

Original citation:

Mitchener , Kris James and Wandschneider , Kirsten (2013) Capital controls and recovery from the financial crisis of the 1930s. Working Paper. Coventry, UK: Department of Economics, University of Warwick. (CAGE Online Working Paper Series).

Permanent WRAP url:

<http://wrap.warwick.ac.uk/59213>

Copyright and reuse:

The Warwick Research Archive Portal (WRAP) makes this work of researchers of the University of Warwick available open access under the following conditions. Copyright © and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable the material made available in WRAP has been checked for eligibility before being made available.

Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

A note on versions:

The version presented here is a working paper or pre-print that may be later published elsewhere. If a published version is known of, the above WRAP url will contain details on finding it.

For more information, please contact the WRAP Team at: publicatons@warwick.ac.uk

June 2013

No.132

**Capital Controls and Recovery from the Financial Crisis
of the 1930s**

Kris James Mitchener and Kirsten Wandschneider

WORKING PAPER SERIES

Centre for Competitive Advantage in the Global Economy

Department of Economics

Capital Controls and Recovery from the Financial Crisis of the 1930s

Kris James Mitchener
University of Warwick
& NBER

Kirsten Wandschneider
Occidental College*

April 2013

JEL Codes: F32, F33, F41, N1, N2, E44, E61, G15

Keywords: capital controls, financial crises, Great Depression, interwar gold standard

We examine the first widespread use of capital controls in response to a global or regional financial crisis. In particular, we analyze whether capital controls mitigated capital flight in the 1930s and assess their causal effects on macroeconomic recovery from the Great Depression. We find evidence that they stemmed gold outflows in the year following their imposition; however, time-shifted, difference-in-differences (DD) estimates of industrial production, prices, and exports suggest that exchange controls did not accelerate macroeconomic recovery relative to countries that went off gold and floated. Countries imposing capital controls also appear to perform similar to the gold bloc countries once the latter group of countries finally abandoned gold. Time series regressions further demonstrate that countries imposing capital controls refrained from fully utilizing their newly acquired monetary policy autonomy. Even so, capital controls remained in place as instruments for manipulating trade flows and for preserving foreign exchange for the repayment of external debt.

* We thank conference and seminar participants at Oxford University, UC Davis, and the Bank of Norway-Graduate Institute of International Studies Conference for useful suggestions. Melissa Daniel and Rose York provided invaluable research assistance.

Capital Controls and Recovery from the Financial Crisis of the 1930s

1. Introduction

In 2010, the International Monetary Fund (IMF) revised its stand against capital controls, recognizing that sudden capital surges can pose risk for some countries, and acknowledging that controls on capital inflows may be part of a toolkit that countries use to ward off financial crises (Ostry et al, 2010). This change in policy reverses the previous IMF position that favored free capital flows.¹ Nevertheless, the use of capital controls as a policy tool, especially as a stopgap to ward off financial crises, remains controversial. For example, in 1998, Malaysia was castigated by policymakers and financial markets for imposing capital controls in response to the East Asian financial crisis.

Since capital controls have been used in response to exchange-rate crises, understanding their macroeconomic effects relative to other policies is an important agenda for research. On the one hand, exchange controls bottle up capital inflows, thus potentially hindering a recovery driven by investment spending. On the other, their imposition could provide central banks with room for maneuver; in particular, central banks can maintain fixed exchange rates, but pursue expansionary monetary policy in the short run to stimulate output and return to long-run policy objectives. Research on the 1997-8 East Asian financial crisis has suggested that restrictions on the movement of capital may have produced a faster economic recovery in comparison to countries that relied on help from the IMF (Kaplan and Rodrik, 2002).

Determining the relative benefits and costs of capital controls for economic recovery is ultimately an empirical question, and the Great Depression offers a potentially fertile testing ground for shedding light on this issue. Deflation spread globally after 1929, and as production and incomes fell, countries found it increasingly difficult to maintain pegged exchange rates. By the mid-1930s, most had abandoned the gold-exchange standard and were seeking refuge in a variety of alternative exchange-rate arrangements, including capital controls. The abandonment of gold, however, was carried out in a haphazard manner, with some countries following England off gold in 1931 and others steadfastly staying on gold until after 1933 (Eichengreen,

¹ For example, in 1998, in its World Economic Outlook, the IMF was critical of Malaysia's use of capital controls in response to the East Asian financial crisis (IMF, 1998, p.4). By 2011, deputy managing Director Nemat Shafik suggested that that Iceland keep its capital controls in place in response to the 2008-9 financial crisis (IMF, 2011).

1992, Kindleberger, 1986). Some chose to repeg at lower rates to particular currencies, such as the pound sterling, others floated their currencies, and many imposed exchange controls in order to shield their economies from the effects of short-term capital flows (“hot money”) and balance-of-payments pressures.

The Depression was the first financial crisis in the era of modern economic growth in which a large number of countries responded to balance-of-payments pressures by imposing restrictions on the movement of capital. Few, if any, financial crisis since the Depression have rivaled its severity and global impact, and few have witnessed so many countries responding by imposing capital controls, perhaps in part because many subsequent crises have been regional in nature (Glick and Rose, 1999). Previous research has found that de-linking from gold sped up recovery from the Great Depression (Choudhri and Kochin, 1980, Eichengreen and Sachs, 1985, Campa, 1990) and that imposing capital controls appears to have offered some relief from “golden fetters” (Obstfeld and Taylor, 1998). Extant studies, however, have yet to analyze systematically how countries imposing exchange controls performed relative to countries that exited gold and floated their currencies after abandoning the gold standard or those that stayed on gold even longer (the so-called “gold bloc”).

In order to fill these lacunae, we analyze the effects of capital controls on economic recovery in the 1930s by assembling a large, new monthly data set of macroeconomic variables and information on exchange rate and capital controls, spanning 1925-36, and containing of almost all the countries on the interwar gold standard. Our database classifies how and when countries abandoned the interwar gold standard as well as whether countries imposed exchange controls, enabling us to study counterfactuals and consider how the pace of recovery differed under alternative policy regimes.²

We first show that the capital controls achieved their primary, short-run objective of stemming capital outflows. Gold cover ratios for exchange-control countries stabilized in the months following the imposition of capital controls. We then explore the impact of capital controls on macroeconomic performance, following their imposition. Our empirical analysis take

² While the modern economics literature uses the term capital controls, the writings of the 1930s uniformly use the term exchange controls as restrictions originated in restrictions of purchases and sales of foreign and domestic currency at market rates. However, interwar exchange controls quickly grew to include different measures restricting trade, travel, and the repatriation of capital gains. We therefore use both terms synonymously for the remainder of the paper.

advantage of the variation in timing of going off gold and heterogeneous policy responses in order to estimate the causal effects of exchange controls on economic recovery from the Great Depression. We employ time-shifted, difference-in-differences estimators to account for bias arising from the variation in timing of going off gold (i.e., when treatment began).

Our results suggest that capital controls did not accelerate recovery from the Great Depression relative to countries that went off gold and floated. In examining the impact of capital controls on industrial production, exports, and prices, we only find statistically significant effects on industrial production. The estimated coefficient suggests that capital controls slightly reduced the rate of growth in industrial production relative to floaters. Countries imposing capital controls also appear to perform similar to the gold bloc countries with respect to output recovery and export growth, once the latter group of countries finally abandoned gold. Thus, while capital controls provided an immediate tool to combat capital flight, they appear have held no advantage over a free float, and likely even hindered recovery after they were imposed.

We explore the implications of our results – why capital controls did not stimulate recovery. Time series regressions suggest that countries imposing capital controls did not actively pursue expansionary monetary policy after abandoning gold. Pairwise regressions with base countries show no statistically significant change in bank rate or discount rate behavior after countries imposed exchange controls, suggesting little deviation from established policy paths. Historical narratives and data on gold outflows corroborate our statistical findings: countries initially imposed capital controls to ward off exchange-rate or banking crises, but refrained from using their newly-acquired monetary policy autonomy to reflate their economies. Instead, capital controls expanded as instruments to regulate trade and to preserve foreign exchange for paying external debts and staving off default.

The next section of the paper reviews existing research on exchange controls and relates it to the setting of this paper – the 1920s and 1930s. Section 3 employs a new panel level data set to quantify how capital controls influenced the paths of industrial production, exports, and prices relative to other policy regimes – countries that floated and countries that stayed on gold. Section 4 analyzes central bank policy rates to determine the extent to which countries exploited the “policy trilemma” and took advantage of the ability to conduct autonomous monetary policy once capital controls were imposed. It then discusses why capital controls were maintained once

gold outflows subsided. Section 5 summarizes our findings on the use of capital controls in the 1930s.

2. Capital Controls and the Great Depression

A. Costs and Benefits of Capital Controls

Capital controls limit the movement of currency and foreign exchange across borders. They come in many forms and are put in place with a variety of goals in mind.³ They share the feature of centralizing all dealings of foreign exchange in the hands of some government authority. The first widespread use of them occurred during World War I. At the outset of war, belligerents tried to slow down the repatriation of capital so that foreign exchange could be used for purchasing strategic imports. These controls were also used as a means for raising revenue via higher inflation (delinking to gold and printing money) and as a tool for taxing wealth (Bakker, 1996).

In this paper, we study restrictions that were put in place as a reaction to balance-of-payments pressures and, in particular, the threat of capital outflows.⁴ In currency crises, exchange controls are often employed as a response to anticipated or immediate danger of capital exports or repatriation of funds abroad. A League of Nations' study (1938, p.25) concluded that capital controls were initially adopted in the late 1920s and early 1930s in response to a deterioration in balance of payments conditions and observed or anticipated flight of capital.⁵

Some research has suggested capital controls have considerable utility in warding off financial crises. For example, Krugman (1998) argues that in the event of a crisis, temporary exchange controls can buy a country time to restructure its financial sector in an orderly fashion, lower interest rates, and put pro-growth policies in place.⁶ Others have pointed out that capital controls have a place in a world where free capital predominantly flows from poor to rich

³ For example, controls might be used to limit outflows of capital for balance of payments reasons, to preserve domestic savings or to allocate capital to specific sectors of the economy.

⁴ There is an equally large literature on the use of capital controls to ward off capital inflows, such as the use of them to limit real currency appreciations (Neely, 1999, and Johnston and Tamirisa, 1998).

⁵ Ellis (1947, p. 878-9) suggests that during the 1930s the most common form of exchange control was enforcement of overvalued exchange rates as a device to avoid depreciation, which would have ensued because of the withdrawal or flight of capital from debtor countries. Exchange controls were thus used to defend a particular exchange rate and ward off capital flight.

⁶ Klein (2012), however, finds "episodic" capital controls used recently to regulate inflow-fueled exchange rate appreciations and potentially destabilizing asset price booms are ineffective.

countries rather than the reverse and where unchecked capital flows can expose countries to excessive systemic risk (De Long, 2004). Blouin, Ghosal, and Muhan (2011) emphasize that arguments for capital controls are strongest when institutional state capacity is weak and the economic environment is uncertain, putting countries at risk for capital flight.

On the other hand, critics point to evidence that the controls are ineffective: markets figure out ways to circumvent restrictions on the movement of capital, as was the case during Bretton Woods once restrictions on the current account were lifted. Critics also suggest that capital controls encourage corruption, hinder necessary policy adjustment in the time of a crisis, significantly raise trade costs and the cost of capital, and make it difficult to attract capital flows once the crisis period ebbs (e.g. Edwards, 1995, Wei and Zhang, 2007). Moreover, even if implemented in response to balance-of-payments crises, they can become permanent policy features that distort markets (Edwards, 1999).

Empirical research has attempted to quantify the relative benefits and costs of capital controls. For example, Alesina, Grilli and Milesi-Ferretti (1993) find little evidence that, in general, capital controls reduce long-run growth. Edwards and Rigobon (2009) reexamine the effects of restrictions on capital inflows (as in Chile's recent use of taxes on the movements of short-term portfolio investment), and suggest that these types of controls appear to reduce the vulnerability of the nominal exchange rate to external shocks.

What has received less attention from researchers is the analysis of how capital controls imposed in response to financial crises affect recovery. This may be due to empirical hurdles that make credible identification difficult, such as having too few observed cases of countries imposing capital controls in response to a single crisis or the problem of unobserved heterogeneity that arises from pooling observations across different crises. One recent attempt to overcome these challenges is Kaplan and Rodrik (2002), which uses difference-in-difference estimates to show that the one country that imposed capital controls in response to the 1997-8 East Asian Financial Crisis, Malaysia, experienced stronger recovery relative to countries receiving IMF programs.

B. Exchange-Rate Responses to the Great Depression

The global economic calamity of the 1930s ultimately led to the collapse of the interwar gold standard.⁷ Simmons (1997), Wandschneider (2008) and Wolf (2008) suggest that deflationary pressures, banking crises, gold reserves, and the prior experience of hyperinflation were important determinants in predicting when countries exited. As countries considered abandoning their pegged rates under the gold-exchange standard, they were confronted with the open economy macroeconomic policy trilemma (Obstfeld, Shambaugh and Taylor, 2004). That is, whereas gold-standard countries had previously embraced fixed exchange rates and capital mobility in exchange for limited monetary policy sovereignty, abandoning the gold standard presented countries with new choices. They could: stay off gold permanently and float; devalue and re-peg at lower currency values; and/or put capital controls in place to give them some leverage over domestic monetary policy, perhaps with the hope of reflating their economies or injecting liquidity into weak or collapsing banking systems.

Table 1 summarizes when countries suspended operation of the gold standard, when they depreciated or devalued, and when they imposed exchange controls. For our analysis, we follow other researchers (including the League of Nations), and broadly classify countries into three groups: (1) those that abandoned gold and imposed capital controls; (2) those that abandoned gold by floating their currencies; and (3) those that remained on gold after 1934. The last group includes countries commonly classified as the “gold bloc”: Belgium, France, the Netherlands, Poland, and Switzerland. Italy is classified as an exchange control country for the current analysis since it imposed exchange controls in May of 1934 (Dimitrova et. al., 2007). In addition to the gold bloc, the “gold stalwarts” (i.e., group 3) includes Albania, Hong Kong, Lithuania and the Netherlands Indies, all of which abandoned gold in 1935 or later.

The second group, the “floaters,” includes countries in the Sterling bloc and those that abandoned gold without imposing capital controls. Since a primary goal is to understand how capital controls affected recovery from the Depression, we categorize Finland and the United States as floaters, despite both countries brief experience with exchange controls during this period. For Finland, the exchange control period was only three months – October to December 1931 – and it is seen as ineffective in stemming capital flight (Letho-Sinisalo, 1992). Similarly,

⁷ The interwar gold standard was often known as the gold-exchange standard because countries supplemented gold reserves with the foreign currency of other countries pegged to gold.

exchange controls in the US are generally not considered effective as can be seen in the active forward market in US dollar. Since Portugal's capital controls were nominally in place since 1922, and since they were not used to manage a balance-of-payments crisis, we classify this country as a floater.

The group of exchange control countries comprises the largest group in our sample. It largely consists of Central and Eastern European countries, Latin American countries, Japan, and Iran. Bulgaria heavily relied on exchange controls to align itself with Germany after 1931, so we classify it as an exchange control country. In most countries, exchange controls took the form of administrative controls, with the government centralizing exchange dealings, setting official exchange rates, and hindering the transfer of capital abroad by private citizens to stop capital flight and curb speculation. Governments also took control of export proceeds and privately held foreign assets (Ellis, 1941).

C. Why Did Some Countries Initially Impose Capital Controls?

Nurkse (1944) corroborated the findings of the 1938 League of Nations study, suggesting that the principal reason most countries imposed capital controls in the 1930s was to curb the outflow of capital.⁸ Ellis (1941) also states that countries in this period explicitly used exchange controls to protect against capital flight and to defend parities that had become overvalued based on purchasing power parity values or international price comparisons.⁹ Many European countries opted for capital controls when confronted with banking crises in the spring and summer of 1931, falling foreign exchange reserves, and capital flight. Some countries appear to have been concerned that floating rates, without capital controls, would ignite hyperinflations similar to those seen in Continental Europe in the early 1920s. Germany is often cited as the most prominent example of a country that imposed extensive capital controls, creating a complex system of bilateral trade clearing agreements in the late 1930s after their imposition (Child, 1978; Neal, 1979).¹⁰ German capital controls were initially imposed to curb capital outflows and

⁸ Exceptions may have been Hungary, Greece, and Bulgaria, which appear to have implemented capital controls in 1931 to acquire foreign exchange for debt servicing (Nurkse, 1944)

⁹ Quotas and restrictions on imports, used by France and other gold bloc countries, were an alternative means for maintaining overvalued parities (Nurkse, 1944).

¹⁰ The German bilateral clearing agreements, set up by Hjalmar Schacht in 1934, relied on a system of managed accounts and fixed exchange rates to circumvent the need for gold and foreign assets. At its height, they expanded to 25 countries and covered about half of all German foreign trade (Neal, 1979).

maintained in order to keep the official foreign exchange rates for the Reichsmark at the old parity; thereafter, an extensive trade clearing system was created to offset the distortionary price and trade effects of the capital controls. The clearing system was then utilized by the Nazi government in order to secure critical imports in the absence of foreign currency (US Tariff Commission, 1942). And when countries such as Germany and Hungary imposed exchange controls, some nearby trading partners felt pressure to follow suit (Ellis 1941).

Others imposed capital controls at the time of abandoning gold or shortly thereafter, perhaps fearing what a completely unfettered float might do to their currency values or perhaps as an attempt to gain leverage over domestic monetary policy. Primary-product exporting countries in South and Central America imposed controls in response to balance-of-payment pressures and potential sovereign debt defaults (Bratter, 1939). “Gold bloc” countries fought against the tide and tried to remain on the gold standard well into the 1930s. In response, they resorted to the twin approach of exchange controls and trade protection (Eichengreen and Irwin, 2010).

To assess whether capital controls had an effect on halting capital flight, we computed cover ratios for countries imposing capital controls. The cover ratio for each country is calculated as the ratio of central bank gold reserves and foreign currency assets to its domestic liabilities (defined as notes in circulation). Data are from the *Statistisches Handbuch der Weltwirtschaft* (1934, 1936/7). Figure 1 then centers each country’s data based on the month on which it imposed exchange controls. As the figure shows, cover ratios declined dramatically in the 15 months prior to imposing controls, falling from around 70 percent to below 50 percent. In the months following the imposition of capital controls, the ratio then stabilizes and recovers somewhat.

3. Analyzing how Capital Controls Influenced Recovery from the Great Depression

A. Cross-Sectional Evidence

At the time of their imposition, the League of Nations viewed the widespread use of capital controls as troubling. While recognizing that they halted capital outflows, the League became concerned that the long-term costs of maintaining them would outweigh their short-run

benefits, suggesting that they would raise domestic prices and reduce exports (League of Nations, 1938). Foreman-Peck (1983) later estimated that, as of 1934, the currencies of exchange control countries were overvalued by as much as 60% relative to the pound and the dollar. Ellis (1939) suggests that exchange controls discouraged foreign investment by hindering capital repayments. He also claims that exchange control countries had lower output and trade than countries with depreciated currencies, outcomes we empirically test in our paper. On the other hand, Aldcroft and Oliver (1998) suggest that many exchange control countries expanded their trade through clearing agreements and were able to obtain higher prices for their exports in the clearing markets than in the world market (in effect, diverting trade).

Previous research has established that going off gold was linked to faster economic recovery (Eichengreen and Sachs, 1985 and Campa, 1990), but the focus of these studies was largely on identifying the pre- and post-effects of leaving the gold-exchange standard. Comparatively less attention has been paid to the precise way in which countries abandoned their pegs. A few studies use cross-sectional data to suggest that countries, which chose to remain on the gold standard, had lower rates of growth in industrial production between 1929-35, but that this slow growth was mitigated by the use of exchange controls (Eichengreen, 1992 and Obstfeld and Taylor, 1998). These same studies suggest that countries preserving fixed exchange rates were exposed to greater deflation, but find that deflation was less if they implemented exchange controls; however, they do not try to account for differences in the timing of the implementation of capital controls and how this might influence recovery.

We begin our analysis of the effects on recovery from the Depression by discussing our data and presenting some summary evidence on macroeconomic performance once countries abandoned gold. To do so, we collected monthly data from 1925-36 on industrial production, wholesale prices, and exports for a sample of 50 countries from the League of Nations (1937; 1938) and the *Statistical Handbook of the World Economy* (*Statistisches Handbuch der Weltwirtschaft*). Our database improves on existing interwar datasets by expanding coverage for the number of countries (Latin America and Asia, plus Europe), the number of years (1925 to 1936), and the frequency of data (monthly versus annual). Our sample includes all the major economies on the interwar gold standard as well as almost all other countries that had adopted gold during this period.

Figures 2-4 plot the change in the parity between 1929 and 1936 against industrial production, exports, and wholesale prices. The y-axis values are measured relative to 1929 values, with 1929 indexed at 100. As in Eichengreen and Sachs (1985) and Campa (1990), we find that countries with large post-1929 devaluations experienced stronger growth in all three measures, suggesting a reversal in the trends of the deflation and declining output and exports that had set in during the Great Depression. As shown in Table 1, countries' policy responses to the Great Depression differed. We thus examine the scatter plots for the three sub-groups: exchange control countries, "floaters," and "gold stalwarts" (those that remained on gold past 1934). Figures 5-7 show that the salutary effects documented in the first set of plots were strongest for the floaters. The scatter diagrams suggest that after abandoning gold (and up through 1936), exchange control countries experienced only a slight recovery in industrial production, wholesale prices, and exports.

To shed more light on the effects on the longer-run effects of capital controls, we present results from cross sectional regressions. In particular, we regress one of our macroeconomic outcome variables (industrial production, wholesale prices, or exports) on a constant, a dummy variable for exchange controls, a dummy variable for countries that remained on gold past 1934, and a normally distributed error term. Our sample period ends in 1936, which relative to previous studies, allows us to include more gold bloc countries in our analysis of post-gold standard period; however, the coding of policy regime is nearly equivalent to Obstfeld and Taylor (1998). Hence, we are able to replicate their analysis when restricting the sample period to end in 1935.

Columns 1-3 of Table 2 define the dependent variable as the total percentage change between 1929 and 1935 whereas columns 4-6 define it as the total percentage change between 1929 and 1936. For gold stalwarts, our results are similar to those reported in Obstfeld and Taylor (1998). As columns 1-3 show, countries that remained on the gold standard after 1934 experienced an 18 percent cumulative drop in industrial production and a 28 percent fall in prices, reflecting the deflationary pressures of staying on the gold standard in the 1930s. We also document an almost 40% drop in exports in 1935 compared to 1929. The results are similar when we the sample period is extended to 1936 (columns 4-6). By contrast, our results for exchange control countries differ from earlier studies that reported positive effects of exchange

controls on output and wholesale prices reported in Obstfeld and Taylor (1998). Between 1929-1935, we can identify no statistically significant effect of exchange controls on output, wholesale prices, or export performance. If we instead use 1936 as last year of the sample period, exchange controls appear to moderate the decline in exports; however, we find no statistically significant difference, relative to floaters, for aggregate changes in industrial production and wholesale prices.

B. Difference-in-Differences Estimates

As found in previous studies, summary statistics confirm that abandoning gold accelerated economic recovery in the 1930s. In contrast, however, simple cross-sectional regressions using our higher frequency and larger sample data set show somewhat different effects for exchange control countries. To explore these results further and develop causal estimates, we exploit the panel nature of our data (i.e., monthly data on a large sample of countries) to construct difference-in-differences estimates of the effects of exchange controls on several macroeconomic outcome variables.

Our identification strategy takes advantage of the variation in the timing of gold standard abandonment and restrictions in the movement of capital to identify an average treatment effect on the treated. Again, Table 1 displays the time-series variation in policy changes across countries. If such differences in timing are not accounted for, it can produce biased estimates of our “treatment” variable. To illustrate this point, consider the more recent 1997-98 East Asian financial crisis. Malaysia was still experiencing severe economic difficulties through the summer of 1998, at a time when neighboring countries were already recovering from the 1997 Asian crisis. Malaysia’s capital controls, however, came into place later than South Korea or Thailand’s IMF assistance. Once this difference in timing of the treatment is accounted for, Malaysia appears to have had a faster recovery with capital controls in comparison to those that received IMF assistance packages (Kaplan and Rodrik, 2002). Similarly for our interwar sample, a bias in the treatment effect would occur if one does not account for the variation in timing of when countries leave the gold standard or impose exchange controls. For example, gold stalwart countries are often found to have slow recoveries despite the fact that they did recover when they finally left gold.

To gain some insight into how differences in implementation might matter, we first plot the average monthly growth rates of industrial production, prices, and exports based on the policy choice after abandoning gold. Figures 8-10 show the before and after effects of leaving gold on these three macroeconomic outcome variables when we explicitly control for the month when each country departed gold. It is important to note that the results are not to be confused with the cross section results of Table 2. The growth effects documented here solely measure the recovery of countries once they have left the gold standard or imposed exchange controls. The graphs still confirm that growth rates increased, deflation ended, and exports rose as countries abandoned the gold standard; however, rates differ significantly by group. Figure 8 shows that growth increased for all three groups when countries abandoned the gold standard or imposed exchange controls, and this effect appears largest for the gold stalwarts. Before leaving gold, floaters showed the largest decline in growth rates. All three groups showed deflation while on gold (compare to Figure 9), but again the effect was largest for the floaters. Gold stalwarts exhibit the strongest upward trend in prices after going off gold. Exchange control countries, in contrast, perform similar to floaters. With respect to exports, growth declines by about 0.5 percentage points for all country groups while on the gold standard. Gold stalwarts exhibit the fastest recovery in exports after finally leaving gold. Exchange control countries again recover slightly slower than floaters.

To explicitly account for variation in the timing of gold standard abandonment and policy choice, we estimate a *time-shifting*, difference-in-differences model of the following form:

$$(1) y_{it} = \alpha_{it} + \beta Event_{it} + \gamma Event_{it} * XControls_i + \sigma Event_{it} * Gold_i + C_i + Month_t + \mu_{it},$$

where y_{it} is one of our three measures of macroeconomic performance (growth in industrial production, the wholesale inflation rate, or export growth). $Event_{it}$ is a time-varying dummy variable that indicates the time off gold for each country. It equals one in all the months following a country's decision to devalue and/or officially suspend the gold standard (thereby leaving gold de jure or de facto) or impose exchange controls. $Xcontrols_i$ is a dummy variable for exchange controls as defined in Table 1a. $Gold_i$ is a dummy variable for the stalwarts: countries that remained on gold through the end of 1934 as defined in Table 1c. C_i are country fixed

effects, which absorb the time-invariant dummies for $Gold_i$ and $Xcontrols_i$. $Month_t$ are time fixed effects, and $u_{i,t}$ is a white-noise error term. We estimate models where the omitted category is the floaters – countries that leave the gold standard before the end of 1934 and do not impose exchange controls thereafter. Our counterfactual estimates thus focus on the effects for two treatment groups, exchange control countries and the stalwarts, relative to floaters. In this specification, β describes the percentage point change (technically, log points) of the effect of leaving the gold standard for the omitted category. γ and σ respectively estimate the effect of going off gold for the exchange control countries and the gold stalwarts relative to the omitted group.

Table 3 presents difference-in-differences regression estimates as specified in equation (1). Standard errors of the estimated coefficients are clustered at the country level. For floaters, going off gold raises the growth rate in industrial production by 1.1%, increases monthly wholesale inflation by 0.7% and stimulates export growth by 1.8%, which is consistent with Figures 8-10. Exchange control countries see a 0.7% smaller boost in industrial production growth in comparison to floaters, but no statistically significant different effect with respect to inflation and exports. Gold stalwarts show a 1.3% significant increase in the monthly wholesale inflation relative to floaters when they finally leave gold, but no statistically significant effect with respect to industrial production or exports.

Alternative specifications, taking into account the various sizes of countries' devaluations as well as macroeconomic controls such as the discount rate yielded similar results, confirming the finding of no additional output effects from exchange controls. Overall, these results confirm the findings of the cross-section analysis – that exchange control countries did not outperform floaters and do not appear different from the gold stalwarts.¹¹

C. Endogeneity of Exchange Controls

To account for the possibility that countries that imposed exchange controls were non-randomly selected into the treatment group, we also estimated instrumental variables regressions.¹² Since decisions about exchange-rate regime choices in the late nineteenth and

¹¹ Results are available from the authors upon request.

¹² To assuage concerns about endogeneity, Bernanke (1995) argues that the endogeneity bias of leaving gold points in the wrong direction, since countries with weaker economic performance would be more inclined to leave. Moreover,

early twentieth centuries were dominated by concerns about price stability, we use the change in a country's price level between 1913-1922 as our instrumental variable. In other words, a country's decision about whether to use the gold standard in its purest form may be related to its past experience with inflation. Countries that experienced hyperinflation may have been especially reluctant to abandon the gold standard in the 1930s. Changes in prices during the period 1913-22 are largely associated with wartime disruptions to markets and the end of wartime price controls and therefore represent a plausibly exogenous shock that tempered later decisions about exchange rates. Moreover, price dynamics under the reconstituted interwar gold standard were fundamentally different from the price movements in the floating period before 1922: there is no direct effect from the 1913-22 price changes on industrial production, wholesale prices, and exports under the gold standard regime. Our instrument has a t statistic of 4.0 in the first stage regression.¹³ Table 4 shows that our main findings are not measurably affected when we address the issue of endogeneity. Allowing for non-random selection amplifies the negative effects of exchange controls relative to floaters for both exports and wholesale prices. That is, prices and exports grow more slowly after the change in policy relative to countries that simply abandoned gold and floated. For industrial production, we see no measured difference. Even if our instrument is imperfect, it does little harm to the main thrust of our findings since the direction of bias is likely positive and accounting for endogeneity would only lead to further attenuation of any reported effects. In conclusion, using different specifications and instrumenting for selection bias, we find that, relative to stalwarts and floaters, capital controls had no positive effect on economic recovery from the financial crisis of the 1930s.

4. Why Were Capital Controls Ineffective at Boosting Recovery?

A. Policy Rate Interdependence

Our difference-in-difference regression estimates suggest that, relative to floaters, countries imposing exchange controls exhibit no statistically significant difference in exports or wholesale prices and show a somewhat smaller recovery in industrial production. These findings

Eichengreen (1992) carefully documents the political factors which surrounded each country's decision to leave gold.

¹³ Country samples are somewhat smaller in the IV regressions due to missing data of incomplete data on the change in prices for the period 1913-22.

are consistent with Ellis' (1939) untested claim that capital controls discouraged foreign investment and that capital control countries showed slower output growth. In the framework of the international macroeconomics policy trilemma, this result might seem surprising since countries imposing capital controls had policy flexibility after abandoning gold, and therefore should have performed at least as well as the floaters. For example, in the presence of capital controls, they could now conduct monetary policy with the aim of injecting liquidity into banking systems, reflatting prices, or stimulating output. Although he does not formally test it, in his study of the interwar gold standard Nurkse (1944, p.169), suggests countries may have kept exchange controls in place to “permit the adoption of monetary expansion at home or to at least avert the need for further deflation.”

To understand why we fail to see faster macroeconomic recovery, we analyze the extent to which exchange-control countries availed themselves to autonomous monetary policymaking after they change their policies by examining interest rate interdependence with key gold standard countries. We examine the monthly movements of bank rates or discount rates before and after capital controls were put in place since this was the policy variable that most central banks targeted during our sample period. We run bivariate regressions, comparing changes in each capital control country's discount rate (i.e., policy variable) to changes in a base country's discount rate (meant to represent a benchmark rate that policymakers in other countries would have followed in order to maintain gold convertibility).

We focus on the behavior of *changes* in discount rates or bank rates since results from Augmented Dickey Fuller (ADF) tests cannot reject the null hypothesis of unit roots or near unit roots in many of the bank rate series.¹⁴ For all countries imposing capital controls for which we have data, we regress (in first differences) the discount rate for the country with capital controls on a constant term, the discount rate in a base country, a dummy variable for when capital controls are imposed, and a white-noise error term. We test whether the dummy variable indicating the presence of capital controls is statistically significant different from zero. The base policy rate in the regression represents either the United States or France, two countries which were at the core of the interwar gold standard and which had accumulated large amounts of gold prior to 1929.

¹⁴ Using ADF tests on the discount rates, we cannot reject the null hypothesis of a unit root in levels for all countries except for Austria and Hungary. We reject the null hypothesis of a unit root for all countries in first differences.

Table 5 displays regression results. The dummy variable for capital controls is never statistically significant different from zero, suggesting no discernable difference in the behavior of interest rate deviations from the base country after exchange controls were implemented.¹⁵ As a robustness check, we expanded the set of base countries to include England and Germany to see if there is any evidence that interest-rate policies were asymmetric. That is, while the U.S. and France were linchpins of the interwar gold standard, for some countries they were not the most important trading partner, and since exchange controls can affect both the financial account and the current account, it may be that some countries monetary policies reflected their principal trading partners. Eichengreen and Irwin (1995) as well as Ritschl and Wolf (2003) document the breakup of the interwar gold standard into trade and currency blocs after its collapse. Many countries in Central and Eastern Europe, for example, had close trade ties to Germany, and after exchange controls were imposed, may have pursued monetary policy differently with respect to Germany in comparison to France or the United States. One of the four base countries shown in Table 5 constitutes the principal trading partner for nearly every country in our sample. When the coefficients on the base country are examined, nearby countries such as Austria, Greece, and Hungary seem to track Germany's monetary policy closely; however, columns 1 and 3 of the table show no evidence of a shift in monetary policy towards either England or France once capital controls are in place. Based on these monetary policy regressions, we conclude that notably different monetary policies were not followed after exchange controls were put in place.

B. Further Evidence on Monetary Policy

Interest rate regressions suggest little change in behavior of discount rates after capital controls were imposed. As has been widely noted by economic historians, the financial crisis of the 1930s manifested itself as twin crises in many countries (Grossman, 1994; Eichengreen, 1992; Grossman and Meissner, 2010). With capital controls in place, however, these countries could now conduct monetary policy with the aim of injecting liquidity into banking systems. Did they do so? Figure 11 presents additional evidence on this question by plotting the average money growth rates (M0) for the three groups in our sample, before and after countries leave gold. Consistent with the policy rate regressions, we see a slower growth in money for capital

¹⁵ Standard errors are Newey-West corrected for serial correlation.

control countries after their departure from gold, suggesting that, even if they had found freedom to inject liquidity, they did not take full advantage of it.¹⁶

As a final test of the conduct of monetary policy after the imposition of capital controls, we looked at whether covered interest parity (CIP) held. In particular, we examined the implied profit opportunities that existed if CIP conditions were not met. Violations of CIP indicate arbitrage opportunities, or in our case, that capital controls could have potentially been used to maintain an interest rate different from the global interest rate. Evidence of such differences could suggest that monetary policy was employed to stimulate the domestic economy. Unfortunately, data on forward exchange for our sample period exist for just seven countries, only two of which (Italy and Germany) imposed capital controls and kept them in place for more than a year; hence, the conclusions this exercise are more limited.¹⁷ However, based on this limited sample, we find little evidence from either the time series plots or structural break tests that the behavior of implied profits from interest rate arbitrage for capital control countries were any larger or persisted longer in comparison to, for example, other gold bloc countries that did not impose them and instead devalued.¹⁸

C. Why did Countries Maintain Capital Controls?

As noted, primary sources from the interwar period suggests that policymakers initially imposed capital controls to stop capital flight; however, once the outflows abated, why did countries keep the controls in place? Indeed, many policymakers at the time were opposed to their maintenance. For example, the Bank for International Settlements which, even in its infancy attempted to coordinate central bank activity, thought the maintenance of capital controls stood in the way of reconstituting the gold standard; the BIS thus viewed exchange controls as partly responsible for delaying recovery from the Depression (BIS, *Annual Report*, 1935, 1936).

One reason we examine the somewhat longer-term effects of capital controls is that they may have afforded additional room for maneuver given the constraints of the policy trilemma. Our econometric evidence (albeit ex post) suggests capital controls had little effect on economic

¹⁶ To be clear, similar Figures 8-10, the “off gold” period for the stalwart countries only refers to the months in 1935 and 1936, in which these countries had also abandoned the gold standard.

¹⁷ The five others are Belgium, Holland, France, Switzerland, and the U.S. Data are forward exchange are from Einzig (1934) and interest rate data from Obstfeld, Shambaugh, and Taylor (2004).

¹⁸ Results are available upon request.

recovery in the 1930s relative to other policy options. Further, our examination of short-term interest rates seems to indicate that central banks did not substantially deviate from gold-standard policy paths in order to reflate their economies and expand output.

The historical record points to several other reasons why exchange controls may have been maintained. First, although the initial focus was on capital controls and pressure on the financial/capital account, their persistence can likely be attributed to concerns over the current account (likely reflecting exchange rates that were still managed and overvalued). As global trade collapsed and export earnings fell (due to falling aggregate demand, rising trade barriers, and falling prices), the demand for foreign exchange grew. One way to ensure that foreign exchange needs of governments could be met was to restrict imports via quotas, import restrictions, and import substitution policies (Fishlow 1972, Thorp, 1984). Another way to limit imports, however, was exchange controls. As Eichengreen and Irwin (2010, pp.879) emphasize, “If the exchange controls were comprehensive and effective, they could be administered in a manner that left no need for additional measures such as tariffs or quotas. Import licensing and government allocation of foreign exchange meant that officials could determine the total amount of spending on imports and the allocation of that spending across different goods and country suppliers. Therefore, a country imposing exchange controls might not have to resort to higher tariffs and quotas because it already had the ability to limit imports through administrative action.”

As the decade progressed, it became increasingly clear that exchange controls were working in conjunction with tariffs and quotas to restrict imports. Imports were often forbidden without an exchange permit guaranteeing the distribution of foreign currency to pay for them. “Traders were at liberty to import...but when it came to paying for the goods they often found their exchange applications were met only in part or only after a long delay. This was the origin of the ‘blocked’ commercial balances which many countries, whether or not they practiced exchange control themselves, accumulated in their dealings with exchange-control countries, and these blocked claims led to the use of clearing, funding or other arrangements designed to liquidate them. As a result, there was a marked tendency for exchange and trade controls to be more closely integrated” (Nurkse, 1944, p.175).

In addition, large external debt positions created ongoing demand for foreign exchange. The American stock market boom, however, began to seriously drain liquidity from borrowing regions toward the end of the 1920s.¹⁹ By 1929, after the Federal Reserve increased short-term rates, investors found domestic bonds increasingly attractive. U.S. net short-term and long-term lending turned negative (Eichengreen and Portes, 1990), and net external debtors (including the British Colonies, Eastern and Central Europe, and Latin America) found themselves scrambling to maintain sufficient foreign exchange to pay the interest on their loans abroad. Global commodity prices collapsed at around the same time (Lewis, 1949), compounding the debt servicing problem for many of these primary-product producers and triggering a compression of imports and current expenditures. As the global economic situation deteriorated in the early 1930s, exchange controls became a means for acquiring the currency to service debt. Government officials in Hungary, Greece, and Bulgaria imposed capital controls in 1931 to fend off debt default, and Latin American countries kept capital controls in place after outflows subsided in a futile attempt to avoid defaulting on external debt.

Countries also turned to clearing arrangements to earmark export earnings for debt service. For example, Western European creditor countries that ran bilateral trade surpluses with Germany could use the proceeds out of exports to service German loans via compulsory clearing arrangements (Nurkse, 1944).²⁰ Similarly, England used the stick of the Ottawa Agreements of 1932 (which gave preference to Commonwealth and Empire exports) and the carrot of the 1933 Roca-Runciman Treaty (granting Argentina favored access to these same markets) to secure Argentine payments on its British held foreign debt (Eichengreen and Portes, 1990).

5. Conclusion

The global economic crisis of the 1930s left an indelible mark on the evolution of the world economy. One particularly lasting remnant was restrictions on the movement of capital or “hot money.” (It took until the 1980s for capital flows to regain their importance in the global

¹⁹ The U.S. and U.K. accounted for roughly two-thirds of all gross foreign investment during the interwar period, with much of the U.K. investment channeled to the colonies or dominions (Eichengreen and Portes, 1986).

²⁰ More than a quarter of Europe’s gross foreign obligations (excluding war debts and reparations) was German external debt. It had continued to borrow heavily between the Dawes Loan and when it imposed capital controls in 1931. (Eichengreen and Portes, 1986)

economy.) In this paper, we describe how capital controls first emerged in the 1930s as a response to capital flight during a global financial crisis. They appear to have succeeded in slowing down capital flight. We then document how the controls then persisted, even after gold cover ratios stabilized. Because of policy persistence, we are able to examine whether capital controls affected economic recovery from a financial crisis. Results from time-shifted, difference-in-differences regressions suggest that countries that used capital controls fared worse than floaters and no better than the gold-standard stalwarts – those gold bloc countries that steadfastly maintained gold into the mid-1930s. Capital controls do not appear to have stimulated recovery from the Great Depression.

Capital controls gave central banks additional scope to pursue autonomous monetary policy while maintaining fixed exchange rates. Our results, however, suggest that countries that had imposed them did not fully take advantage of their policy freedom. Interest-rate behavior relative to key gold standard countries shows no sizable change after capital controls are implemented and money supplies do not show faster growth relative to other countries that left gold. These findings are consistent with a large body of research suggests that monetary policies were far too tight in the early 1930s (Eichengreen, 1992; Temin, Friedman and Schwartz, 1962; Temin, 1989) – promoting deflation and, in some cases, contributing to the collapse of banking systems. In contrast, countries that moved to floating rates pursued expansionary monetary policies and appear to have halted further deflation and declining incomes and production.

Capital controls, though potentially useful (especially for small, open economies) for macroeconomic recovery, appear not have been successfully utilized as tools for rescuing banking systems, stimulating domestic output, or for raising prices. Rather they appear to have been maintained as a means for restricting trade (working alongside or in lieu of restrictions on imports) and repayment of foreign debts. While our analysis suggests capital controls provided little macroeconomic benefit relative to other policies that were implemented in the 1930s, it would be difficult to conclude that they would have no ameliorative effects in other crises if employed with that purpose in mind. On the other hand, the experience of the 1930s suggests capital controls are often implemented with very short-run objectives in mind – to prevent capital flight – and macroeconomic objectives can end up sharing the stage with other goals of policymakers.

REFERENCES

- Alesina, Alberto, Vittorio Grilli and Gian Maria Milesi-Ferretti. (1993). "The Political Economy of Capital Controls." NBER Working Paper 4353 (May).
- Bakker, Age F.P. (1996). *The Liberalization of Capital Movements in Europe: the Monetary Committee and financial integration 1958 - 1994*. Dordrecht, Netherlands: Kluwer.
- Bank of International Settlements (1935/36/37). *Annual Report*. Basel, Switzerland.
- Bernanke, Ben S. (1995). "The Macroeconomics of the Great Depression: A Comparative Approach." *Journal of Money Credit and Banking* 27(1): 1-28.
- Blouin, Arthur, Sayantan Ghosalyand, and Sharun W. Mukand. (2011). "Globalization and the (Mis)Governance of Nations." Working Paper, University of Warwick (December).
- Bratter, Herbert M. (1939). *Foreign Exchange Control in Latin America*. New York: Foreign Policy Association.
- Campa, José Manuel (1990). "Exchange Rates and Economic Recovery in the 1930s: An Extension to Latin America," *The Journal of Economic History* 50(3): 677-682.
- Child, Frank (1978). *The Theory and Practice of Exchange Control in Germany* Arno Press: New York.
- 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." *Journal of Money, Credit and Banking*, 12(4): 565-574.
- DeLong, J. Bradford (2004). "Should we still Support Untrammelled Capital Mobility?" *Economists' Voice* B.E. Press 1(1).
- Dimitrova, K., N. Nenovsky and G Pavanelly. (2007). "Exchange Control in Italy and Bulgaria in the Interwar Period: History and Perspectives." Working paper International Centre for Economic Research (April).
- Edwards, Sebastian (1995). "Introduction." In *Capital Controls, Exchange Rates, and Monetary Policy in the World Economy*, (Sebastian Edwards (ed.) Cambridge: Cambridge University Press.
- Edwards, Sebastian (1999). "How Effective are Capital Controls?" *Journal of Economic Perspectives* 13(4): 65-84.
- Edwards, Sebastian and Roberto Rigobon (2009). "Capital Controls in Inflows, Exchange Rate Volatility and External Vulnerability." *Journal of International Economics*, 78(2): 256-267.

- Eichengreen, Barry and Richard Portes (1986). "Debt and default in the 1930s: Causes and Consequences." *European Economic Review* 30(3): 599-640.
- Eichengreen, Barry and Jeffrey Sachs (1985). "Exchange Rates and Economic Recovery in the 1930s." *The Journal of Economic History* 45(4): 925-946.
- Eichengreen, Barry and Richard Portes (1990). "The Interwar Debt Crisis and Its Aftermath." *The World Bank Research Observer* 5(1): 69-94.
- Eichengreen, Barry. (1992). "The Origins and Nature of the Great Slump Revisited." *Economic History Review* 45(2): 213-239.
- Eichengreen, Barry (1992). *Golden Fetters: The Gold Standard and the Great Depression*, New York: Oxford University Press.
- Eichengreen, Barry and Douglas Irwin (1995). "Trade blocs, currency blocs and the reorientation of world trade in the 1930s." *Journal of International Economics* 38: 1-24.
- Eichengreen, Barry and Douglas Irwin (2010). "The Slide to Protectionism in the Great Depression: Who Succumbed and Why?" *Journal of Economic History* 70(4): 871-897.
- Einzig, Paul (1934). *Exchange Control*. London: Macmillan.
- Ellis, Howard S. (1939). "Exchange Control in Austria and Hungary." *The Quarterly Journal of Economics* 54(1): 1-185.
- Ellis, Howard S. (1941). *Exchange Control in Central Europe*, Cambridge: Harvard University Press.
- Ellis, Howard S. (1942). "The Problem of Exchange Systems in the Postwar World." *American Economic Review* Vol. 32, No. 1, Part 2, pp. 195-205.
- Fishlow, Albert (1972). "Origins and Consequences of Import Substitution in Brazil." In L. de Marco, ed., *International Trade and Development*. New York: Academic Press.
- Foreman-Peck, James (1983). *A History of the World Economy: International Economic Relations since 1850*.
- Friedman, Milton and Anna Schwartz. (1963). *A Monetary History of the United States, 1867-1960*. Princeton, NJ: Princeton University Press.
- Glick, Reuven and Andrew K. Rose (1999). "Contagion and Trade: Why Are Currency Crises Regional?" *Journal of International Money and Finance* 18(4): 603-17.

Grossman, Richard. (1994). "The Shoe That Didn't Drop: Explaining Banking Stability During the Great Depression." *Journal of Economic History* 54(3): 654-82.

Grossman, Richard and Christopher Meissner. (2010). "International Aspects of the Great Depression and the Crisis of 2007: Similarities, Differences, and Lessons." *Oxford Review of Economic Policy* 26(3): 318-38.

International Monetary Fund. (1998). *World Economic Outlook* Washington: IMF.

International Monetary Fund. (2011). *IMF Survey Magazine: Countries and Regions*, November 3.

Kaplan, Ethan and Dani Rodrik (2002). "Did the Malaysian Capital Controls Work?" In *Preventing Currency Crises in Emerging Markets*, Sebastian. Edwards and Jeffrey Frankel (eds.). Chicago: University of Chicago Press & NBER.

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

Klein, Michael. (2012). "Capital Controls: Gates and Walls," *Brookings Papers on Economic Activity* (forthcoming).

Krugman, Paul. (1998). "Saving Asia: It's Time to get Radical", *Fortune* September 7: 74-80.

League of Nations. (1937). *Monetary Review, Money and Banking 1936/37*, Volume 1, Geneva: League of Nations.

League of Nations. (1938). *Report on Exchange Control*. Geneva: League of Nations.

League of Nations. (various years). *Yearbook.*, Geneva: League of Nations.

Lehto-Sinisalo, Päivikki. (1992). "The History of Exchange Control in Finland." Bank of Finland Discussion Paper.

Lewis, W. Arthur. (1949). *Economic Survey, 1919-1939*. London: Allen & Unwin.

Neal, Larry. (1979). The Economics and Finance of Bilateral Clearing Agreements: Germany, 1934-1938," *Economic History Review* 32: 391-404.

Nurkse, Ragnar (League of Nations). (1944). *International Currency Experience: International Currency Experience*. Princeton, NJ: Princeton University Press,

Obstfeld, Maurice and Alan M. Taylor. (1998). "The Great Depression as a Watershed: International Capital Mobility over the Long Run." In *The Defining Moment: The Great*

Depression and the American Economy in the Twentieth Century, Michael D. Bordo, Claudia Goldin and Eugene N. White (eds.), Chicago: University of Chicago Press, pp. 353 – 402.

Obstfeld, Maurice, Jay Shambaugh and Alan M. Taylor. (2004). “Monetary Sovereignty, Exchange Rates and Capital Controls: The Trilemma in the Interwar Period,” *IMF Staff Papers* 51 (special issue).

Ostry, Jonathan, Atish Ghosh, Karl Habermeier, Marcos Chamon, Mahvash Qureshi and Dennis Reinhardt. (2010). “Capital Inflows: The Role of Controls” *IMF Staff Position Papers* 10/04.

Ritschl, Albrecht und Nikolaus Wolf. (2003). “Endogeneity of Currency Areas and Trade Blocs: Evidence from the Inter-war Period.” CEPR Discussion Paper 4112.

Statistisches Reichsamt. (1934). *Statistisches Handbuch der Weltwirtschaft*. Berlin: Verlag für Sozialpolitik, Wirtschaft und Statistik Paul Schmidt.

Statistisches Reichsamt. (1936-7). *Statistisches Handbuch der Weltwirtschaft*. Berlin: Verlag für Sozialpolitik, Wirtschaft und Statistik Paul Schmidt.

Simmons, Beth. (1997). *Who Adjusts? Domestic Sources of Foreign Economic Policy During the Interwar Years*. Princeton, NJ: Princeton University Press.

Temin, Peter. (1989). *Lessons from the Great Depression*. Cambridge, MA: MIT Press.

Thorp, Rosemary. (1984). *Latin America in the 1930s*. London: Macmillan.

United States Tariff Commission (1942). *Foreign-Trade and Exchange Controls in Germany*, Report No. 150, Second Series, Washington D.C.

Wandschneider, Kirsten (2008). “The Stability of the Interwar Gold Exchange Standard: Did Politics Matter?” *Journal of Economic History* 68(1): 151-181.

Wei, Shang-Jin & Zhang, Zhiwei (2007). “Collateral Damage: Exchange Controls and International Trade.” *Journal of International Money and Finance* 26(5): 841-63.

Wolf, Nikolaus (2008). “Scylla and Charybdis. Explaining Europe’s Exit from Gold.” *Explorations in Economic History* 45(4): 383-401.

Table 1: Classifications of Exchange Rate Regimes

Panel A: Exchange control countries			
Country	Official Suspension	Exchange Control	Devaluation or depreciation
Argentina	12/29	10/31	11/29
Austria	4/33	10/31	9/31; 4/34
Bolivia	9/31	10/31	3/30
Brazil		5/31	12/29
Bulgaria		1918	
Chile	4/32	7/31	4/32
China		9/34	
Colombia	9/31	9/31	1/32
Costa Rica		1/32	
Cuba**	11/33	6/34-7/34	4/33
Czechoslovakia		10/31	2/34; 10/36
Denmark	9/31	11/31	9/31
Ecuador	2/32	5/32-10/35; 7/36	6/32
El Salvador**	10/31	8/33-10/33	10/31
Estonia	6/33	11/31	6/33
Germany		7/31	
Greece	4/32	9/31	4/32
Hungary		7/31	
Iran		2/30-5/33; 3/36	
Italy		5/34	3/34; 10/36
Japan	12/31	7/32	12/31
Latvia	9/36	10/31	9/36
Nicaragua**	11/31	11/31	1/32
Romania		5/32	7/35
Turkey		2/30	
Uruguay	7/29	9/31	4/29
Venezuela		12/36	9/30
Yugoslavia		10/31	7/32

Table 1: Classifications of Exchange Rate Regimes (continued)

Panel B: Free Currency – Floaters			
Country	Official Suspension	Exchange Control	Devaluation or depreciation
Australia	12/29		3/30
Canada	10/31		9/31
Egypt	9/31		
Finland	10/31	10/31-12/31	10/31
Guatemala**			4/33
India	9/31		9/31
Iraq**			
Irish Free State	9/31		9/31
Mexico	7/31		8/31
New Zealand	9/31		4/30
Norway	9/31		9/31
Peru	5/32		5/32
Philippines**			4/33
Portugal	12/31	10/22	10/31
South Africa	12/32		1/33
Sweden	9/31		9/31
UK	9/31		9/31
US	4/33	3/33-11/34	4/33

Panel C: Countries on Gold after 1934			
Country	Official Suspension	Exchange Control	Devaluation or depreciation
Albania			
Belgium	3/35	3/35-4/35	3/35
France			9/36
Hong-Kong**		11/35	
Lithuania		10/35	
Netherlands	9/36		9/36
Netherlands Indies	9/36		9/36
Poland		4/36	
Switzerland			9/36

Table 1: Classifications of Exchange Rate Regimes (continued)

Panel D: Others			
Country	Official Suspension	Exchange Control	Devaluation or depreciation
Spain*		5/31	
USSR*			4/36

Source: League of Nations (1937), BIS (1936). Data on clearing agreements only extends to 1935.

*USSR and Spain were dropped from the econometric analysis since they were not on the gold standard prior to floating or imposing exchange controls.

** These countries have exchange rate data, but no corresponding monthly observations for industrial production, wholesale prices, and exports. Hence, they are excluded from the econometric analysis.

Table 2: The Effects of Capital Controls on Prices, Exports and Production

Dependent Variable	Cross Section, 1929-1935				Cross Section 1929-1936			
	Constant	Capital Control Dummy	Gold Bloc Dummy	R2	Constant	Capital Control Dummy	Gold Bloc Dummy	R2
Industrial Production	-10.73 (7.63)	9.62 (9.23)	-18.68* (10.79)	0.3	-2.98 (8.17)	10.40 (10.01)	-24.08* (11.56)	0.36
Wholesale Prices	-15.14** (3.10)	-5.31 (4.46)	-28.15** (5.50)	0.45	-14.04** (3.24)	-3.47 (4.43)	-24.33** (5.61)	0.37
Exports	-23.29** (7.93)	-16.58 (10.86)	-38.72** (13.74)	0.19	-14.19 (8.14)	-20.28* (11.53)	-42.19** (14.58)	0.2

Notes: Standard errors are shown in parentheses. * indicates significance at the 10% level and ** indicates significance at 5% level.

Table 3: Difference-in-Differences Estimates of the Effects of Capital Controls on Prices, Exports, and Production

Dependent variable	Constant	Off Gold	Interaction Xcontrol	Interaction Gold	R ²	Observations
Monthly Growth in Industrial Production	0.01508 (0.0132)	0.011227** (0.0045)	-0.006803* (0.0030)	0.001501 (0.0060)	0.14	3343 (25 countries)
Monthly Wholesale Inflation	-0.0054 (0.0039)	0.007299** (0.0019)	-0.001731 (0.0020)	0.01283* (0.0066)	0.20	3778 (37 countries)
Monthly Growth in Exports	0.06436 (0.0353)	0.01778** (0.0051)	-0.00517 (0.0040)	0.00299 (0.0104)	0.16	5124 (36 countries)

Notes: Standard errors are shown in parentheses and are clustered at the country level. * indicates significance at the 10% level and ** indicates significance at the 5% level. All equations include time and country fixed effects.

Table 4. IV Estimates of the Effects of Capital Controls

Dependent variable	Off Gold	Interaction Xcontrol	Interaction Gold	Observations
Monthly Growth in Industrial Production	0.0037 (0.005)	0.0035 (0.0066)	0.01776 (0.0110)	3057 (23 countries)
Monthly Wholesale Inflation	0.0111*** (0.0021)	-0.0048** (0.0023)	0.0268** (0.0111)	3778 (37 countries)
Monthly Growth in Exports	0.0219*** (0.0062)	-0.0196*** (0.0063)	0.03414** (0.01652)	4123 (29 countries)

Table 5: Explaining the Movement of Discount Rates for Capital Control Countries, 1925-1936

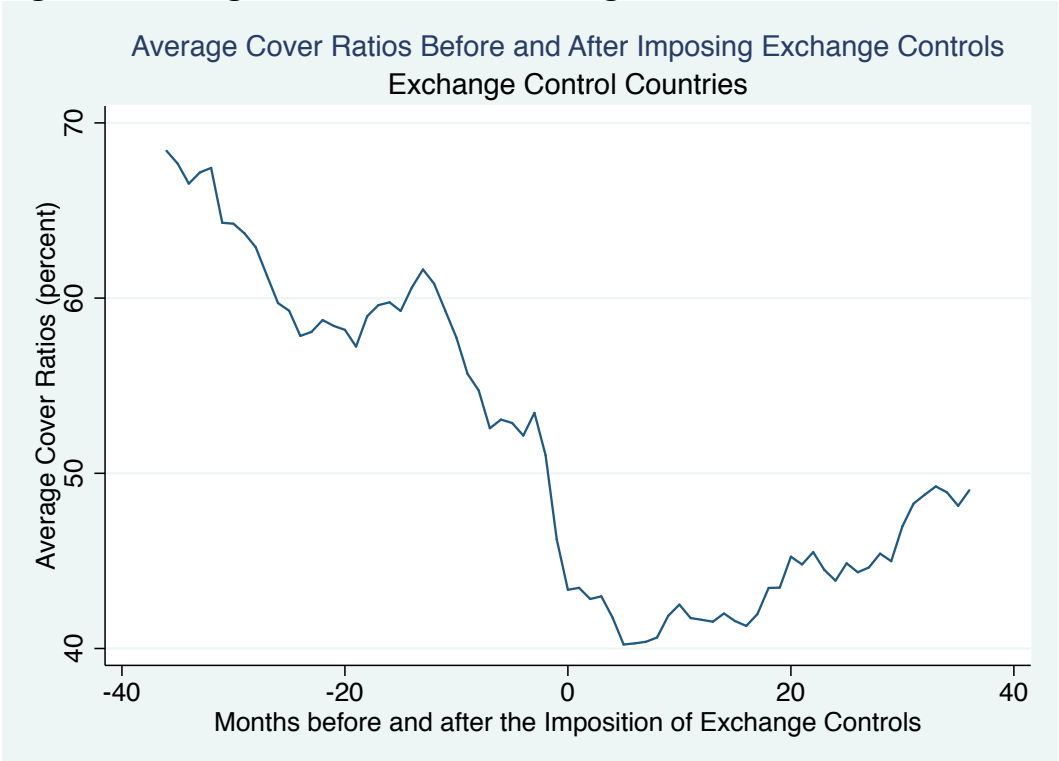
Panel A: Europe					
Country Imposing Capital Controls	Independent Variable	England	United States	France	Germany
Austria	Capital control indicator	-0.021 (-0.30)	-0.066 (-0.86)	-0.069 (-0.89)	-0.044 (-0.67)
	Base country discount rate	0.504* (2.49)	0.015 (0.14)	0.053 (1.92)	0.553*** (3.56)
Czechoslovakia	Capital control indicator	-0.045 (-1.36)	-0.063 (-1.58)	-0.063 (-1.58)	-0.062 (-1.51)
	Base country discount rate	0.190 (1.38)	0.057 (1.08)	0.022 (1.31)	-0.007 (-0.07)
Estonia	Capital control indicator	-0.002 (-0.05)	-0.000 (-0.00)	-0.001 (-0.02)	-0.002 (-0.04)
	Base country discount rate	-0.004 (-0.06)	0.034 (0.94)	-0.016 (-0.83)	-0.006 (-0.14)
Germany	Capital control indicator	-0.011 (-0.14)	-0.008 (-0.10)	-0.006 (-0.07)	
	Base country discount rate	0.353 (1.00)	0.090 (1.34)	-0.008 (-0.50)	
Greece	Capital control indicator	-0.038 (-0.50)	-0.048 (-0.68)	-0.051 (-0.72)	-0.077 (-1.29)
	Base country discount rate	0.268 (1.05)	-0.092 (-0.71)	0.019 (0.67)	-0.281 (-1.52)
Hungary	Capital control indicator	0.024 (0.35)	0.026 (0.37)	0.026 (0.37)	0.029 (0.49)
	Base country discount rate	0.207 (0.83)	0.011 (0.12)	0.007 (0.69)	0.445*** (4.55)
Italy	Capital control indicator	0.064 (1.10)	0.069 (1.16)	0.069 (1.18)	0.072 (1.25)
	Base country discount rate	0.312* (2.34)	0.054 (1.49)	-0.014 (-0.94)	-0.052 (-0.53)
Latvia	Capital control indicator	0.009 (0.43)	0.009 (0.44)	0.009 (0.44)	0.010 (0.48)
	Base country discount rate	-0.001 (-0.12)	-0.003 (-0.44)	-0.002 (-0.73)	0.028 (0.91)
Romania	Capital control indicator	-0.056 (-1.02)	-0.054 (-0.99)	-0.056 (-1.03)	-0.058 (-1.06)
	Base country discount rate	0.098 (1.20)	0.090 (1.42)	0.001 (0.08)	0.040 (1.15)
<i>Number of Observations</i>		143	143	143	143

Table 5: Explaining the Movement of Discount Rates for Capital Control Countries, 1925-1936 (continued)

Panel B: Latin America and Asia					
Country Imposing Capital Controls	Independent Variable	England	United States	France	Germany
Argentina	Capital control indicator	-0.057 (-1.51)	-0.052 (-1.44)	-0.046 (-1.56)	-0.054 (-1.46)
	Base country discount rate	-0.041 (-1.64)	-0.094 (-1.18)	-0.120 (-1.22)	-0.006 (-1.03)
Chile	Capital control indicator	-0.072 (-1.48)	-0.068 (-1.43)	-0.075 (-1.48)	-0.074 (-1.48)
	Base country discount rate	-0.134 (-1.16)	-0.214 (-1.78)	-0.016 (-0.78)	0.062 (1.07)
Colombia	Capital control indicator	-0.048 (-1.14)	-0.044 (-1.09)	-0.047 (-1.15)	-0.045 (-1.08)
	Base country discount rate	-0.035 (-0.68)	-0.151 (-1.17)	0.009 (0.87)	0.023 (0.62)
Japan	Capital control indicator	-0.020 (-0.64)	-0.017 (-0.55)	-0.021 (-0.65)	-0.020 (-0.64)
	Base country discount rate	0.080 (1.38)	0.133 (1.58)	0.004 (0.43)	-0.005 (-0.20)
<i>Number of Observations</i>		143	143	143	143

Notes: Discount rates and base rates are first differenced. Standard errors are shown in parentheses and are Newey-West corrected. Statistical significance at the 10 percent, 5 percent, and 1 percent levels are shown with *, **, ***.

Figure 1: Average Cover Ratios for Exchange Control Countries



Note: The cover ratio is calculated as the ratio of bank gold reserves and foreign assets to domestic liabilities. Source: Statistisches Handbuch der Weltwirtschaft (1934, 1936/7).

Figure 2: Exchange Rates and Industrial Production, 1929-36 (1929=100)

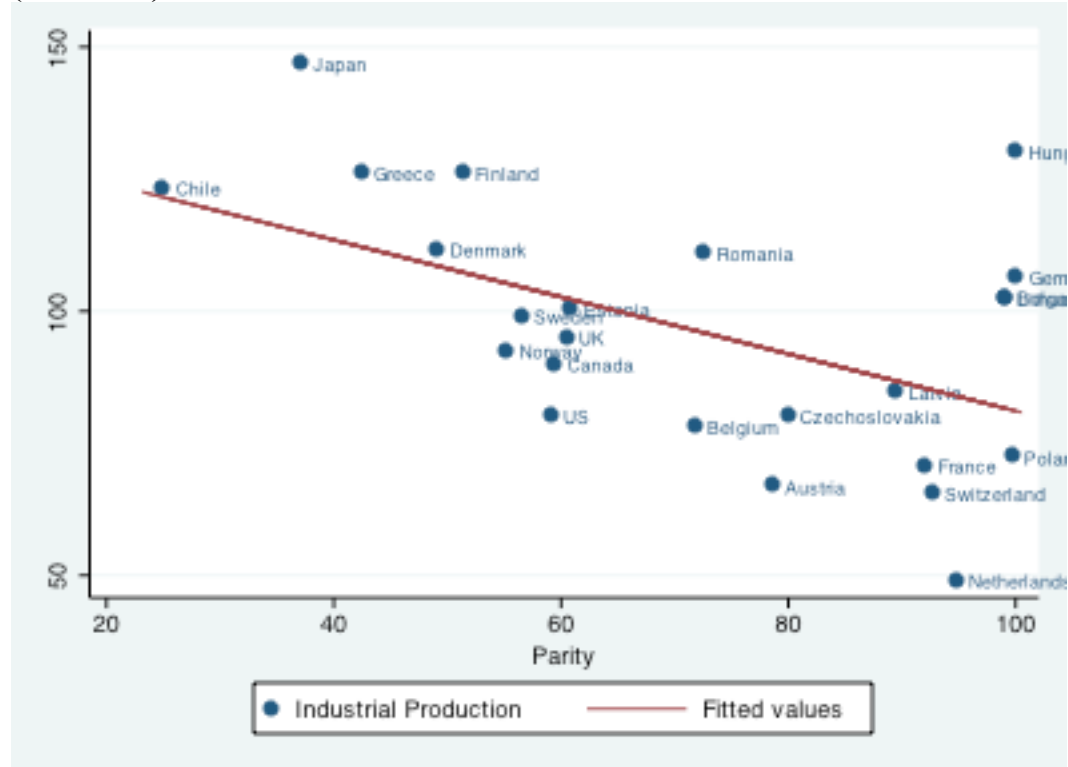


Figure 3: Exchange Rates and Wholesale Prices, 1929-36 (1929=100)

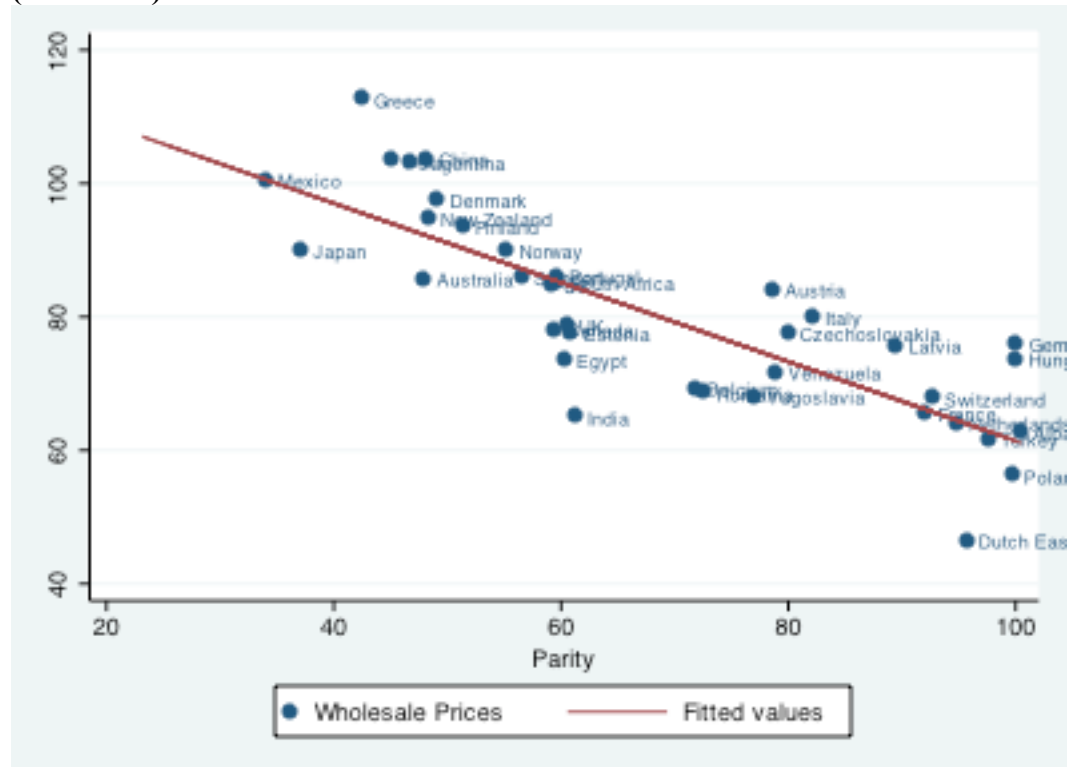


Figure 4: Exchange Rates and Exports, 1929-36 (1929=100)

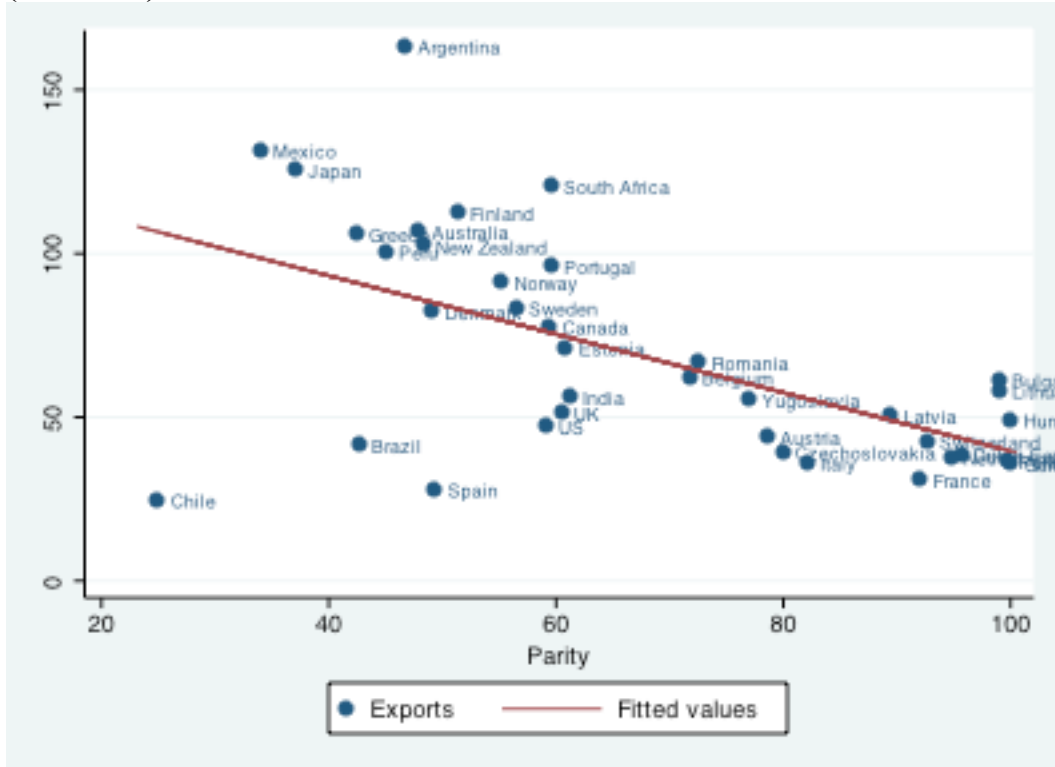


Figure 5: Industrial Production and Exchange Rates by Group, 1929-36 (1929=100)

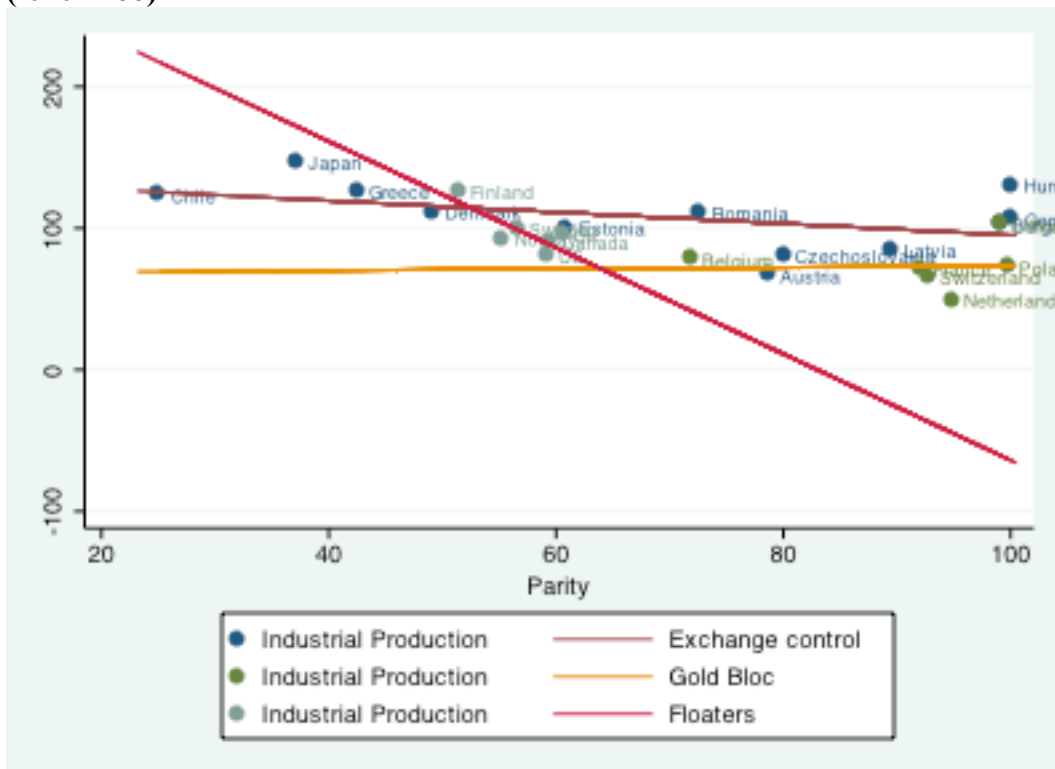


Figure 6: Wholesale Prices and Exchange Rates by Group, 1929-36 (1929=100)

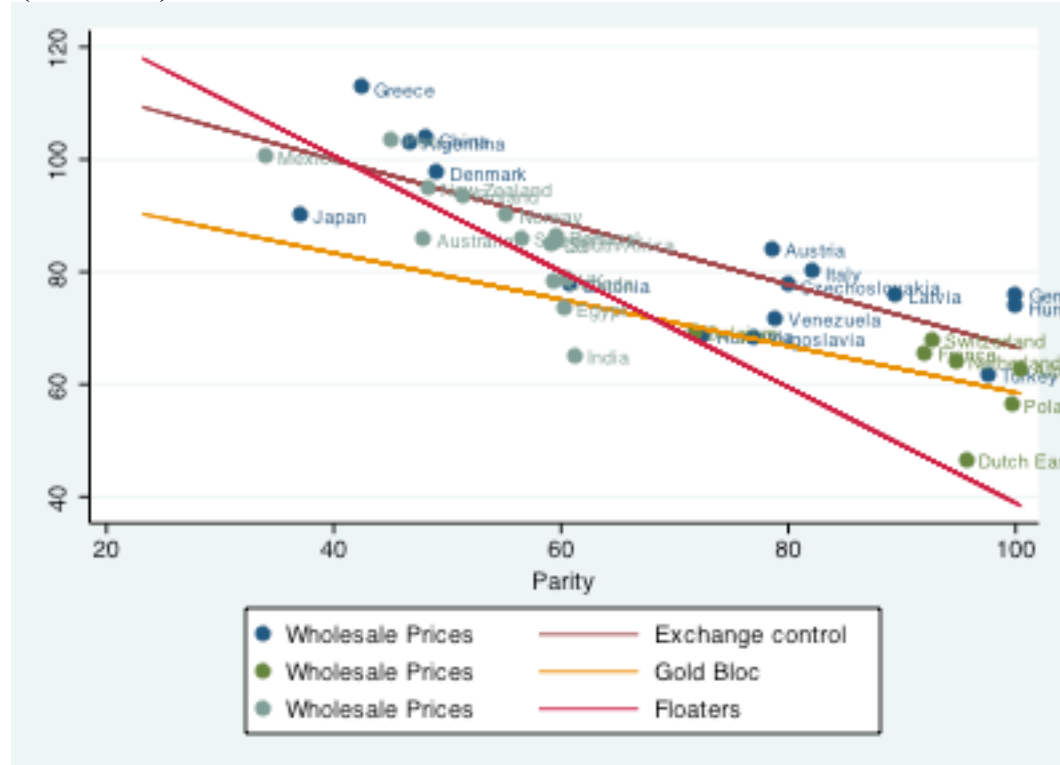


Figure 7: Exports and Exchange Rates by Group, 1929-36 (1929=100)

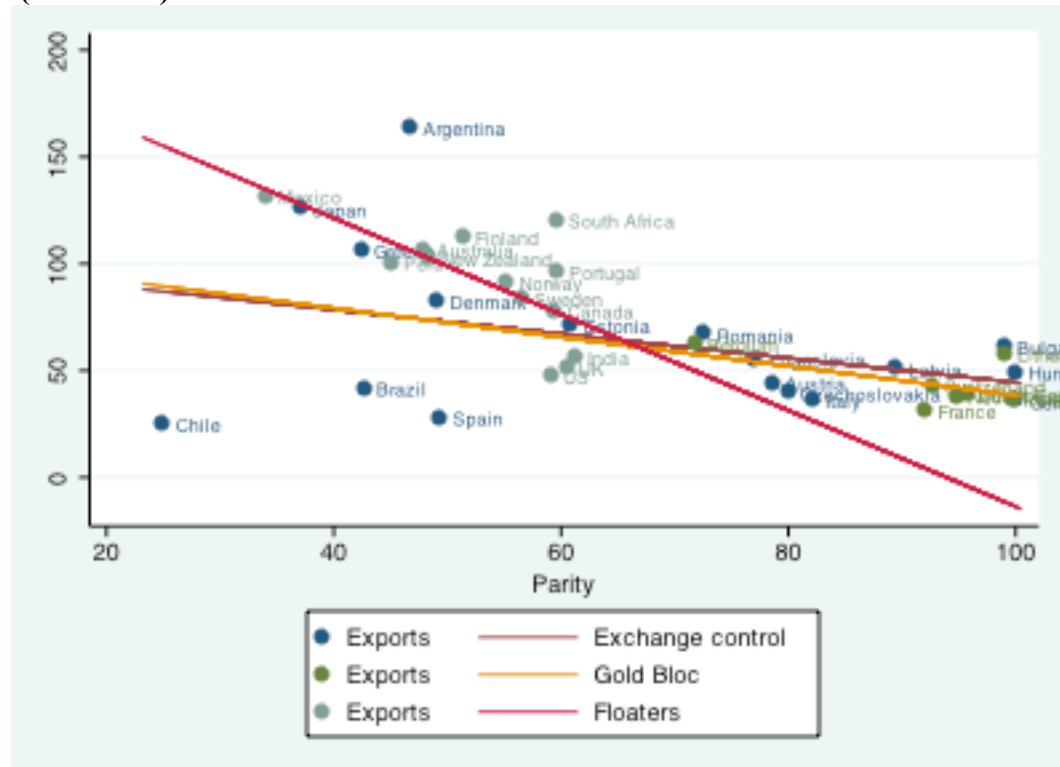


Figure 8: Average Growth in Industrial Production by Regime and Group

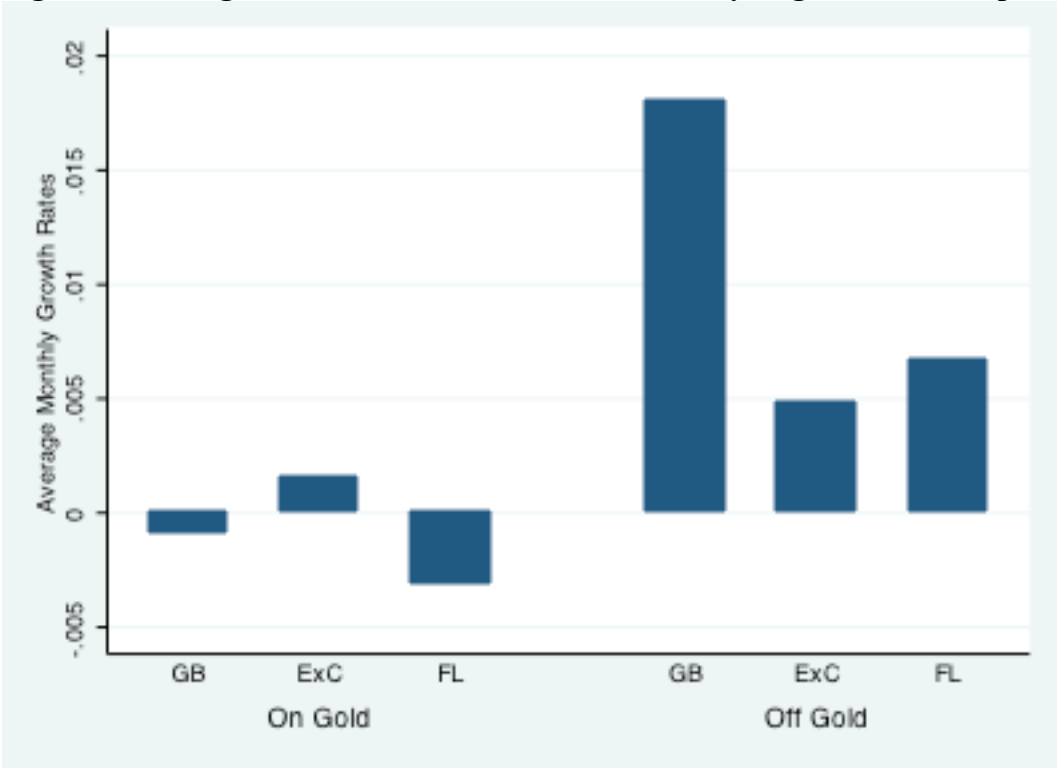


Figure 9: Average Inflation Rates by Regime and Group

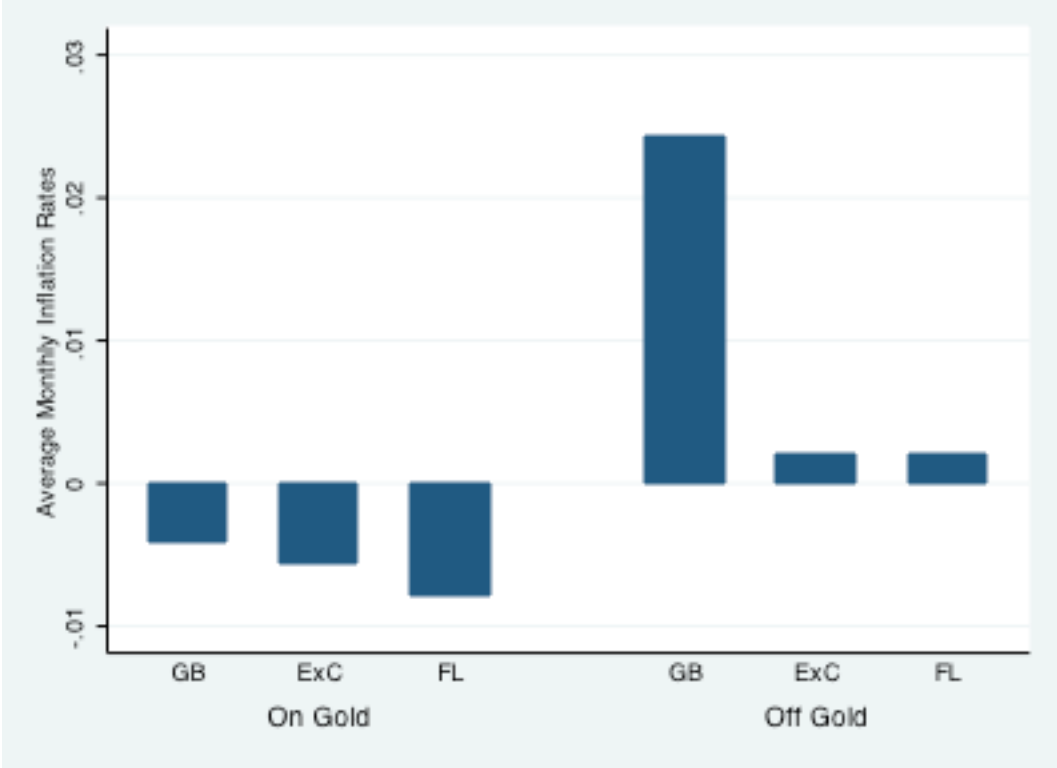


Figure 10: Average Export Growth Rates by Regime and Group

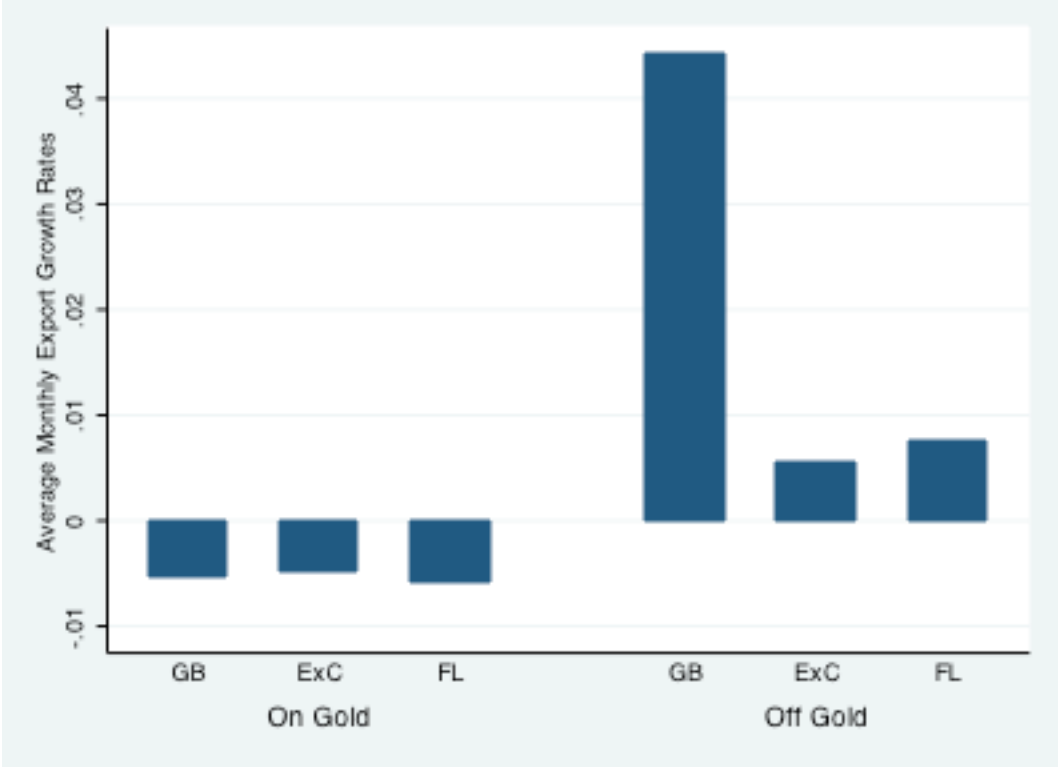


Figure 11: Average Money Growth Rates by Regime and Group

