The Political Consequences of U.S. Currency Swap Arrangements

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Abstract

During global economic shocks, governments seek international financial and monetary cooperation. We argue that such cooperation can shape public evaluation of incumbents, even if the public is not aware of the policies behind government response. Focusing on central banks' cooperation during a global crisis, we argue that currency swap arrangements (CSAs) with the Federal Reserve alleviate anti-incumbent sentiment in a recipient country. CSAs help recipient governments defend their exchange rate and adopt expansionary monetary policies during global economic shocks. Consequently, CSA recipients are less likely to suffer from anti-incumbent sentiments despite global crisis. We test our theoretical priors by analyzing quarterly data for CSA recipients and non-recipients for 2004-2018. Accounting for selection bias in CSA receipts, we find robust and strong evidence in support of these claims. While non-recipients lost an 8% of government approval during a global crisis, CSA recipients enjoyed a 3.4% *increase* in government popularity. Our findings show that international monetary cooperation can generate substantial political spillovers.

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1 Introduction

A large body of literature studies the impact of economic shocks on the public's evaluation of incumbent governments.[1] One consensus in the literature is that currency crisis, or currency depreciation, generates anti-incumbent sentiments. Examples abound where a country's currency depreciation leads to political upheavals and public anger. The depreciation of the Indonesian Rupiah by more than 400% during the 1997-1998 Asian Financial Crisis led to mass demonstrations against the government and ultimately contributed to the collapse of the 30-years of Suharto's dictatorship. The loss in the value of the British pound vis-à-vis the US dollar upon the 2016 Brexit referendum, was found to strongly correlate with decreasing government approvals for the subsequent four years until the outbreak of Covid-19. Anecdotal evidence as such is supported extensively in the existing literature. Studies consistently find that currency depreciation reduces government popularity and leaders' likelihood of survival in office because currency depreciation is associated with reduced purchasing power, lower real wages, and worsening job prospects. (Frankel 2005; Walter 2009; Quinn and Weymouth 2019; Ahlquist, Copelovitch, and Walter 2020; Steinberg 2021).

In this sense, global financial crisis is of great concern for governments. During lobal financial crisis, investors chase after safe assets such as US dollars and gold. Unfortunately for non-US governments, the increasing demand for safe assets inevitably creates depreciation pressure in industrialized and emerging market economies alike (Fratzscher 2009), which is likely to reduce public satisfaction with the government. Against the backdrop of global financial crisis, governments often turn to international financial and monetary cooperation. We argue that such cooperation can shape public evaluation of incumbents, even if the public is not aware of or does not understand the policies behind government response. In particular, we examine central banks' monetary

1. See Healy and Malhotra (2013) and Anderson (2007) for reviews of the studies on economic voting behavior during economic shocks.

cooperation in the form of currency swap arrangements (CSAs) during global financial crisis. In the last two decades, the Federal Reserve (Fed) and central banks have undertaken coordinated efforts to provide dollar liquidity through CSAs when the global economy faces dollar shortages. As such, CSAs have "become the key structural and competitive features of global financial markets" (Baker 2013). The Fed has utilized CSAs extensively to bolster global banks during major global crises including the Global Financial Crisis in 2007-2009, the Eurozone Crisis in 2010, and again the Covid-19 pandemic in 2020.

As CSAs have been widely utilized, a growing literature in economics have examined the effectiveness of the policy tool. In addition to meeting the initial policy objective of mitigating dollar shortages, however, what is being consistently found is that an announcement of CSA leads to a partner currency's appreciation against US dollars (Baba and Packer 2009; Aizenman and Pasricha 2010; Aizenman, Ito, and Pasricha 2021). The immediate injection of US dollars into an economy boosts investors' confidence about the economy and lifts the currency value against the US dollar. For example, Baba and Packer (2009) find that the Fed's CSAs with the European Central Bank and Swiss National Bank during the Global Financial Crisis substantially diminished the foreign exchange dislocation in European currencies vis-à-vis the US dollar. Aizenman and Pasricha (2010) find similar effects for emerging market economies, reporting that "the announcement of CSAs had relatively large, short-run impacts on the exchange rates of the recipient emerging market economies". Aizenman, Ito and Pasricha (2021) examines the consequences of CSAs during the 2020 global pandemic and once again find that CSA announcements lead to appreciation of the recipient currencies against the US dollar. The impact is immediate: "The cumulative appreciation is significant after day 2 [of the announcement], and reaches 2 percent by day 5" (p.13). The authors state that "the announcements of the Fed liquidity facilities [CSAs] did mitigate the dollar shortage through the confidence channel" as the impact was materialized even before the central

bank actually disbursed the US dollars into its economy (p.13). In short, the announcement of CSAs with the Fed immediately affects investors' risk perception of the recipient economy and leads to the recipient currency's appreciation. The findings seem to hold across developed and emerging economies alike and across different global crises.

We combine the currency literature and the CSA literature to argue that the Fed CSAs generate not only economic but also substantial political consequences. During global crises when virtually all currencies except the US dollar are under depreciation pressure, governments around the world suffer anti-incumbent sentiments. However, a CSA announcement with the Fed leads to currency appreciation vis-à-vis the US dollar. We propose that such a rise in currency values should, then, lead to a rise in government approvals because it is associated with recovered purchasing power, real wage rates, and job prospects. Furthermore, the recipient governments find room to implement expansionary monetary policies that help counter global crisis when their currencies are defended in a reasonable range. Consequently, CSA recipients experience a rebound in government approvals upon CSA announcements, whereas non-CSA recipients continue to suffer from anti-incumbent sentiments during a global crisis.

We test our argument by analyzing quarterly data on government popularity for 40 countries for the period between 2004 and 2018. The time frame includes both the 2008 Global Financial Crisis and 2010 European Debt Crisis, during which the Fed activated CSAs with a wide range of foreign central banks. We take into account the selection bias in CSA receipts through two-stage models with instrument variables. As a robustness check, we also conduct synthetic control analysis to construct the closest 'control group' to assess the effect of CSAs. Across different models and analyses, we find consistent evidence in support of our claims. CSA recipients, on average, did not suffer anti-incumbent sentiments despite global crises. While non-recipients lost about 8% of government approval during a global crisis, CSA recipients enjoyed a 3.4% *increase* in government popularity. We find that the popularity-boost effect from CSAs lasted as

long as the global economy faced the dollar shortage. During the period, the difference in government popularity between CSA recipients and non-recipients was as large as 12%. This difference is larger (up to 14%) among emerging market economies. These findings indicate that even highly technical international cooperation such as cooperation among central banks can generate substantial domestic spillover effects.

This study advances our understanding of the international monetary relations. First, our findings speak to the studies that link public opinion and international financial and monetary cooperation. Previous studies have examined how the mass public reacts to financial shocks and salient cooperation such as IMF programs. Adding to this literature, this study highlights that even the financial and monetary cooperation that goes mostly unnoticed by the public could have immediate effect on public opinion. Through its effect on the economy, CSAs can shape public evaluation of incumbents, even if the public is not aware of the policies behind the government response.

Second, this study contributes to the growing literature on CSAs. Since the 2008 Global Financial Crisis, CSAs have become an important cooperative policy tool for middle- and high-income countries. During the Covid-19 crisis, for example, the Fed re-established temporary CSAs with central banks in over thirty largest economies including Australia, South Korea, Mexico, Brazil, Denmark, New Zealand, Norway, Singapore, and Sweden to name a few. For those that have permanent CSAs with the Fed, such as central banks in Switzerland, Canada, the United Kingdom, the Eurozone, and Japan, the Fed further cut interest rates to release more dollars during the pandemic. Despite having become the cornerstone of global exigency measures, very little is known about the *political* consequences of CSAs in the existing literature. Previous research on CSAs have predominantly focused on the economic consequences of CSAs and why the Fed provides CSAs.[2] The few studies that examine the political implications of CSAs focus

2. Broz 2015; Sahasrabuddhe 2019; McDowell 2012; Aizenman and Pasricha 2010; Rose and Spiegel 2012; Broz and Zhang 2018; Aizenman, Ito, and Pasricha 2021; Perks, Rao, and Tokuoka 2021; Bahaj and Reis 2018

on the creditor countries, i.e. the U.S. and China.[3] Our study provides initial evidence that CSAs yield political consequences in recipient countries.

Relatedly, our findings echo the emerging awareness among policymakers and scholars that "central bankers can no longer pretend that they are apolitical independent institutions [because] they wield a tool that can make or destroy the social fabric".[4] Our findings provide concrete evidence that central banks, through CSAs, can contribute to political stability during global shocks. At the same time, we demonstrate that the Fed could affect a *foreign* country's domestic politics. This not only means that the Fed can mediate the political consequences of global shocks, but also that the Fed can be another tool for the U.S. to favorably treat her allies. Therefore, although being primarily determined by technocrats, CSAs have much more potential to be politicized than commonly assumed. While the Fed is not the only provider of CSAs, this paper focuses exclusively on Fed's CSAs because only the Fed CSAs can make a substantial impact on a recipient currency's exchange rate against the international reserve currency.[5]

2 Currency Swap Arrangement: What is it? How does it work? Who gets it?

Probably, the most well-known cooperative measure to overcome a financial crisis among

3. Chey 2012; McDowell 2012; Broz 2015; Liao and McDowell 2015; McDowell 2019b

4. Statement by Andrew Sheng, a former deputy chief executive at Hong Kong Monetary Authority, in April 2020 at East Asian Forum. Emphasizing the important role of currency swap arrangements during global crisis, Sheng argues for more discussion on political and social implications of central bank cooperation: 'it is time to have a serious conversation about the post-pandemic social contract that must include the role of central banks.' Available at: https://www.eastasiaforum.org/2020/05/04/cooperation-needed-to-reduce-the-costs-of-unprecedented-central-bank-actions/. See also (Broz 2015) for scholarly attention on the role of the Fed.

5. Many leading countries in addition to the U.S., arrange CSAs. China is notably the second most active provider of currency swaps. Chinese CSAs are, however, different from that of the US Fed in the sense that China uses swap lines as a tool of financial statecraft (Armijo and Katada 2015; McDowell 2019b) rather than a solution to liquidity problems. Not surprisingly, there is no evidence that Chinese CSAs affect a recipient's exchange rates against the US dollar. With the unique dominance of the US dollar in the international financial markets, we believe the Fed's CSAs have the strongest stabilization impact on a recipient's currency during global crises.

governments is International Monetary Fund (IMF) program. However, IMF loans often being too slow and too small, the US government has devised alternative measures, including unilateral bailouts and currency swap arrangements (CSAs) (McDowell 2019a). With deepening interdependence in global financial systems and as more banks and firms accumulated external loans from US banks globally, the Fed has developed an interest in extending its role as the lender of last resort beyond national borders. By providing dollar liquidity to foreign central banks through CSAs when dollars are short, the Fed is able to prevent foreign banks from defaults and liquidity crises, and avoid sharp dollar appreciation (McDowell 2012, 2019a; Sahasrabuddhe 2019; Destais 2016). At the same time, recipient countries benefit from Fed's CSAs because US dollar shortages can create serious problems ranging from currency devaluation to a loss of investors' confidence and balance-of-payment problems. These features lead some observers to describe CSAs as "one of the most notable examples of central bank cooperation in history" (Obstfeld, Shambaugh, and Taylor 2009; p.483).

CSAs are essentially "contracts or coordinated mechanisms among central banks around the world" (Baker 2013). In dollar swap arrangements, the Fed cooperates with a foreign central bank (e.g. European Central Bank) to "swap" a certain amount of US dollars in exchange for the counterpart's currencies (e.g. Euros). Currencies are swapped at a fixed exchange rate, thereby guaranteeing the recipient bank the access to US dollars when the global economy faces dollar shortages. Assuming that national central banks know better how to best distribute dollars in their domestic economies, the Fed does not participate in the domestic distribution of swapped dollars. When the swap reaches its maturity date, the recipient central bank returns the dollars to the Fed, and the Fed returns the recipient's currency to the recipient central bank. The recipient central bank also pays the Fed the interest earned on the funds lent.

The policy objective of CSAs is "to improve liquidity conditions in dollar funding markets in the United States and abroad by providing foreign central banks with the

capacity to deliver U.S. dollar funding to institutions in their jurisdictions during times of market stress" as the Fed states.[6] Several studies consistently find that swap lines achieve its policy objective (Baba, Packer, and Nagano 2008; Aizenman and Pasricha 2010; Moessner and Allen 2010) Moessner and Allen (2010, p.75), for example, conclude that "the swap lines provided by the Fed were very effective in relieving US dollar liquidity stresses and stresses in foreign exchange markets, so that the Fed's objectives were substantially met."

Given its effectiveness, it is not surprising that CSAs have been extensively used in the last two decades. The Fed initially extended large CSAs to central banks of major industrial countries (European Central Bank, Bank of Japan, Bank of England, and Swiss National Bank) starting in December 2007, then subsequently extended those to nearly every advanced economy in the fall of 2008, and finally, granted similar arrangements to four major emerging market countries (Brazil, Korea, Mexico, and Singapore) on October 29, 2008. At their peak, these emergency credit lines provided nearly $600 billion in financing to economies deprived of dollars. The CSAs all expired in February 2010, only to be re-institutionalized in less than three months due to the global financial instability rooted in the European Debt Crisis. As important economies consistently advocated for a permanent system of central bank swap lines, the Fed eventually transformed some into permanent lines (ECB, Bank of Japan, Bank of England, Bank of Canada, and Swiss National Bank). Upon the arrival of the Covid-19 crisis, the Fed again extended the maturity for all of the permanent lines and reactivated temporary ones.

Although swap lines are a popular feature in contemporary global finance, the selection of CSAs recipients is strategic and selective. To date, the Fed has denied requests from at least seven countries: Chile, the Dominican Republic, Iceland, India, Indonesia, Peru, and Turkey.[7] Studies have found both the economic and political basis for Fed's selection. First, the Fed is more likely to extend swap lines to economies with greater U.S.

6. Fed Official Website, https://www.federalreserve.gov/monetarypolicy/bst*liquidityswaps.htm*
7. Prasad (2014), cited in Sahasrabuddhe (2019)

bank exposure because preventing defaults of such banks serves the U.S. economic interests (Aizenman and Pasricha 2010; Broz 2015).[8] Countries with global financial centers are also more likely to receive CSAs probably because the benefits of such arrangements - currency and market stabilization - can be maximized (Broz 2015). Second, scholars have found that the U.S.'s political interests also play a key role in swap provision. Chey (2012) argues that the Fed's decisions reflect the U.S.'s need to strengthen its ties with emerging market economies. Sahasrabuddhe (2019) advances this position further and finds that emerging market economies that share the Fed's policy preference for greater capital account openness receive CSAs. These findings suggest that CSAs are the U.S.'s tool of financial statecraft. By being discriminatory in selecting liquidity recipients, the Fed is able to provide preferential treatment to those that serve the U.S. economic and political interests.

On the other hand, studies on CSA recipients are rather scarce. While existing studies provide important insights around the motif and the economic outcome of CSAs, the literature has neglected the potential political consequences of CSAs. Therefore, we have little understanding of the full ramifications of CSAs and how much preferential treatment the U.S. is providing to its 'friends' in the form of CSAs. To be clear, an extensive literature has examined the links between international cooperation and public support for incumbents under two camps. The first camp treats economic cooperation during economic shocks, such as IMF interventions or the European Union's monetary policies, to constrain governments' policy autonomy, which often results in a loss of public support.[9] The perspective that international cooperation is a constraint, however, does not hold for CSAs because CSAs come with no strings attached. In fact, many governments have a strong desire to obtain CSAs, which would not have been the case if CSAs sub-

8. Trade links with the U.S. do not affect the likelihood of swap receipts (Aizenman and Pasricha 2010; Broz 2015).

9. See, for example, Rodrik 1997; Bosco and Verney 2012; Dreher 2004; Smith and Vreeland 2004; Youde 2005; Dreher and Gassebner 2012.

stantially limited government autonomy.[10] The second camp in the literature focuses on how economic voting is attenuated with more economic interdependence and increasing cooperation.[11] As globalization and international institutions broaden the distribution of responsibilities for the states of the economy, politicians can shirk responsibility by signaling that they have little "room to maneuver". This perspective assumes that the public is aware of external interventions, which provides limited explanations on the effect of non-salient and technical cooperation such as CSAs.

This paper aims to complement this research. It theorizes and shows that CSAs increase public support for recipient governments. In doing so, this study clarifies why CSAs are not a constraint, but instead an aid for governments to adopt popular policies during a crisis. It further shows how the traditional approaches can be extended to provide a better understanding on the link between international cooperation and public support for incumbents by examining cooperation by technocrats. We suggest that non-salient and technical cooperation can still shape public opinion toward the governments even if the public is not aware of the policies behind the cooperation.

3 The Dilemma and the Political Consequences of CSAs

In this section, we first describe the dilemma governments face during global economic shocks. As the dilemma involves two politically costly options, governments often experience a loss in public support. Then, we turn to explain how CSAs help resolve the dilemma, ultimately mitigating the anti-incumbent sentiments despite economic shocks.

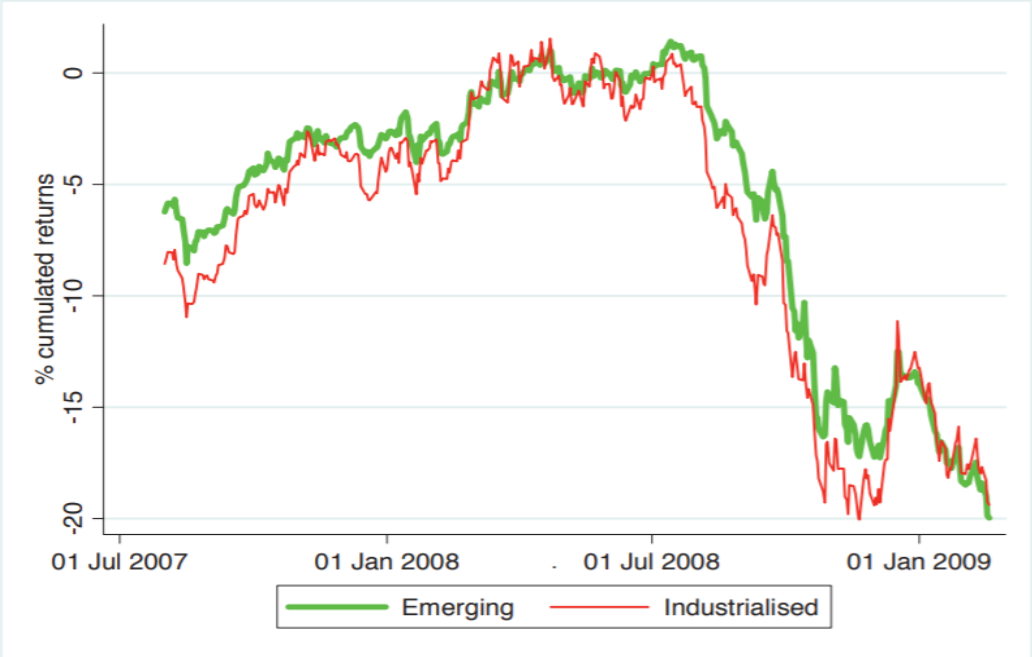
A common trail of events during economic crises is that negative market prospects

10. Central banks in India, Chile, Indonesia, and Colombia, openly expressed disappointment upon the Fed's rejection of their requests and continued in their efforts to establish one. Similarly, right after the Bank of Korea signed a CSA with the Fed in March 2020, the President of Korea publicized the news writing that he "welcomes the news [of CSAs]" and called CSAs the "fruits" of Korean economic policymakers' hard work. Cited in *Financial News*. Translated into English. Available at: https://www.fnnews.com/news/202003201353016393

11. See, for example, Hellwig 2015; Kosmidis 2018; Hobolt, Tilley, and Wittrock 2013; Powell and Whitten 1993

lead investors to chase after safe assets (i.e., gold and US dollars) over high-return assets. The higher demand for US dollars, then, leads to serious exchange market turbulence in countries outside the U.S. For example, Figure 1 shows that the 2008 Global Financial Crisis (GFC) led to a sharp appreciation of US dollars against virtually all currencies. Both emerging market economies and advanced economies, including Japan and the Eurozone, experienced a sudden and stark currency depreciation during the second half of 2008.[12] That global crises and exchange market turbulence go hand in hand was the case for many recent crises such as the 2008 GFC, the 2010 Euro Crisis, and the 2020 Pandemic.[13]

Figure 1: Bilateral US exchange rate movements during the 2008 Global Financial Crisis



Note: the figure shows the average of unweighted bilateral exchange rate movements against the US dollars for 11 industrialized economies and 35 emerging market economies, excluding countries with de-facto fixed exchange rate regime vis-a-vis the US dollar. Source: Fratzscher (2009).

Given the speculative pressure on currency in times of crisis, governments face a dif-

12. The depreciation shock as indeed a widespread phenomenon. Aizenman et al. (2010) find that accumulation of foreign reserves did not prevent the deprecation shock during a crisis.

13. This was true even when the US economy was the origin of the negative shock.

ficult "dilemma". When a currency sharply depreciates, governments need to choose one of the two policy responses: to defend the exchange rate (through internal adjustment) or to let the currency depreciate (external adjustment). The problem is that both adjustments are politically costly. On the one hand, defending the currency requires contractionary monetary and/or fiscal policy adjustments. Borrowing reserves increase public debt, and raising interest rates triggers economic contraction and aggravates the fiscal situation by reducing taxes. The "credit crunch" introduced to defend the currency further reduces investments and jobs, which further reduces public satisfaction with the government. On the other hand, letting the currency devalue is also costly because it leads to purchasing power reduction, more debt burden on foreign currency-denominated liabilities, and potential inflationary effects due to the price increases in imported goods and the authorities' loss of monetary credibility.[14] Not surprisingly, currency depreciation reduces government popularity and leaders' likelihood of surviving in office (Frankel 2005; Walter 2009; Quinn and Weymouth 2019; Steinberg 2021).

In short, during global economic shocks when investors chase after the US dollars, governments outside the U.S. have to wriggle between two unpopular options, which is why many governments delay necessary adjustment (Walter 2013). The dilemma becomes more difficult when the speculative pressure in the exchange market is stronger. This is because when the FX dislocation is large, the necessary adjustment required to correct the FX dislocation increases and the political costs associated with the adjustment inevitably rise. For example, when currency depreciates by 10%, the government may address the FX dislocation by raising the interest rate. However, when currency depreciates by 30%, an increase in interest rate is not likely to be enough to stabilize the foreign exchange market. Instead, the government will have to combine several austerity measures such as raising tax rates as well as interest rates and a drastic decrease in government spending, which all reduce citizens' satisfaction with the government.

14. Devaluation could have benefits in the long run. However, because we are interested in the public's immediate reaction upon a negative economic shock, we focus on the short-run costs.

We argue that CSAs help mitigate the dilemma by counteracting the speculative pressure in the exchange market with the injection of dollars. As a result, governments with CSAs are able to make their internal/external adjustment trade-offs at a narrower range, or avoid the dilemma altogether and focus on expansionary policies to recover from the crisis. In both cases, political costs associated with each policy option are minimized.

To elaborate, CSAs alleviate the FX dislocation because expectations for immediate dollar injection mitigate investors' concerns about dollar shortages and default risks. Firms and banks in recipient economies become capable of paying back their maturing loans using the Fed's dollars acquired via CSAs, and the recipient central banks do not risk running out of their own dollar reserves. As a result, the value of the recipient currency against the US dollar recovers from the 'depreciation shock'. Empirical studies indeed find that exchange rate stability is the key economic consequences of CSAs (Aizenman, Jinjarak, and Park 2010; Aizenman, Ito, and Pasricha 2021).[15] Baba(2009) and Aizenmen et al.(2010) report that CSAs during the 2008 GFC systematically ameliorated the exchange rate dislocations against US dollars. Similarly, examining all of the swap lines during the COVID-19 pandemic, Aizenman, Ito, and Pasricha (2010) find that announcement of CSAs with the Fed lead to significant appreciation of non-US currencies against the US dollar. Our own descriptive evidence also confirms that CSAs stabilize exchange rates: the amount of local currency needed for one US dollar rises until CSA announcement ("Depreciation shock"), but shortly after CSA announcement, the currency quickly recovers from the shock (Appendix Figure 5).

As CSAs ameliorate FX dislocations, governments face a mitigated dilemma. They have to either make a minimal internal adjustment (i.e., a slim increase in interest rate) to correct the small FX dislocation or accept the small FX dislocation (i.e., let the currency depreciate slightly) and do not adopt further contractionary economic policies. Either way, the political cost associated with the adjustment is likely to be smaller than

15. The effect of CSAs on exchange rates is much greater than its effect on other measures of market sentiments such as sovereign bond yields.

what the governments would have to suffer if they had not acquired CSAs. When CSAs boost investors' confidence strong enough such that the FX dislocation becomes negligible, governments can also adopt expansionary monetary and/or fiscal policies to help stimulate economic recovery. Consequently, governments with CSAs are more likely to achieve both exchange rate stability and counter-cyclical policies when they navigate global economic shocks than those without CSAs. In turn, the mass public appreciates the FX stability and stimulus economic policies and shows greater satisfaction with the government. In other words, the political consequences of CSAs are not grounded on the public's awareness of CSAs, but on that CSAs create a positive economic turnaround to which the mass public responds.

Comparing monetary policies and exchange rate fluctuations between CSA recipients and non-recipients makes our point clear. Table 1 compares the annual real interest rates and currency depreciation between countries that received CSAs in Fall 2008 and countries whose requests for CSAs were denied by the Fed.[16] Annual real interest rate is a key monetary policy indicator, while currency depreciation against the US dollar demonstrates the extent to which exchange rate fluctuates. In the last two columns in Table 1, we indicate if the country adopted counter-cyclical policies and stabilized exchange rates during the crisis.

Consistent with our expectations, most CSA recipients were able to overcome the dilemma and achieve both exchange rate stability and expansionary monetary policies during the 2008 GFC. Most of the recipient countries lowered interest rates in 2009 compared to 2008. For example, South Korea lowered interest rates four times in the year of 2008. While it lowered interest rate by 0.25% for the first three times, it was able to reduce it by a whopping 1% in December 2008, once it had obtained the Fed CSA in October. This policy came along with additional government spending and tax cuts in the last quarter of 2008. Similarly, after acquiring CSA in September 2008, the Canadian

16. Exchange rates in 2008 are the rates before a country gets CSA, while the rates in 2009 are the ones a year after CSA announcement.

government announced substantial fiscal stimulus both from the federal and provincial budgets over the 2009-10 period, along with aggressive interest rate cuts. Importantly, these expansionary policies did not put much pressure on currencies. The recipient countries experienced strong currency devaluations before the CSAs in 2008, but all of the recipients except the U.K. managed to stabilize their foreign exchanges by the fall of 2009.

Table 1: Real interest rates and exchange rates between CSA recipients and nonrecipients

		Interest rates (%)			Exchange rate against US dollar			Dilemma resolved?	
		2008	**2009**	**changes**	**2008**	**2009**	**Depreciation**	Expansionary policy?	ER stabilized?
CSA recipients	Australia	4.1	1.0	-3.1	1.1	1.2	5%	✓	✓
	Canada	4.8	2.5	-2.3	1.1	1.1	3%	✓	✓
	UK	1.4	-1.1	-2.5	0.5	0.6	14%	✓	
	Japan	2.8	2.3	-0.5	109.4	94.9	-13%	✓	✓
	Mexico	2.4	3.0	0.6	12.7	13.0	3%		✓
	Brazil	35.4	34.8	-0.6	2.2	1.8	-16%	✓	✓
	S. Korea	4.2	2.0	-2.3	1322.7	1239.7	-6%	✓	✓
	New Zealand	6.2	3.8	-2.3	1.7	1.5	-11%	✓	✓
	Singapore	6.9	2.3	-4.5	1.5	1.4	-2%	✓	✓
Non recipients	Chile	6.0	2.5	-3.5	517.0	547.5	6%	✓	
	Colombia	8.8	8.6	-0.2	1852.4	2019.5	9%	✓	
	India	3.8	4.8	1.0	43.0	48.4	12%		
	Indonesia	-3.9	5.7	9.6	9151.0	9984.1	9%		
	Iceland	7.1	7.4	0.2	81.7	127.0	56%		
	Dom. Republic	8.7	14.1	5.5	34.8	36.1	4%		✓
	Peru	22.3	18.6	-3.7	2.9	3.0	2%	✓	✓
	Turkey	7.575	6.5	-1.1	1.2	1.5	26%	✓	

Sources: World Bank database. Interest rate data for Canada, Chile, and Turkey are from Bank of Canada (2009), Gregorio (2009) and Rawdanowicz (2010) respectively.

Notes: Interest rates represent annual real interest rates. Exchange rates in 2008 note the rates a month before a country received CSA. For S. Korea, Brazil, Singapore, New Zealand, and Mexico, it is the rates in Sep. 2008. For the rest, it is the rates in Aug. 2008. Exchange rate in 2009 are the rates in Sep. 2009. We code expansionary monetary policy being adopted if the government cut interest rates between 2008 and 2009. We code exchange rate being stabilized if the currency experienced equal or less than 5 % of depreciation between 2008 and 2009.

In contrast, CSA non-recipients had to choose between internal adjustment and external adjustment. From the last two columns in Table 1, we see that most non-recipients

achieved only one objective, if any. On the one hand, India, Indonesia, Iceland, and the Dominican Republic prioritized currency stabilization by raising interest rates. But, the reduced supply of credit in the economies costed jobs and investment. All of these four countries had unemployment rates above 5% with India having the highest at 10.7% in 2009. On the other hand, Chile, Colombia, Peru, and Turkey prioritized buoying their economies through expansionary policies, but all of them except Peru paid huge cost as their currencies remained weak for long. These cases confirm that governments without CSAs suffer to a greater extent from the dilemma for which they have to adopt wider ranges of necessary adjustments and pay greater political costs. Note that we are not arguing that CSAs are a panacea for every recipient. Instead, we argue that CSAs, on average, increase the chance of economic stabilization and thereby are more likely to lead to public satisfaction with the incumbents.[17]

Before we put our argument into empirical test, two scope conditions need to be briefly discussed. First, the theory holds only when the public attributes exchange rate stability and monetary policies to the national governments. Countries in the Eurozone, thus, are special cases where the theory has little relevance. The mass public in the Eurozone is well aware that exchange rate policies and monetary policies are not in the hands of their own government but of the ECB. For instance, citizens in the Eurozone believe that the E.U. should "take effective actions against the effects of financial and economic crises" as much as their national government, if not more (European Communities and Commission 2009, 2010, 2011).[18] Thus, the public in the Eurozone countries is less likely to reward or punish their national governments for exchange rate movements or monetary policies (Hobolt, Tilley, and Wittrock 2013; Johns 2011). Second, our argument relies on that the Fed CSAs stabilize foreign exchange markets in a recipient

17. Just like any other policies, however, CSAs may not *always* translate into economic recovery. If CSAs did not successfully stabilize a recipient exchange rate for any idiosyncratic reasons, the CSAs' positive effect on the citizen's satisfaction with the government should be limited.

18. For the question of "which of the following is best able to take effective actions against crisis?" in Eurobarometer survey, the European Union and national government both ranked as the 1st in 2010 with each receiving 25% of respondents' selection.

country. Thus, the premise that US dollar is the dominant international reserve is necessary for our argument to hold. If the dollar loses its status as the international reserve, then the injection of dollars from the Fed would not lead to substantial exchange market stabilization. Despite the changing structure of the global economy, the dollar is still the world's dominant international reserve and is likely to keep the status in the foreseeable future (Copelovitch 2022).

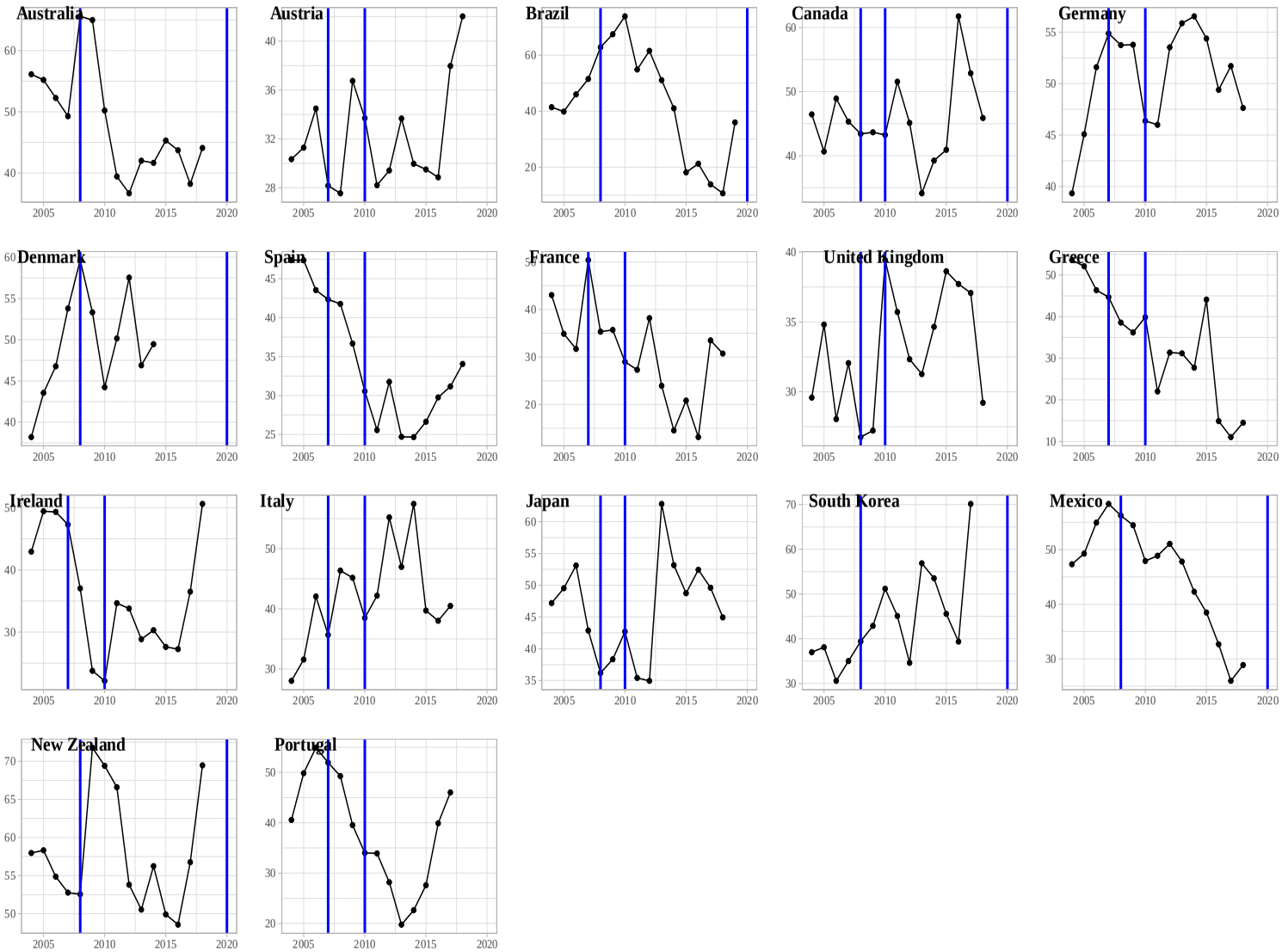
4 Empirical Strategy

4.1 Dependent variable

To measure the public's support for a government, we use the Executive Approval Projects (EAP) which has the most comprehensive quarterly government popularity dataset across countries (Carlin et al. 2019). To construct a reliable and evenly dispersed popularity dataset, Carlin et al. (2019) collect all the available polls for a country and smooth all the data points using Stimson's methods (Stimson 1991). Assuming that different polls may have biases in the opposite directions, i.e. a poll may tend to underestimate or overestimate the real popularity, Stimson methods ease the bias by letting one cancel the other. Data availability of our dependent variable limits our analysis to 40 countries over the period of 2004/Q1 to 2018/Q4. Among all 14 CSAs established by the Fed in the last two decades, our sample includes 9 arrangements, which cover 20 recipient countries.[19] Figure 2 shows the trends for government popularity for CSA recipients in our sample. Two observations stand out in our descriptive plot. First, there is no common time trend in government popularity across countries. Second, Fed CSAs do not appear to be endogenous to a recipient government's popularity.

19. Australia, Austria, Brazil, Canada, Cyprus, Germany, Denmark, Spain, France, U.K, Greece, Ireland, Italy, Japan, South Korea, Lithuania, Latvia, Mexico, New Zealand, and Portugal. We include Eurozone countries in our sample to test if Eurozone is indeed an exception as expected.

Figure 2: Government Popularity by swap Recipient Governments



The blue vertical line indicates the announcement of a Fed CSA.

This is expected given that the Fed does not make individual CSA, but rather announces CSAs to a group of countries all at once.

4.2 Independent variable

We focus on the *announcement* of a new CSA because the effect of currency stabilization from CSAs is the strongest immediately after its announcement and is relatively short-lived (Aizenman, Ito, and Pasricha 2021). Using the Federal Reserve's transaction data for CSAs, we construct a binary variable that has a value of 1 if a country announced a new CSA with the Fed in a given quarter, and 0 otherwise. Table 2 shows all the new CSA announcements made by the Fed between 2004/Q1 and 2018/Q4.[20] We analyze the arrangements written in bold as they have the government popularity data available. The Eurozone countries, Canada, Japan, and U.K. have two new arrangements over this period because their first ones expired in February 2010 and the Fed arranged new lines in May 2010 upon the breakout of the Eurozone crisis.

Table 2: Fed CSA announcements

Date	CSA recipients
12/7/2007	**Eurozone**, Switzerland
9/16/2008	**Canada, U.K., Japan**
9/24/2008	**Australia, Denmark**, Norway, Sweden
10/28/2008	**New Zealand, Mexico, Brazil, Republic of Korea**, Singapore
5/1/2010	**Eurozone, U.K,. Japan, Canada**, Switzerland

While the frequency may deem small in number, this entails liquidity traded for an

20. We do not code the transformation of temporary CSAs into permanent ones in October 2013 because the news went virtually unnoticed among market participants (Destais 2016; p.2259).

average of $3.6 million and a maximum of $11.7 million per announcement. This scale of liquidity is not available in other organizations such as the IMF. For example, the Fed's CSAs peaked at $580 billion during the last quarter of 2008 which is almost four times the total outstanding IMF credit at its peak in 2011 (Destais 2016). Only the Fed, the central bank with unlimited capacity to produce the international currency, can intervene on such a scale. Thus, even a single announcement can be a critical event enough to stir market sentiment.

4.3 Control variables

We control for factors that may confound the relationship between CSAs and government approval rates. First, we control for the global economy by including US 10-year treasury bond yields because global downturn increases the likelihood of CSA activation and possibly impairing government popularity as well. Second, we control for country-specific macroeconomic conditions because underlying economic conditions may affect both the receipt of CSA and government popularity. Using the World Bank data, we control for quarterly unemployment rate, yearly GDP growth rate, and current account balance. We also control for the credit provided by domestic banks because liquidity in the economy may affect public approval of the government and the government's desire to acquire CSA with the Fed. Additionally, because election cycles may affect government popularity and potentially affect the timing of US extension of CSAs, we control for electoral cycles. Finally, we control for the partisanship of the incumbent governments, using the Database of Political Institutions (DPI) Scartascini, Cruz, and Keefer (2017) because both anti-incumbent sentiments during economic shock and the Fed's extension of CSAs may depend on government partisanship.

4.4 Model specification

To best capture the effect of CSAs on government popularity, we address two challenges for valid inferences. First, we need to address potential selection bias in CSA receipts because swap recipients may systematically differ from non-recipients. To adjust for any selection bias, we employ the "control function approach" with instrumental variables (or commonly known as"Heckman two-step model "), which is widely used to correct for selection bias.[21] The control function approach involves estimating (1) the selection equation, and (2) the outcome equation. The selection equation regresses swap arrangements on controls and instruments, using probit models. Based on the estimation, we derive the inverse mills ratio (IMR), also known as the non-selection hazard. Then, we turn to the outcome equation regressing government popularity on the IMR and the same set of controls from the selection equation, excluding the instruments. As the IMR captures the potential selection bias, we essentially control for the bias in the outcome equation by including the IMR as an additional control.

In our selection equation, we utilize existing knowledge about how the Fed determines CSA recipients and include two instrument variables along with all the controls described above: a country's policy alignment with the United States using the UN Security Council (UNSC) voting data (Bailey, Strezhnev, and Voeten 2017) and a country's total debt exposure to US banks. With consistent evidence that the Fed extends swap lines to countries that are strategically important and that share policy preferences with the US government (Broz 2015; Chey 2012; Sahasrabuddhe 2019), we theorize that a country's voting alignment with the US in the UNSC is correlated with swap line arrangements. However, given that the general public knows little about the issues voted at the UNSC, we expect the UNSC voting patterns to not be associated with domestic government approval ratings. Likewise, based on the existing finding that U.S. bank ex-

21. For example, see Stubbs and Kentikelenis (2018) for the discussion of selection bias in IMF program participation.

posure is one of the most important variables that explain CSA receipts, (Aizenman and Pasricha 2010; Broz 2015), we use U.S. bank exposure as another instrumental variable.[22] To serve the U.S. economy, the Fed is more likely to provide CSAs to countries that owe a lot to US banks. U.S. bank exposure also plausibly satisfies the exclusion criteria because it is not widely-circulated information and it is unlikely that the public utilizes the information to evaluate their government.

Another challenge for valid inference lies in the properties of the government popularity data, which are susceptible to unit roots and autocorrelation. Through the most commonly used tests, we find that the series does not have panel unit root.[23] While stationary, the data do exhibit considerable autocorrelation that could bias ordinary least squares coefficient estimates and generate spurious regression (De Boef 2001). Following many studies, we adjust the time dependence by employing Prais-Winsten Regression with robust standard errors (Leblang and Mukherjee 2005; Kayser and Wlezien 2011). Prais-Winsten regression is a form of generalised least squares in which the observations undergo a Cochrane-Orcutt transformation to remove autocorrelation. [24] Combining our earlier discussion on selection bias, therefore, our primary model estimates Prais-Winsten regressions with the IMR (selection bias) as an additional control.

Additionally, we include country and time fixed effects in all our models. The use of country dummies along with Prais-Winsten estimates and robust standard errors, generates very conservative results. However, the use of fixed effects is particularly important for our purposes, as we wish to set aside country-specific legacies that may affect swap receipt and government popularity, such as past experiences with economic shocks and a country's position in the global economy. In addition, although the conservative esti-

22. It is measured by the share of the individual market in the consolidated foreign claims of US banks in each quarter. Source: Bank for International Settlements

23. We conducted unit root tests through Maddala-Wu Unit-Root test, Choi's modified Panel unit root test, KPSS panel unit root test, and Augmented Dickey-fuller test. All of the results suggest that the data in our sample do not have a panel unit root.

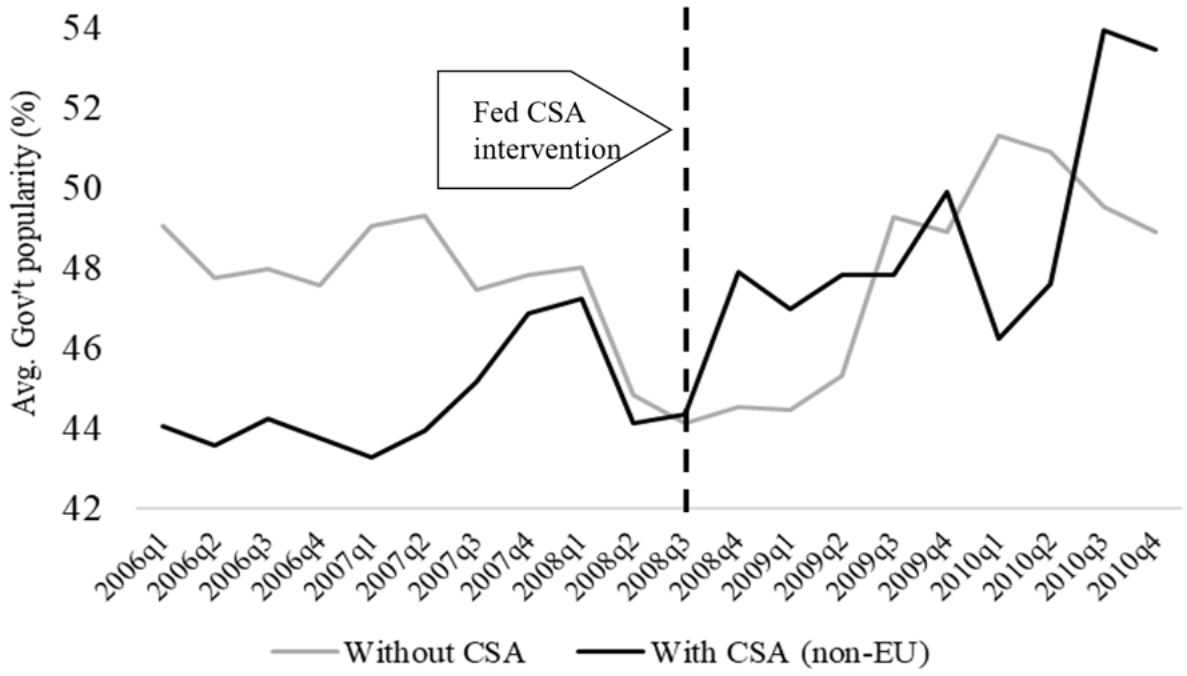
24. We use the Prais-Winsten regression instead of the OLS with a lagged dependent variable because of the concern that the latter could bias the coefficients given high serial-correlation among the covariates (Achen 2000).

mation strategy carries the risk of prematurely abandoning true hypotheses, it increases our confidence for the coefficients that do emerge as statistically significant. Our dataset is a strongly balanced panel. The unit of analysis is a country-year-quarter, which allows us to capture both the sensitivity in government approval rates and the immediate effects of CSAs.

5 Results

First, we probe the plausibility of our argument by simply comparing the average government popularity between CSA recipients and non-recipients before and after the 2008 Global Financial Crisis. If our argument is correct, we should see (i) non-recipient governments' consistent loss of popularity during the negative economic shock, while (ii) CSA recipients' quick recovery from the anti-incumbent sentiments after the CSA announcement. In Figure 3, both predictions hold. Both recipients and non-recipients lose popularity in the first half of 2008 most likely due to the negative shock in the economy. Governments without CSAs do not recover from the popularity loss until late 2009. Governments with CSAs, however, recover popularity soon after the CSA announcement in 2008 Q3.

Figure 3: Average government popularity and CSA announcement



Turning to our statistical analysis, Table 3 presents the results for our Prais-Winsten regressions. Model 1 presents the results with the full set of controls. As expected, we find that the coefficient of CSA announcement is positive and statistically significant with a p-value of 0.012. A CSA announcement is associated with a 3.5% increase in a recipient government's approval rating in the following quarter. It is striking how a highly technical and non-salient policy from the Fed generates systematic impact on the public's perception of their governments in a range of different countries.

Note that our mechanism rests on the economic stabilization effect of the CSA. Specifically, CSA leads to exchange rate stability and expansionary monetary policies, which boost government popularity. In that sense, including variables that are directly affected by exchange rate stability and expansionary monetary policies as controls may introduce post-treatment bias because the post-treatment variables could "soak up" the effect of CSAs, making it difficult to asses the full effect of CSAs. Therefore, in models 2 and 3, we exclude unemployment rate, a variable directly related to monetary policies, and

current account balance, one strongly affected by exchange rates. If our suggested mechanism is correct, we should see a larger and statistically significant coefficient of CSA in these models. The results in models 2 and 3 are exactly in line with our prediction. As variables through which the effect of CSAs translates into government popularity are excluded, the coefficient of CSAs gets larger and achieves stronger statistical significance. In model 4, we pooled all our sample countries to see if Eurozone countries are indeed a special case in which our theory doesn't apply. As expected, in model 4, the coefficient of CSA announcement is positive but smaller and lower in significance.

Coefficients from control variables show expected results. A higher unemployment rate tends to decrease government popularity. The further away a government is from an election, the lower the levels of popularity. Favorable global economic conditions (measured as higher US treasury bond yields) and higher growth rates are associated with higher government approval ratings. In all our models, the transformed Durbin-Watson statistics are above 1.2, a common threshold for the detection of autocorrelation, suggesting that the errors from the models are not serially correlated anymore.[25]

25. Durbin-Watson statistic of 2 indicates an ideal case of no autocorrelation while a value of 0 indicates strong positive autocorrelation.

Table 3: The Effect of CSA Announcements on Government popularity

DV: gov't popularity	(1)	(2)	(3)	(4)
CSA announcement	3.463**	3.501**	3.548***	1.222*
	(1.358)	(1.359)	(1.347)	(0.717)
Unemployment rate	-0.0497			-0.600***
	(0.289)			(0.193)
Current account balance	0.214	0.206		0.168
	(0.135)	(0.131)		(0.112)
Electoral cycle	-0.256***	-0.254***	-0.255***	-0.230***
	(0.0732)	(0.0730)	(0.0732)	(0.0574)
10yr US treasury bond yield	6.470***	6.289***	6.085**	7.918***
	(2.434)	(2.397)	(2.375)	(1.501)
GDP growth rate	0.560***	0.607***	0.579***	0.347***
	(0.181)	(0.180)	(0.183)	(0.124)
Credit by domestic bank	0.0522	0.0513	0.0334	0.0218
	(0.0493)	(0.0491)	(0.0519)	(0.0316)
Right wing government	1.036	0.980	0.934	1.301*
	(1.078)	(1.073)	(1.056)	(0.735)
Selection bias	-2.689	-2.887	-3.150	0.175
	(4.009)	(3.999)	(4.009)	(2.666)
_cons	33.98*	35.47**	37.41**	27.02**
	(17.54)	(17.37)	(17.38)	(11.44)
Durbin-Watson Stat. (Original)	0.4	0.4	0.4	0.4
Durbin-Watson Stat. (Transformed)	1.8	1.8	1.8	1.8
N	1377	1381	1381	1888

Explanatory variables are lagged by one quarter. Country and time fixed effect included.
Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

6 Synthetic control

Our previous panel analyses yield strong support for our argument, using a control function approach to correct for potential selection bias. This approach, however, is sensitive to instrument variables. While we present evidence to suggest that our instrument variables are valid, the validity of instrumental variables is not testable. Thus, in this

section, we conduct synthetic control analysis as an additional strategy to address the potential selection bias. Synthetic control is a widely adopted method in policy studies to evaluate the effect of an intervention by comparing the trajectories of an outcome variable with and without a policy intervention while addressing potential selection bias (Abadie, Diamond, and Hainmueller 2015, 2010; Acemoglu et al. 2016; Bohn, Lofstrom, and Raphael 2014). Synthetic control analysis involves constructing a hypothetical control group through a weighted combination of observed control units. The trajectory of the synthetic recipient then suggests what would have happened to the treatment group if it had not received the treatment. Synthetic control analysis does not require that the donor pool (control units) used in constructing the synthetic control group are a good match *individually* to the treated group. This is particularly useful for our study where it is difficult to find countries that fit closely to all the characteristics that are manifest in CSA recipients.[26]

For the synthetic control analysis, we focus on the CSA announcements made during the Fall of 2008 because that is when many countries received CSAs all at once, and mostly for the first time. Thus, the treatment group is all the CSA recipients that received the CSA in the Fall of 2008.[27] We first generate a representative CSA recipient, by averaging the government popularity of all CSA recipients. Then, we construct a 'synthetic CSA recipient', which is a weighted average of potential control countries, with weights chosen to closely reproduce the values of a set of predictors of government popularity during the 14 quarters prior to CSA intervention in 2008 Q3 (2005 Q1 - 2008 Q3). Our 'synthetic CSA recipient' is the weighted average of Hungary (0.455), Bulgaria (0.303), Argentina (0.102), Turkey (0.082), Iceland (0.052), Chile (0.003) and Colombia (0.002).[28] .

Following the recommendation by Abadie, Diamond, and Hainmueller (2011), our

26. For details on constraints of the data and sensitivity of the SCM, see the appendix.

27. We also test our treatment group for the subset of countries that announced CSA in 2008Q3 to distinguish them from countries that announced CSA in 2008Q4. The results remain substantially the same and robust.

28. We list the control countries, predictor variables, and their weights used to construct the synthetic recipient in Appendix B.3.

predictor variables include our control variables and government popularity values in pre-treatment period.[29] Given these predictor variables, the analysis assigns weights to election cycle (0.102), unemployment (0.001), and government approval rate of pre-treatment years at various weights (Table 5 in Appendix B.3). Our predictor means are well balanced (Table 6 in Appendix B.3).

Finally, synthetic control analysis generates results consistent with our expectations. The top plot of Figure 4 shows the trajectories of government popularity for the treated group (CSA recipients) and the control group (synthetic recipients) for the full study period. Government popularity for the treated group and the control group matches closely during the pre-intervention period, suggesting that the synthetic recipient well represents what would have happened to the recipients if they did not receive CSAs. Importantly, the trajectories of government popularity diverge immediately after 2008/Q3, when CSA was announced for most of the CSA recipients. CSA recipient countries overall enjoy higher levels of government popularity after the CSA announcement. Examining the gap between CSA recipient and the control, we find that CSA recipients enjoy a 9.62% higher popularity in the quarter of CSA announcement and the gap widens as much as 12.19% in 2009/Q2.[30] Note that the gap is driven both by the decline of popularity in the control group and the increase of popularity in the treatment group. It means that CSA recipients would have suffered strong anti-incumbent sentiments during the 2008 GFC, just like other non-recipients, if they had not obtained CSAs. In other words, the absence of anti-incumbent sentiments in CSA recipients during the 2008 GFC is not because they are less vulnerable to economic voting behavior or global shocks, but because they secured CSAs.

Additionally, we find that the popularity-boost effect ends when the global crisis is over. Four quarters after the CSA announcement, the difference between CSA recipients

29. We exclude two of our control variables– US 10-year treasury bond yields and the election dummy variable– that have low variability in the pre-treatment period causing the SCM to degenerate. For full discussion, see appendix.

30. See Appendix B.3.

and synthetic recipients is minimal, and government popularity of the treated and control groups are once again co-moving. This is consistent with our mechanism. The U.S. officially claimed that the GFC was over by the end of summer in 2009.[31] When global shocks and thus dollar shortages dissipate, the gap in government popularity between CSA recipients and non-recipients should disappear because currencies in both groups are no longer under depreciation pressure.

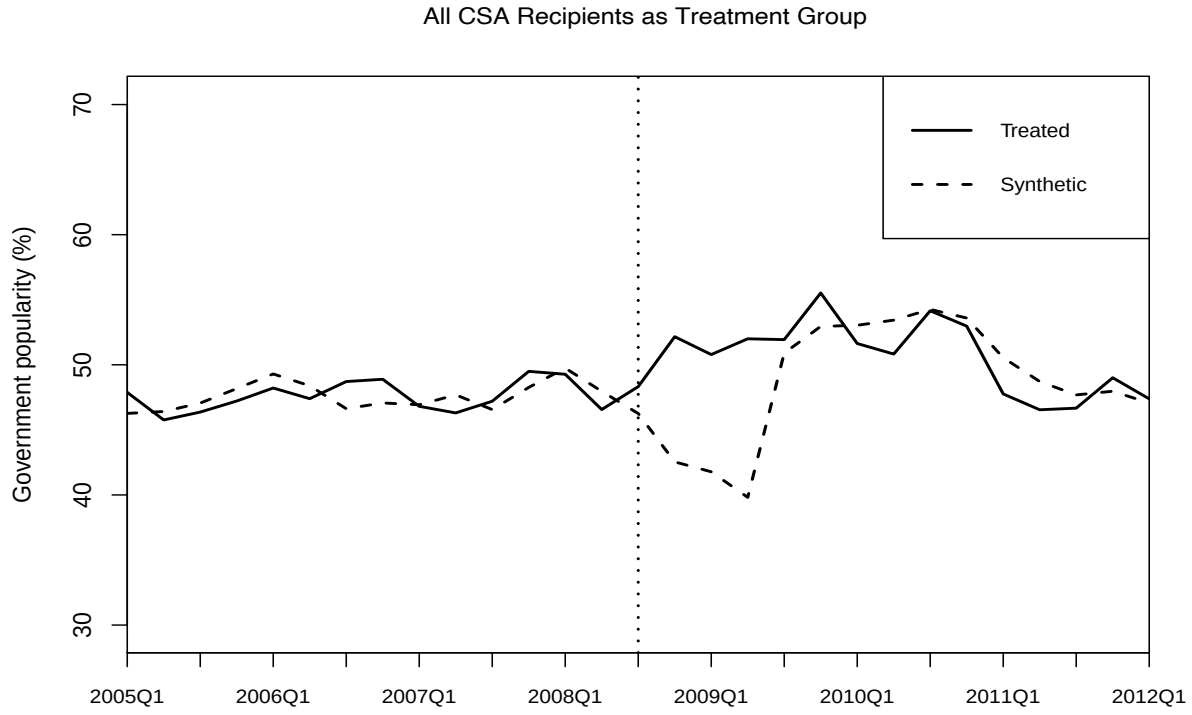
To further address potential selection bias, we re-run the SCM model with only emerging market economies (EMEs). With most CSA recipients being advanced economies like Japan and Switzerland, isolating the effect of CSAs on EMEs would be informative because EME recipients are a group of countries that are 'least different' from non-recipients. The treatment group includes South Korea, Brazil, Mexico, and New Zealand, all of which announced CSAs in 2008Q4.

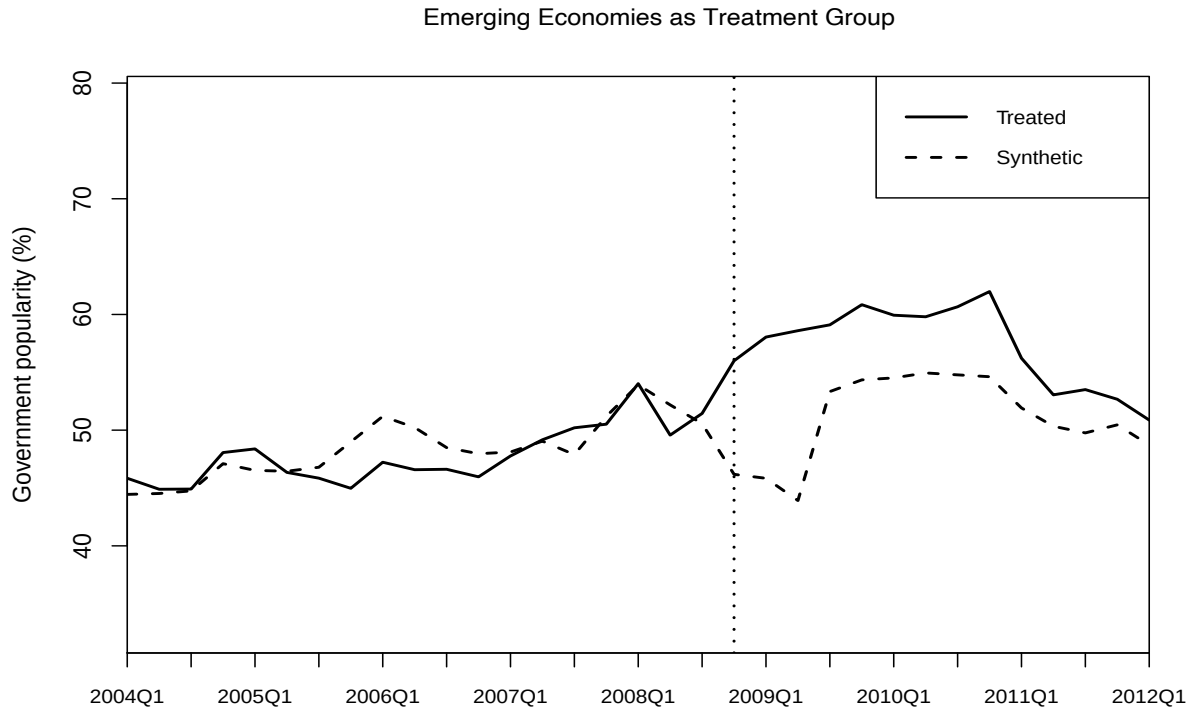
The bottom plot in Figure 4 shows the SCM results using only EMEs as our treatment group. We find that the results are consistent and even stronger.[32] Treated group (CSA recipient EMEs) lost some public support in the beginning of 2008. However, upon CSA announcement in 2008Q4, they recovered their popularity and continued to enjoy the above-pre-crisis level of public support. In contrast, the "synthetic EME country" that did not receive CSAs lost public support for a much longer period, from 2008Q1 to 2009Q2. In other words, EMEs that acquired CSAs in 2008Q4 would have suffered anti-incumbent sentiments if it were not for the CSAs. Gaps in government popularity between the two groups widen as much as 14.7% by the second quarter after CSA announcement, and the gap persists even after the crisis is over. Altogether, the results suggest that the effect of CSAs is stronger among emerging market economies.

31. While studies disagree on the exact date when the GFC is over, in general, the crisis is thought to be over around the second quarter of 2009. For example, the Fed states that the recession ended in June 2009. See https://www.federalreservehistory.org/essays/great-recession-of-200709

32. During the pre-treatment period, government popularity of the treated and untreated groups does not match as closely as it did for our general comparison of all CSA recipients in the top plot in Figure 4. We suspect that this is due to random noises in government popularity data for some of the EMEs, especially Brazil, that cannot be fully predicted in our model.

Figure 4: Government popularity for CSA recipients (Treated) and synthetic recipients (Controls) before and after CSA





Our results from the synthetic control analysis hold across different robustness checks. The results are robust when we vary specifications of countries for the control group as well as the predictors.[33] We also conducted a placebo test where we set our treatment quarter-year at 2007Q2, the quarter when the 2007/8 financial crisis started, to see if our results hold even when the treatment year is mis-specified. Our placebo test shows that there is no significant divergence in 2007Q2. Further details on our SCM specification and robustness checks can be found in Appendix section B.

In addition to the synthetic control analysis, we conducted a series of additional analyses to increase confidence in our results. All of the results discussed in this section are available in the Appendix. First, we test if central bank independence (CBI) mediates the effect of CSAs on government popularity. Our theory suggests that CBI does not have systematic effect on the links between CSAs and government popularity because the public does not know about the role of central banks in arranging CSAs. To test the claim, we control for CBI. We also include the interaction term between CBI and CSA announcement. As expected, the coefficient of neither CBI nor the interaction term achieves statistical significance.

Additionally, we consider IMF programs because IMF programs are another main tool for governments to navigate global shocks, while they also affect exchange rates, monetary policies as well as government popularity. At the same time, the Fed might be less willing to extend CSAs to countries with IMF programs because the country is likely to have already received funding from the IMF. In our sample, six countries had IMF programs during the time we analyze. We find that controlling for IMF programs does not change our results in any substantive way.

Next, another potential omitted variable could be domestic political dynamics. When

33. Using the ten countries that fit the criteria for the donor pool, we tried varying our SCM donor pool with five randomized countries, and found consistent results. Our main result uses all ten countries in the donor pool. Similarly, among the nine predictors we use in our main SCM results, we tested for different combinations of the subset of predictors to check if the results differ for different set of predictors. We found consistent results for most of the different subset of predictors. For further details on the specific predictors and countries see the appendix.

a government faces strong opposition parties, it might face problems both in acquiring CSAs as well as maintaining government popularity in times of economic crisis. To control for the domestic political dynamics, we include a measure of domestic veto players (Henisz and Mansfield 2019). As expected, the coefficient of veto player is negative and statistically significant, however, the inclusion of veto player does not change our main results.

Finally, one could argue that the effect of CSAs is subject to the recipient economy's reliance on trade. Countries relying heavily on trade could suffer more from strong speculative pressure on currency during global crises. Thus, one might argue that these countries are more likely to seek CSAs and to experience a stronger popularity boost when CSAs stabilize exchange rates. We see two holes in the above claim. First, people not involved in trade sector value exchange rate stability as much as those working in trade sector (Steinberg 2021; Ahlquist, Copelovitch, and Walter 2020). Second, existing studies report that trade links with the U.S. do not explain selection into CSAs (Aizenman and Pasricha 2010; Broz 2015). Still, we control for the total trade volume (% of GDP). We also control only for the export (% of GDP). In both models, our results remain robust.

7 Conclusions and Implications

This article demonstrates that governments with Fed CSAs enjoy stronger public support than those without CSAs. When global crisis puts all non-dollar currencies under pressure, governments face a difficult dilemma between external adjustment and internal adjustment. CSAs help resolve the dilemma by counteracting the speculative pressure on currency. As CSAs mitigate the FX dislocation, recipient governments can resolve the dilemma with minimal adjustment. As a response, governments with CSAs experience smaller political costs than those without CSAs during global shocks.

Our findings contribute to the growing studies on CSAs. While previous studies have focused on the political implications of CSAs for the creditor states (i.e., US and China), this work contributes to the literature by focusing on the demand side of CSAs. Our findings suggest that CSAs are an effective shield not only against an economic crisis but also against a government's political crisis. This explains why many governments want to establish CSAs with the Fed upon a global crisis, which stands in stark contrast to governments' reluctance for alternative options such as IMF programs. Given the political benefits accompanied by Fed CSAs, we expect the CSAs to become even more popular and critical in the global economy.

Our findings make important contributions to the broad literature beyond CSAs. First, this article speaks to the studies that link public opinion and financial cooperation. Previous studies suggest that the mass public reacts to financial shocks (Leblang and Mukherjee 2005; Ahlquist, Copelovitch, and Walter 2020; Steinberg 2021). For example, Steinberg (2021) finds that "international financial shocks are just as important for public opinion as trade and migration shocks." Adding to this literature, this article highlights that not only financial shocks but also financial cooperation, which tends to hold low salience among the public, can substantially affect public opinion. While being shaped by international financial cooperation, public opinion also affects international investors' behavior (Bernhard and Leblang 2006; Shim 2022). Thus, our findings indicate that opinion from the mass public and international finance, however being seemingly technical, are systematically intertwined.

In addition, this article engages with the discussion on the role of central banks in the global economy. While many Bretton Woods institutions are highly contested as evident with popular backlash against globalization, our findings show that central bank cooperation can achieve cooperative gains without provoking public resistance. Relatedly, Funke et al.(2016) finds that after financial crises, government majorities shrink, and far-right extreme parties get increased public support. They conclude by stating

that "As a consequence, regulators and central bankers carry a big responsibility for political stability when overseeing financial markets." This article provides concrete evidence in support of their claims by demonstrating that central banks, through CSAs, can contribute to political stability during economic shocks. These findings suggest that the international political economy scholarship should consider central banks not merely as a domestic institution but as an important player in the global economy. At the same time, our findings suggest that CSAs, despite being primarily determined by technocrats, have much more potential to be politicized than commonly assumed. Given that central bank cooperation can generate significant political consequences across countries, it is time to revisit the meaning of central bank independence.

Finally, a fruitful direction for future studies is to investigate spillover effects beyond immediate CSA recipients. There is much to be explored on how CSA recipients can generate secondary spillover effects in their political allies, trade partners, and neighboring countries. For example, a CSA between the U.S. and Japan may have positive spillover effects to other countries engaged in the Chiang Mai Initiative Multilateralization (CMIM). As a multilateral currency swap arrangements among the ASEAN+3, CMI is designed to pool foreign exchange reserves in times of crisis. Japan, as a member of the CMIM, can thus roll-over its CSA dollars from the US-Japan CSA to other members of CMIM. Similarly, dollars acquired from the U.S.-S.Korea CSA can potentially be channeled to the S.Korea-China bilateral swap to stabilize the markets in the region. While this article provides the evidence of CSAs limiting anti-incumbent sentiment in a recipient country during a crisis, the political stabilization effect from CSAs can be greater.

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A Appendix

Figure 5: Bilateral exchange rate movement against the US dollars before and after Fed swap announcements.

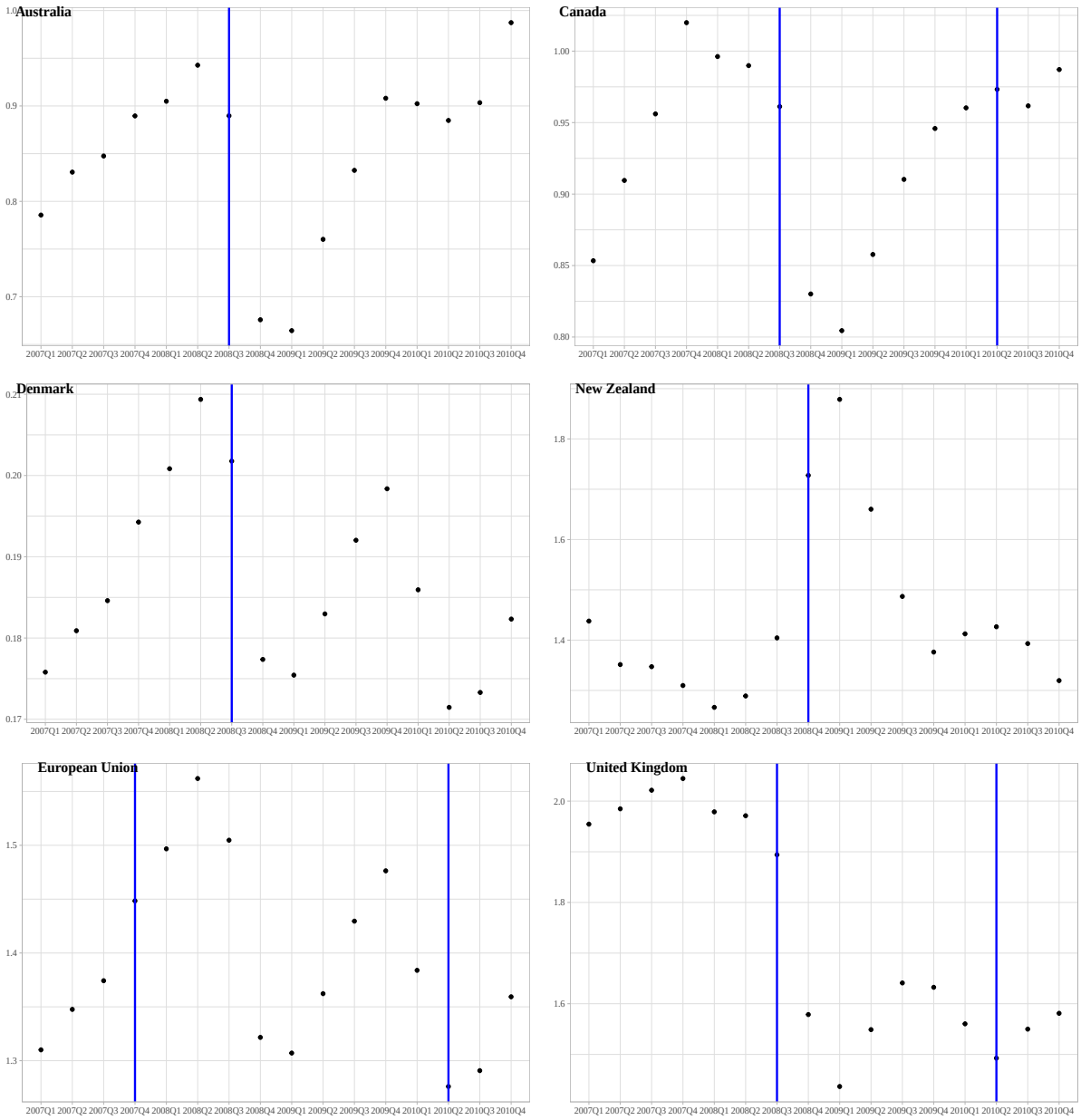
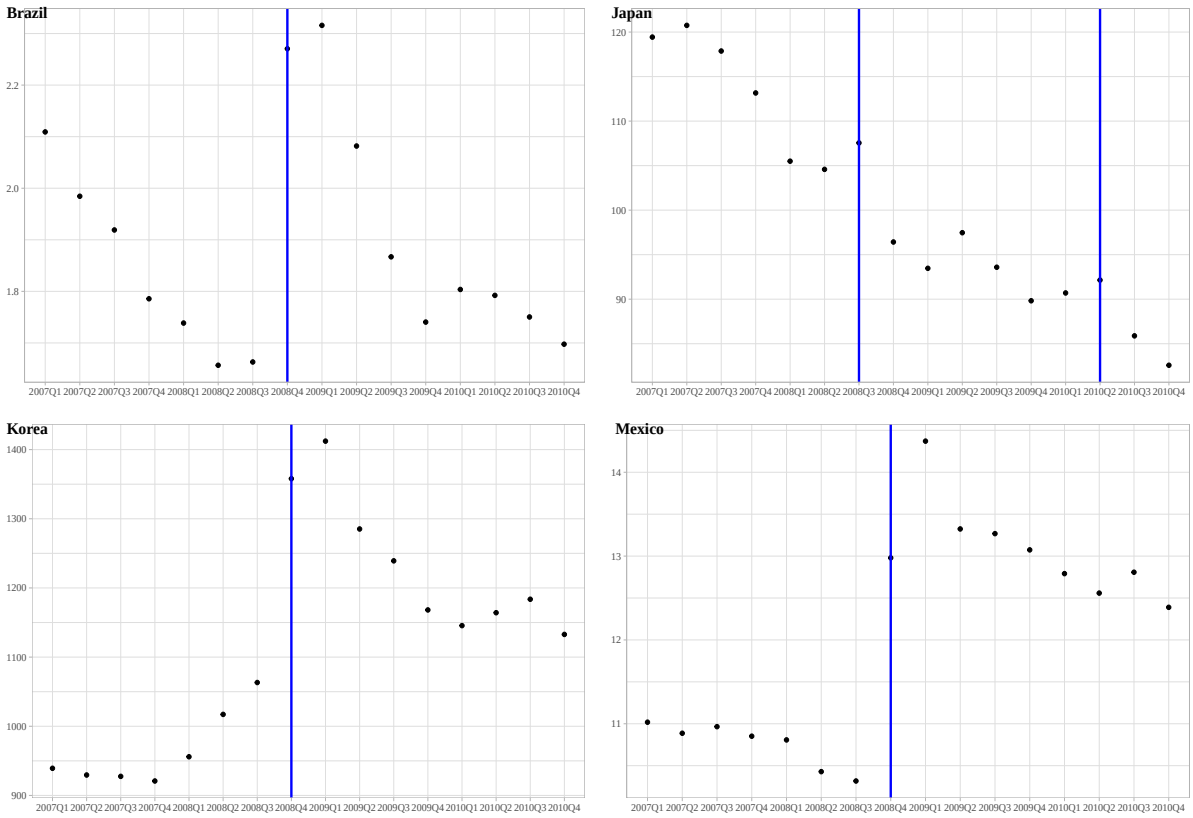


Figure 6: Bilateral exchange rate movement against the US dollars before and after Fed swap announcements.



B Synthetic control addendum

B.1 Pre/Post treatment selection method

We divide the pre-treatment quarter-years and post-treatment quarter-years based on 2008Q3. 2008Q3 is our treatment quarter because CSAs were announced in September of 2008, which is the third quarter of 2008. CSA announcements in Switzerland and Eurozone countries were made earlier than 2008Q3, however, they are not included in our treatment group due to theoretical reasons discussed earlier in text and limits in data availability. In our main analysis, our pre-treatment quarter-years extend from 2005Q1 to 2008Q2. We make sure to have enough data points for the pre-treatment period so that matching on pre-treatment outcomes helps control for unobserved factors. Our post-treatment quarter-years, on the other hand, extend from 2008Q3 to 2012Q1. Theoretically, we expect the effect of CSA announcement to be powerful but not long-lasting. Empirically, we test different lengths of post-treatment years and find that in all cases, the gap between the CSA recipient and synthetic non-CSA recipient converges to zero before 2010Q1. Thus, our post-treatment quarter years cover just enough that extends beyond the expected time window of the effect. Based on additional robustness checks using the interrupted time-series analysis, we find that the effect of CSA announcement on government popularity does not last beyond the time window of four quarters, which is consistent with our findings in the SCM. See appendix B.5 for further details.

B.2 Donor pool selection and predictor sensitivity in SCM

SCM assigns weights to the countries in the donor pool to create a synthetic non-CSA recipient (control group) that best matches the characteristics(predictor variables) of the CSA recipient (treatment group) prior to the intervention. We try to include as many non-CSA recipient countries as possible in the donor pool as long as they satisfy our specifications of the SCM. Our donor pool thus comes down to ten countries that satisfy

the conditions of 1) being a non-CSA recipient, 2) has government popularity data available, 3) has enough variation in the government popularity data in the pre-intervention period and 4) does not have much missing values in the government popularity data in the pre-intervention period. These countries are Argentina, Bulgaria, Bolivia, Chile, Colombia, Czech Republic, Hungary, Iceland, Poland and Turkey. Many country candidates fail to satisfy the last two conditions which are essential in preventing the SCM from degenerating.There were a total of 28 countries that were not CSA recipient and have data availability for government popularity, satisfying the first two conditions. However, there are only 10 countries that satisfy all conditions from 1 to 4.

We exclude two of our control variables - US 10-year treasury bond yields and the election dummy variable - which were included in our panel time-series regression. The two variables are not included in our SCM predictor variables due to the fact that SCM degenerates when predictor variables have low variation or have many missing values during the pre-treatment period. Understandably, US 10-year treasury bond yield and the election dummy variable is expected to have limited variation during the pre-treatment period (2005Q1-2008Q2) which covers less than three years. However, we believe leaving out the two variables is not a big concern given that we expect the information of the election dummy to be captured by the election cycle predictor. Also US 10-year treasury bond yields were controlled in our panel time series regression primarily due to the concerns that it may confound with CSA announcements and not government popularity. Thus, US 10-year bond yield may be less of a predictor variable for government popularity.

B.3 Control group weights and predictor weights

Table 4: Control group with Unit weights

	Country samples in SCM			
Control group	Argentina	Bulgaria	Chile	Colombia
	(0.102)	(0.303)	(0.003)	(0.002)
Donor pool / non-CSA recipient	Hungary	Iceland	Turkey	
	(0.455)	(0.052)	(0.082)	

We only show control countries that were assigned weights. The full list of control countries also include Bolivia, Czech Republic and Poland who were consistently assigned zero weights in multiple iterations with different specifications of the model.

Table 5: Predictor weights

Predictor Variables	Predictor Weights	Predictor Variables	Predictor Weights
Unemployment	0.001	Government popularity 2006Q2	0.066
Current account balance	0.000	Government popularity 2006Q3	0.105
Election cycle	0.102	Government popularity 2006Q4	0.050
GDP growth	0.000	Government popularity 2007Q1	0.057
Domestic credit	0.000	Government popularity 2007Q2	0.132
Government popularity 2005Q1	0.035	Government popularity 2007Q3	0.045
Government popularity 2005Q2	0.066	Government popularity 2007Q4	0.062
Government popularity 2005Q3	0.101	Government popularity 2008Q1	0.067
Government popularity 2005Q4	0.022	Government popularity 2008Q2	0.037
Government popularity 2006Q1	0.050		

B.4 Gap in government popularity

Table 6: Gap in government popularity between the treated unit and synthetic control unit

Pre-treatment		Post-treatment	
Quarter-year	Gap	Quarter-year	Gap
2005Q1	1.614	2008Q3	2.069
2005Q2	-0.646	2008Q4	9.620
2005Q3	-0.691	2009Q1	9.007
2005Q4	-0.956	2009Q2	12.185
2006Q1	-1.079	2009Q3	1.033
2006Q2	-0.989	2009Q4	2.570
2006Q3	2.087	2010Q1	-1.403
2006Q4	1.823	2010Q2	-2.609
2007Q1	-0.121	2010Q3	-0.105
2007Q2	-1.389	2010Q4	-0.625
2007Q3	0.642	2011Q1	-2.789
2007Q4	1.233	2011Q2	-2.171
2008Q1	-0.473	2011Q3	-1.017
2008Q2	-1.400	2011Q4	1.035
		2012Q1	0.322

B.5 SCM: Predictor Means Balance

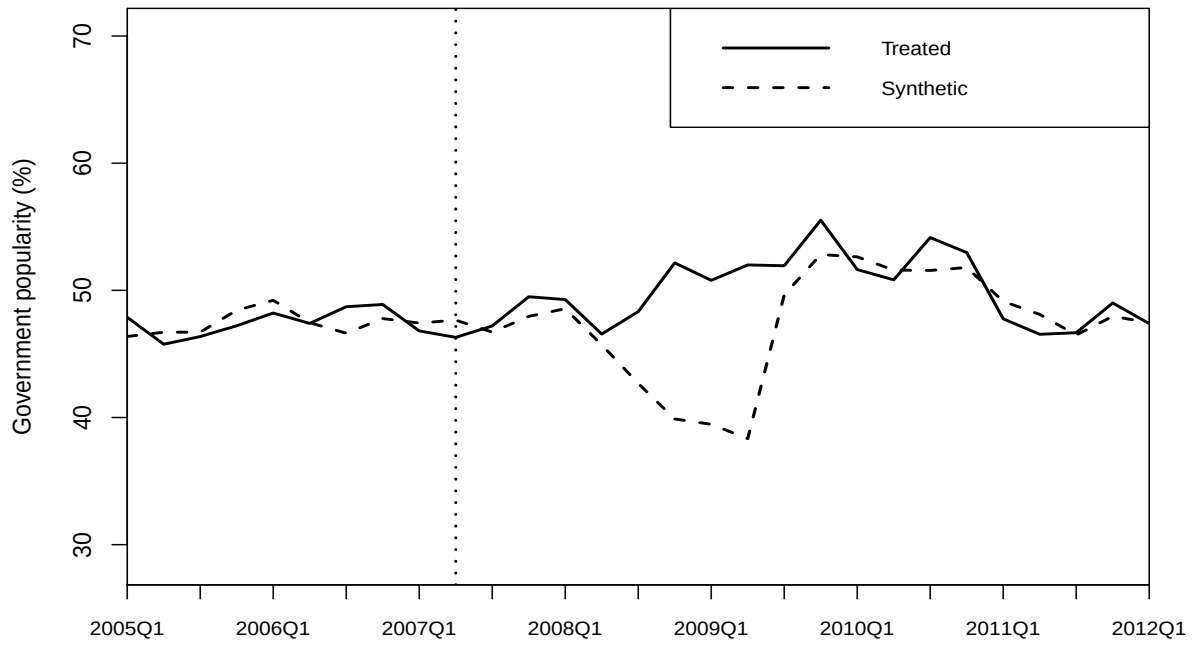
Table 7: Predictor means before CSA announcement

Variable	CSA recipient	Synthetic non-recipient	Sample means
Unemployment	5.318	9.008	8.130
Current account balance	−1.668	−11.247	−4.465
Election cycle	6.112	6.324	6.864
GDP growth	2.999	5.850	5.670
Domestic credit	96.965	52.116	58.826
Government popularity 2005Q1	47.879	46.266	47.535
Government popularity 2005Q2	45.763	46.409	48.204
Government popularity 2005Q3	46.368	47.059	50.417
Government popularity 2005Q4	47.216	48.173	51.384
Government popularity 2006Q1	48.217	49.296	54.692
Government popularity 2006Q2	47.397	48.386	52.581
Government popularity 2006Q3	48.713	46.626	48.040
Government popularity 2006Q4	48.890	47.067	47.260
Government popularity 2007Q1	46.809	46.930	45.933
Government popularity 2007Q2	46.303	47.691	48.605
Government popularity 2007Q3	47.201	46.559	47.788
Government popularity 2007Q4	49.496	48.263	48.577
Government popularity 2008Q1	49.275	49.748	48.679
Government popularity 2008Q2	46.563	47.963	45.578

Our predictor variables for CSA-recipients and synthetic non-CSA recipients show that they are in general well balanced in comparison to the average of all control countries in our donor pool (sample means). Current account balance and domestic credit are higher in synthetic non-CSA recipient while GDP growth is lower. Given these differences, the three predictor variables are assigned 0 weights in our main analysis. In our additional iterations of SCM with different combinations of the predictor variables, we get very similar results where the three said predictor variables are relatively unbalanced and thus given zero weights.

B.6 SCM: Placebo test

Figure 7: Placebo test with treatment at 2007Q2, the beginning of 2007/8 financial crisis



For our placebo test, we specify our SCM with the treatment quarter-year at 2007Q2, the quarter when the 2007/8 financial crisis started. This placebo test helps us test if the

financial crisis contributed to significant differences in government popularity between CSA recipients and the synthetic non-recipients. Our placebo test shows that there is no significant divergence when the treatment is set to 2007Q2. We only find significant divergences in 2008Q3, suggesting that CSA announcement was a significant turning point in producing the gap in government popularity between CSA recipients and synthetic non-recipients. Our findings are consistent even in alternative placebo tests.

B.7 Interrupted Time-Series Analysis (ITSA)

To examine the possibility of lasting effect of CSA announcements, we conduct interrupted time-series analysis (ITSA). First, we compare government popularity between CSA recipients (Treatment group) and non-recipients (Control group) for two years before and after the intervention. Figure B.3 shows the results. In line with the existing literature on economic voting behavior, non-recipients (Control group) face anti-incumbent sentiment during the Global Financial Crisis. Government popularity started to decrease in the late 2007 as the crisis unfolded, and popularity returned to its pre-crisis level only by mid-2009. In contrast, countries with CSAs did not face the anti-incumbent sentiments. Up until late 2007, recipients and non-recipients show very similar trends. However, consistent with our expectation, recipient governments' popularity did not drop during the negative economic shock. Rather, it showed a steady increase throughout the crisis period, suggesting that CSA not only limited but also reversed the anti-incumbent sentiments we often see during economic shocks.

To examine how long the effect of CSA announcement lasts, we apply different time windows in our ITSA analyses. We compare government popularity for three, four, five, and six quarters before and after the CSA announcement. The results are shown in Table 3. In all models, the differences in initial popularity levels between CSA recipients and nonrecipients are not significant, suggesting that parallel assumptions hold before the intervention. We find that government popularity between the two groups are different

at statistically significant levels only until 4 quarters after the CSA announcement. In other words, CSA announcement during the 2008 Global Financial Crisis systematically changed government popularity for recipient countries for about a year.

Table 8: Government popularity for CSA recipients (Treated) and nonrecipients (Controls) before and after CSA

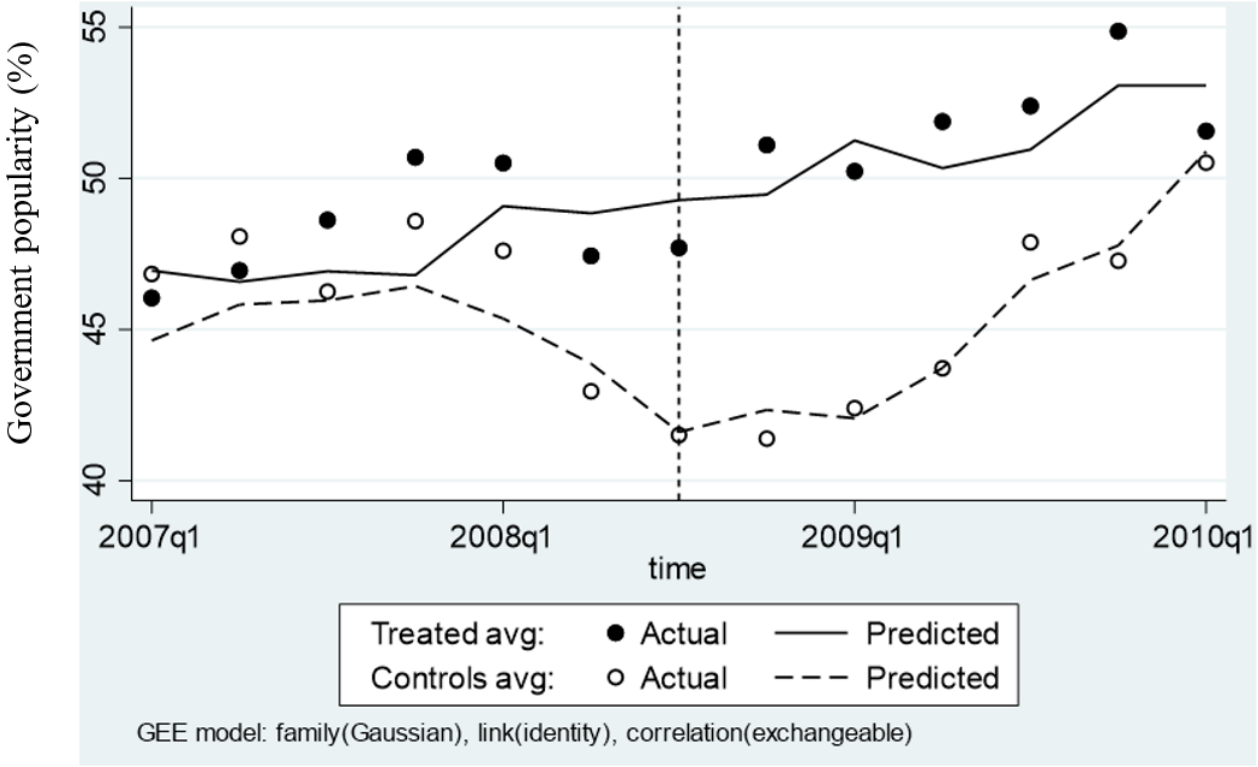


Table B.3: Effect of CSA announcement on government popularity across different time windows

Time windows	Initial mean difference	Effect of CSA announcement
3 quarters	Not significant	6.33*
4 quarters	Not significant	5.62*
5 quarters	Not significant	3.67
6 quarters	Not significant	3.71