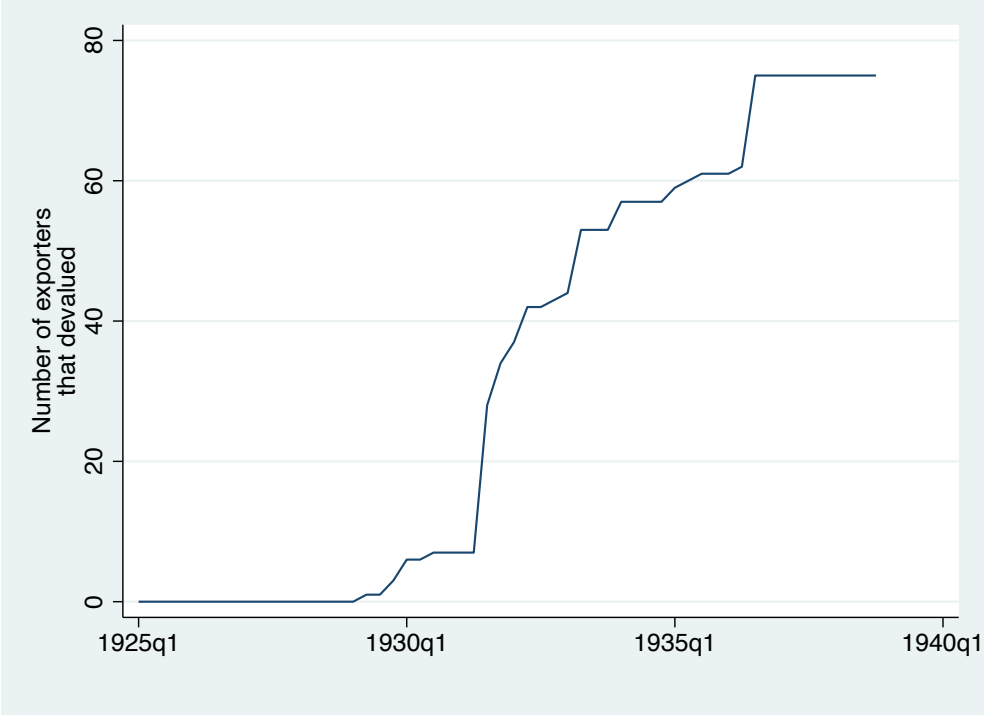
The unbalanced panel contains 105,922 raw observations on the value of bilateral trade flows. Where necessary, we take advantage of "duplicate" observations (i.e., the fact that exports from country i to country j can also be represented as imports into country j from country i) to obtain the largest 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 the online Appendix 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 uniquely interested in 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).

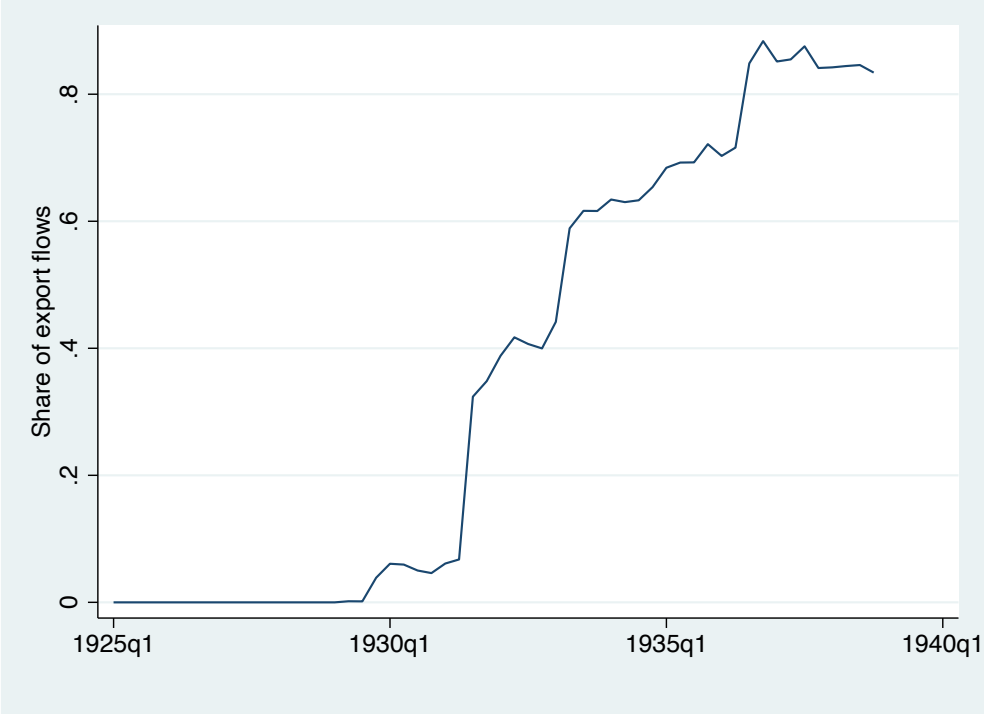
The top panel of Figure 1 shows when devaluations occurred.[5] Consistent with the discussion in the previous section, the first significant wave of devaluations occurred in third quarter of 1931. A second bump occurred in 1933, when the US left the gold standard; a third group of countries left the gold bloc in 1936. By that year, more than 50 economies had devalued. As noted in the introduction, this number constitutes far more global combatants than the currency war of the

[5]Due to the nature of the trade data, some countries are combined (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.

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.

2010s – and provides a key aspect of the empirical setting that is of interest to those wanting to understand whether, on average, currency wars produced deleterious effects on global trade.[6]

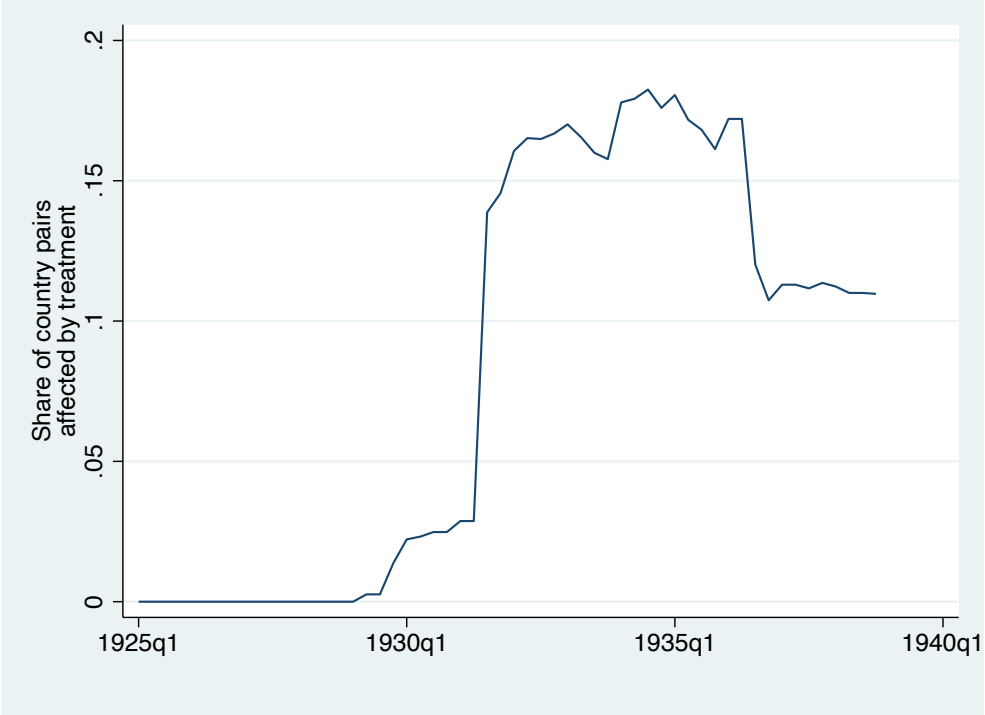
Comparing the number of countries devaluing with the share of exports originating from them, the bottom panel of Figure 1 shows that after Britain and the Sterling Area devalued, about 40% of trade flows were coming from countries that had already abandoned their pre-1929 pegs to gold. This share increased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

To identify the effect of devaluation on trade flows, we generate a dummy variable that is equal to 1 when an exporter devalues in a given country pair, but returns to zero when the corresponding trade partner also devalues. By construction, we only capture the effect of the initial devaluation with respect to trade partners that have not yet devalued. For example, we will be measuring the impact of Uruguay's December 1929 devaluation on its trade with the UK; the UK's September 1931 devaluation on its trade with the US; and the US's April 1933 devaluation on its trade with the Gold Bloc countries.

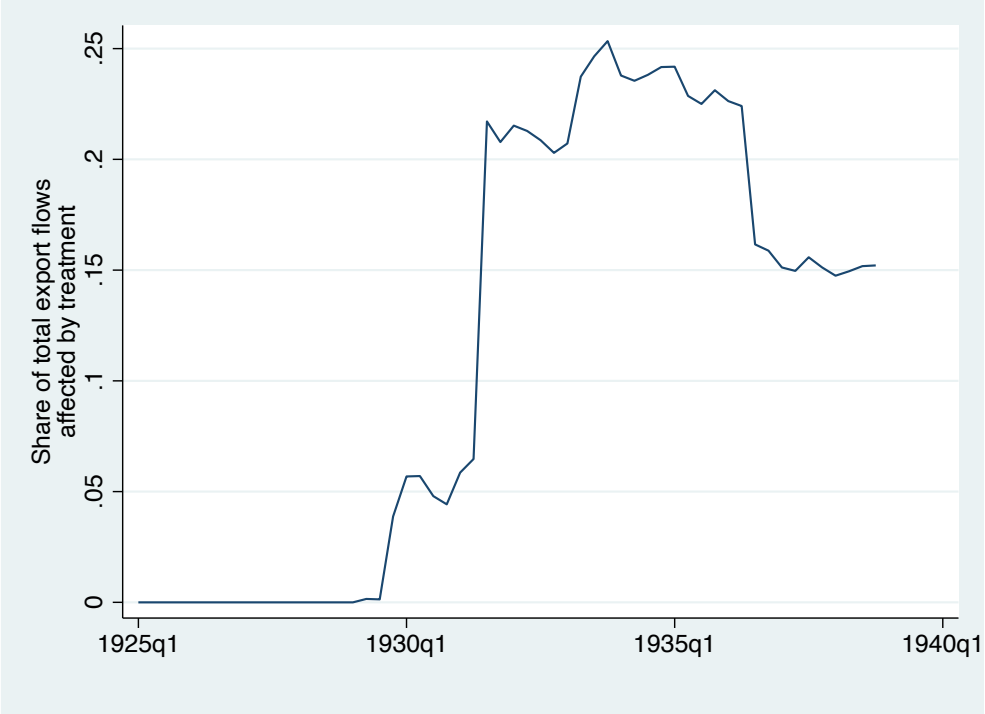
As pointed out by Bénassy-Quéré et al. (2014), since all devaluations do not occur simultaneously (i.e., regime coordination collapses), a currency war will create winners and losers from devaluation. It follows that an exporter hoping to gain a competitive edge from reducing its export prices via the devaluation, will largely benefit only as long as the trade partner has not yet devalued; the benefit ought to diminish thereafter. Figure 2 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 the exporter has devalued but the importer has not yet done so. 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 2b that the share of global trade affected by treatment follows the same pattern. At the height of the devaluations, roughly 20% of world trade flows in our sample were affected.

[6] 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 are eventually affected by devaluations.

Figure 2: 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.

IV. Gravity Model Estimates

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

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

where X_{ijt} represents nominal trade flows from i to j in period t; δ_{it} is a series of time-varying exporter fixed effects accounting for anything systematically raising or lowering exports from i over time; δ_{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 δ_{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 β, which consists of the product of two indicator variables. $Devalue_{it}$ is a dummy variable which switches on in the quarter t when country i devalues and remains equal to one thereafter; it is zero otherwise. Similarly, $OnGold_{jt}$ is a dummy variable that is equal to one when country j is on gold, but switches to zero if country j devalues in quarter t; it remains zero thereafter. The product of the two indicator variables is equal to 1 only during the interval of time in which country i has devalued but j has not. To be clear, β thus measures the impact on trade flows from i to j of a devaluation of i that is yet to matched by a devaluation by j.

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, 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. 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.

The first two columns of Table 1 display the estimates of equation 1 using Poisson pseudo-maximum likelihood (PPML) (following Santos Silva and Tenreyro (2006)) and include all quarterly observations. Overall, the model appears to fit well as indicated by the high pseudo R-squared of 97%. 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). The estimated coefficient on β from Equation 1 is negative and statistically significant. When a country devalues, trade to its trade partners that have yet to devalue falls by an average of 25%.[7] From the perspective of a beggar-thy-neighbor argument, the negative sign on devaluation sign might seem counterintuitive since a change in the price of exports relative to competing imports could lead to an overall increase in exports. Recall, however, that our estimated gravity equation includes exporter-time fixed effects. Their inclusion controls for the average effect on country $i's$ trade across all trade partners at the time of devaluation – typically how the literature has estimated a beggar-thy-neighbor effect.[8] By contrast, our estimated coefficient captures the average effect of devaluation with respect to trade partners that have yet to devalue. As noted earlier, this set up allows us to focus on a different but equally important set of issues: (1) how currency wars affect international trade flows and (2) how global trade responds when many countries devalue and essentially abandon a global fixed-exchange rate system. In our context of a full-fledged currency war, devaluation may generate negative spillovers to global trade flows. Indeed, our estimates suggest that, on average, a country's decision to devalue erodes international trade, a finding consistent with the dramatic

[7] 100x(1-exp(-0.289)) = 25.1%. The results of the baseline regression are robust to the incidental parameter bias that emerges in "three-way" fixed effects Poisson Pseudo-Maximum Likelihood (Weidner and Zylkin 2021). Results of the bias correction are available upon request from the authors.

[8] Their inclusion also accounts for policies that may have been directed at all trade partners. 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.

rise in trade costs in the early 1930s (Jacks, Meissner, and Novy 2008). Column 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 β remains negative. As expected, the additional covariates slightly reduce the magnitude of the effect, showing an average decline in trade of 21% after devaluation. The result maintains its statistical significance. In other words, these baseline results provide evidence consistent with the interpretation that the currency war disrupted the multilateral payments system and regime stability of the interwar gold standard and reduced trade.

Because colonial devaluation decisions may not be independent of those of the metropole, Column 3 excludes colonies altogether and presents results on trade between the 59 sovereign countries in our sample. Even when we focus on country trade, the effects are similar to those reported in the previous columns, suggesting that the results on devaluation's effects on trade are not sensitive to the inclusion of the colonies.

Table 1: Estimating the Effects of Devaluation on Trade Flows, Extensive and Intensive Margin

	(1)	(2)	(3)	(4)	(5)	(6)
		Extensive Margin			Intensive margin	
	Baseline	Baseline	Sovereign	Baseline	Baseline	Sovereign
VARIABLES		+ Controls			+ Controls	
Devaluation (Exporter only)	-0.287***	-0.242***	-0.227***			
	(0.0402)	(0.0418)	(0.0447)			
Devaluation (Parity)				-0.424***	-0.329**	-0.298**
				(0.134)	(0.133)	(0.138)
Observations	105,701	105,701	71,496	75,824	75,824	67,244
Controls	NO	YES	YES	NO	YES	YES
ExporterTimeFE	YES	YES	YES	YES	YES	YES
ImporterTimeFE	YES	YES	YES	YES	YES	YES
PairFE	YES	YES	YES	YES	YES	YES
Pseudo R-squared	0.976	0.977	0.978	0.976	0.977	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.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 1 also considers the effects of devaluations on the intensive margin. Instead of using an indicator variable to code the effects of a devaluation, we recode it 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, once a particular trade partner responds by changing its exchange rate, the effect is "turned off" for that pair (i.e., the difference in parities is set to 0). Until the time the trade partner responds, any additional changes in the exporter's parity value vis-a-vis this trade partner are captured as well (i.e., coding for an individual pair can over time once the exporter devalues up until the time at which the effect is "turned off.") 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 percent change relative to the difference in the trade pair's pre-devaluation gold parities. [9]

Using this new independent variable, columns 4–6 in Table 1 then repeat the baseline regressions. Columns 4 and 5 show that for a country that devalues, average trade fell by between 28% and 35%. One interpretation of the relatively larger effect on trade in comparison to the extensive effects shown in the first part of the table is that quantitatively larger movements potentially increased exchange-rate volatility and thereby exacerbated trade frictions. The size and significance of the effect also holds when restricting the sample to trade among the sovereign countries (Column 6). Again, the effect is smaller than in the baseline regression, suggesting that rising trade frictions associated with the dissolution of the gold standard affected the periphery by more.

V. Robustness

Table 2 further examines how devaluations influenced trade flows. The first column examines whether the estimated negative effect is driven by retaliatory quotas aimed at trade partners that devalued. Albers (2020) suggests that some countries that stayed on gold longer, Gold Bloc members such as France and Switzerland, retaliated against devaluers by imposing quotas and changing commercial policy.[10] If retaliation is driving the result, then by including time-varying

[9] For example, Great Britain devalues with respect to the USA in September 1931. The intensive margin "turns on" in 1931Q3 and takes on values of 0.022, 0.246, 0.278, 0.240, 0.280, 0.317, 0.297, before turning to zero again in 1933Q2.

[10] 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

bilateral quotas, the coefficient on this variable should be negative and statistically significant and the devaluation effect should be statistically insignificant. Column 1 suggests that the effect of quotas is not statistically significantly different from zero, while devaluation stays negative and statistically significant (though slightly smaller in magnitude). Column 1's results further suggest that our findings are consistent with the view that the negative effect on trade is arising from the disintegration of the international monetary standard or the flipside of what scholars have found when the classical gold standard was formed in the late nineteenth century (Lopez-Cordova and Meissner 2003).

Table 2 considers additional robustness checks. Column 2 of Table 2 presents results excluding the UK and the U.S. – two global trade and monetary powers in the interwar period. Here again, the results are negative, statistically significant, and if anything, even larger than our baseline results. (The average effect of devaluation is a 29% decline in trade.) This finding suggests that the increased trade frictions associated with devaluation and lack of regime coordination had even stronger effects on the periphery of the interwar gold standard. To further test this result, Column 3 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. (The number of observations is about 12% of the original sample, highlighting the large amount of global trade in the interwar period that involved Europe and North America.) The coefficient of interest shows a large decline of 45%. The dissolution of the international system of pegged rates appears to have increased trade frictions even more in the periphery, raising trade costs disproportionately in economies that were very reliant on global trade. Finally, for comparison with the literature on the linkage between general devaluation and recovery from the Depression, Column 4 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, again suggesting that the effects of monetary disintegration were more adverse in the non-European periphery, but still

policy change by including importer-time fixed effects.

negative and statistically significant at conventional levels.[11]

A country's decision to devalue might not be made in isolation. Countries might respond to the exchange rate choices of their main trade partners. This could especially have been true during the interwar gold standard, where 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 in the periphery. To account for this possibility, for each country in our sample, we identify its 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.During our sample period, Britain 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 USA 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. Column 5 of Table 2 displays results excluding these main export partners from the estimation. The table shows that the 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 policy.

An additional econometric concern might be 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. The aggregated average treatment on the treated (where each quarter produces a cohort-specific ATT) has yet to be estimated in a gravity setting with a full set of interactions. Nevertheless, 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 6 in Table 2 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

[11]By sequentially dropping individual countries, 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.

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 6.

Although the paper's primary goal is to estimate causal 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.[12]

Similarly, the potential effects of devaluation likely changed over time. It is reasonable to assume that the benefits of the gold-exchange standard vary with the size of the network and that early devaluers might have experienced the largest losses. Table 3 shows the effect of devaluation where we use two currency blocs, the sterling bloc and the gold bloc, to examine whether the size of the estimated effect on trade flows varies with the timing of devaluations. The sterling bloc includes the countries that devalue when Britain devalues in September 1931, while the gold bloc consists of countries grouped around France that remain on gold until 1936. Using the coefficients reported in column 2 (where time-varying, pairwise controls are included), the decline in trade for the sterling bloc devaluers is approximately 80% larger than for gold bloc devaluers, indicating that earlier combatants in the currency war experienced significantly more trade loss. Early devaluers thus miss out on the benefits of a large fixed exchange rate network whereas the later leavers suffer smaller losses because the gold-exchange standard had already deteriorated.

[12]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.

Table 2: Robustness Checks

VARIABLES	(1) Import Quotas	(2) Excluding UK and US	(3) Periphery	(4) Eichengreen and Sachs	(5) Drop Main Trade Partner	(6) Devalue by 1931Q3
Devaluation(Exporter only)	-0.198***	-0.349***	-0.593***	-0.187***	-0.236***	-0.0932*
	(0.0548)	(0.0508)	(0.187)	(0.0465)	(0.0420)	(0.0566)
Observations	105,701	85,848	13,051	25,917	100,546	93,168
Controls	YES	YES	YES	YES	YES	YES
ExporterTimeFE	YES	YES	YES	YES	YES	YES
ImporterTimeFE	YES	YES	YES	YES	YES	YES
PairFE	YES	YES	YES	YES	YES	YES
Pseudo R-squared	0.977	0.967	0.978	0.985	0.974	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.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3: Currency Blocs

VARIABLES	(1) flow	(2) flow
Devaluing Country in Gold Bloc	-0.184**	-0.144**
	(0.0728)	(0.0638)
Devaluing Country in Sterling Bloc	-0.327***	-0.276***
	(0.0575)	(0.0519)
Devaluing Country in no Bloc	-0.269***	-0.256***
	(0.0552)	(0.0548)
Observations	105,701	105,701
Controls	NO	YES
ExporterTimeFE	YES	YES
ImporterTimeFE	YES	YES
PairFE	YES	YES
Pseudo R-squared	0.976	0.977

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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

As a final robustness check, we consider the possibility that exchange controls, which became widespread in the 1930s, were sometimes used as an alternative to devaluation (Eichengreen and Irwin 2010) and thus may have altered trade flows. Table 4 thus codes two new dummy variables for countries that are still on gold. The first takes a value of one when both trade partners have imposed exchange controls and have yet to devalue. The second takes a value of one when only one partner has imposed an exchange control prior to devaluation. When country i then devalues, the exchange control indicator reverts to zero. The estimated coefficient in the first row of the table show that the statistical significance of the devaluation effect is not affected by the inclusion of these two exchange-control indicator variables. Moreover, the sign on devaluation effect remains negative and the size is roughly comparable to our baseline estimates presented in Table 1. Exchange controls themselves appear to have had no significant effect on trade flows.

Table 4: Controlling for Exchange Controls

VARIABLES	(1) Baseline	(2) Extensive Margin Baseline + Controls
Devaluation(Exporter only)	-0.259***	-0.211***
	(0.0363)	(0.0381)
Both Trade Partners Impose Exchange Controls	0.271	0.259
	(0.352)	(0.355)
One Trade Partner Imposes Exchange Controls	0.0620	0.0481
	(0.174)	(0.176)
Observations	105,701	105,701
Controls	NO	YES
ExporterTimeFE	YES	YES
ImporterTimeFE	YES	YES
PairFE	YES	YES
Pseudo R-squared	0.976	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. Conclusion

It has been argued that the 1930s was a period without economic leadership (Kindleberger 1986). 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. Moreover, with Britain's devaluation in 1931 and the U.S.'s in 1933, any sense of regime coordination had come to an end. 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. 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.

How consequential was this collective abandonment of the interwar gold standard? In terms of trade, quite so. With more than 50 economies devaluing, the mother of all currency wars erupted, causing a meltdown in global trade. Using a new quarterly bilateral trade dataset, we conservatively estimate that the currency war reduced trade by at least 20% on the extensive margin and even more (up to 35%) when taking into account the size of the devaluations. From a global perspective, this loss was sizable as it came on top of trade that was already spiraling downward from depressed demand. 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. Rather, our results provide an additional reason why global trade fell precipitously in the 1930s — 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.

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A Online Appendix Table: Summary of Devaluations

	League of Nations (1937)		Brown Kemmerer Officer OT Wolf					Ellison et al.	Our Coding
Country	Official suspension of gold	Depreciation or devaluation in relation to gold	Departure from gold					Departure from gold	Departure
Albania									no devaluation w/YUG
Argentina	Dec-29	Nov-29	Nov-29	1929	1929	Dec-29			1929Q4
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
Bolivia	Sept-31	Mar-30							1930Q1
Brazil		Dec-29	Dec-29	1930	1929	Dec-29		Dec-29 & Oct-30	1929Q4
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
Ecuador	Feb-32	Jun-32							1932Q2
Egypt	Sept-31	Sept-31							1931Q3
Estonia	Jun-33	Jun-33		1931	1931			Jun-33	1933Q2
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
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
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
Malaya	Sept-31	Sept-31							no devaluation
(British)									
Mexico	Jul-31	Aug-31							1931Q3
Netherlands	Sept-36	Sep-36		1936	1936			Sep-36	1936Q3
Netherlands	Sept-36	Sept-36							no devaluation
Indies									
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
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
Turkey		1915							not on gold
South Africa	Dec-32	Jan-33							1933Q1
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
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).