

# Are Dollars Popular? The Fed's Currency Swap Arrangements and Recipient Governments' Popularity

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## Abstract

The Federal Reserve has emerged as a global lender of last resort by providing currency swap arrangements to foreign central banks. While existing literature explores swaps' economic consequences and political motivations, there is limited understanding of their political ramifications. We argue that Fed swap lines are associated with higher government approval in recipient countries. Global shocks result in a strong US dollar, creating a dilemma for governments around the world between stabilizing their exchange rates and stimulating their economies. However, Fed swap announcements instantly mitigate currency depreciation, allowing room for expansionary policies, which are popular among publics. Consequently, Fed swap recipients weather global shocks with higher government popularity than non-recipients. Using quarterly data focused on the 2008 global financial crisis, we find that swap announcements are associated with an increase in government popularity. Our findings demonstrate that the Fed, much like other international organizations, can influence foreign countries' domestic politics.

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# 1 Introduction

International financial cooperation plays a crucial role in stabilizing economies, which can in turn influence public support for governments. Over the past decade, the Federal Reserve (henceforth referred to as the Fed) has emerged as a key player in this realm by providing currency swap arrangements (CSAs) during global shocks. Notably, during the 2007–2008 global financial crisis (GFC), the Fed established CSAs with fourteen central banks in major economies, injecting US dollars into dollar-deprived markets and helping to stabilize the global economy. Since then, the Fed has utilized CSAs in response to every major global crisis, including the 2010 Eurozone crisis and the 2020 pandemic crisis. As “the lords of easy money”, the Fed has become a *de facto* international lender of last resort (Leonard [2022](#)).

CSAs, primarily determined by technocrats in central banks, grant the Fed complete autonomy to operate without approval from the US government. The Fed activates CSAs during global shocks when the demand for US dollars is high, causing dollar shortages in the global economy and currency depreciation in both industrialized and emerging countries.<sup>1</sup> In dollar CSAs, the Fed cooperates with foreign central banks by “swapping” US dollars for counterpart currencies to alleviate dollar shortages in recipient countries. CSAs have proven effective and mutually beneficial. On the one hand, CSAs benefit recipients by making it easy to acquire US dollars and by facilitating recipient currency stabilization against the US dollar.<sup>2</sup> On the other hand, CSAs also benefit the US by preventing excessive dollar appreciation.<sup>3</sup> Furthermore, McDowell ([2012](#)) explains that the Fed provides CSAs with defensive motivation to protect against the negative spillovers and potential defaults of internationally exposed US banks.

However, CSAs are far from being purely technocratic tools. The political economy

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1. Fratzscher [2009](#)

2. Aizenman and Pasricha [2010](#); Rose and Spiegel [2012](#); Aizenman, Ito, and Pasricha [2021](#); Perks, Rao, and Tokuoka [2021](#)

3. Destais [2016](#)

scholarship consistently finds that the Fed selectively provides swap lines to serve the US's economic and political interests.<sup>4</sup> While the Fed's expanding capacity has become increasingly controversial within the US,<sup>5</sup> potential recipient governments also explicitly discuss CSAs in their domestic political conversations. For instance, before the South Korea–US summit in May 2022, South Korean politicians and ministers insisted that Fed CSAs should be “positively discussed” at the summit, given the growing strength of the US dollar.<sup>6</sup> Similarly, in 2014, India's top finance ministry official, Arvind Mayaram, urged the Group of 20 leaders to create CSAs to mitigate adverse global shocks.<sup>7</sup> These anecdotes clearly illustrate that politicians as well as central bankers pay substantial attention to CSAs, making it important to analyze whether and how CSAs generate political consequences.

We argue that Fed CSAs, despite being primarily arranged by technocrats, are associated with increased domestic public support for governments in recipient countries. During global shocks, investors chase after safe assets such as the US dollar, causing other currencies to depreciate against it. Depreciations hinder governments from implementing expansionary monetary policies, such as lowering interest rates or increasing government spending, as these actions would exacerbate the depreciation. However, once the Fed announces a CSA, investor confidence in the recipient currency is quickly restored, stabilizing the currency against the US dollar. With reduced currency pressure, recipient governments gain the flexibility to implement expansionary policies, which are popular among the public. As a result, governments with CSAs enjoy higher public approval than nonrecipients.

We evaluate our argument using quarterly data on government popularity for 36 high- and middle-income countries, focusing on the 2008 GFC. To account for selection bias in the Fed's CSA provision, we employ both two-stage regressions with instrumen-

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4. Chey 2012; Broz 2015; Sahasrabuddhe 2019

5. Connell and Shin, (forthcoming); Prasad 2014 (p.205-206)

6. Jung 2022, <https://www.koreaherald.com/view.php?ud=20220509000645>

7. Reuters 2014

tal variables and the synthetic control method. Across different models, we find robust evidence that CSA recipients, on average, experienced a 3.2% increase in government popularity following CSA announcement despite the 2008 GFC shock while nonrecipients saw an 8% decline in government popularity during the same period. This effect is immediate and short-lived, suggesting that the public reacts to the government's policy changes rather than their actual economic impact. We further present suggestive evidence for our mechanism using more fine-grained data on interest rates and the timing of government policy changes, comparing CSA recipients to those whose CSA requests were denied by the Fed.

This study advances our understanding of international financial relations in several ways. First, it adds to the burgeoning literature on CSAs, which have become crucial cooperative policy tools for middle- and high-income countries since the 2008 GFC. The COVID-19 crisis exemplifies their importance, as the Fed re-established temporary CSAs with central banks in over thirty of the largest economies, including Australia, South Korea, Mexico, Brazil, Denmark, New Zealand, Norway, Singapore, and Sweden, among others. The expansion of Fed CSAs indicates that there is both growing supply and demand for this policy. Prior research on CSAs has predominantly focused on the supply side by examining the economic consequences and political motivations of these agreements.<sup>8</sup> The few studies examining the political implications of CSAs tend to focus on creditor countries, such as the US and China.<sup>9</sup> In contrast, our study provides initial evidence that CSAs yield beneficial political consequences for recipient governments, which partially explains the demand for and the expansion of Fed CSAs over the past two decades.

Second, our findings resonate with the growing awareness among policymakers and

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8. 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

9. Chey 2012; McDowell 2012; Broz 2015; Liao and McDowell 2015; McDowell 2019; Vaughn 2020

scholars that central banks' influence extends beyond national borders.<sup>10</sup> We provide concrete evidence that central bank cooperation can promote political stability during global economic shocks. More importantly, we demonstrate how the Fed's policies can impact a foreign country's domestic politics and mitigate the negative political ramifications of global shocks, giving it a role akin to that of international organizations. While our evidence does not reveal whether the foreign political consequences are intentional, it illustrates how the Fed can serve as an additional instrument for the US to favorably support its allies in a capacity that other leading countries are unable to match.

Finally, our findings contribute to the body of research connecting public opinion and international financial and monetary cooperation. Previous studies have explored how the public responds to financial shocks and salient international cooperation, such as IMF programs. Expanding this literature, we highlight that even a nonsalient technical cooperation, such as CSAs, which often goes unnoticed by the public, can have an immediate impact on public opinion by changing government policies.

Although the Fed is not the sole provider of CSAs, we focus exclusively on Fed CSAs because the key component in our argument – currency stabilization against the US dollar – is applicable only to the Fed's swap lines. While many leading countries arrange swaps, with China being the second most active provider, only Fed swaps can result in stabilization of a recipient's currency against the US dollar.<sup>11</sup>

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10. For instance, Andrew Sheng, a former deputy chief executive at the Hong Kong Monetary Authority, said “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” at the East Asian Forum in April 2020. Available at: <https://www.eastasiaforum.org/2020/05/04/cooperation-needed-to-reduce-the-costs-of-unprecedented-central-bank-actions/>. Additionally, see Broz (2015) for scholarly attention on the expanding role of the Fed.

11. In fact, China uses swap lines as a tool of financial statecraft rather than a solution to liquidity problems (Armijo and Katada 2015; McDowell 2019). Not surprisingly, there is no evidence that Chinese CSAs affect a recipient's exchange rates against the US dollar, to the best of our knowledge.

## 2 Currency swap arrangements: What are they? Who receives them?

The most well-known cooperative measure to overcome a financial crisis, including dollar shortages and currency pressure, is probably International Monetary Fund (IMF) programs. However, because IMF loans are often too slow and too small, the US government has devised alternative measures, including unilateral bailouts and currency swap arrangements (CSAs) (McDowell 2017). As global financial systems become increasingly interdependent and more banks and firms accumulate external loans from US banks, the Fed has expanded its role as lender of last resort beyond its national borders. By providing dollars to foreign central banks, the Fed prevents foreign banks from defaults and liquidity crises while also preventing sharp dollar appreciation.<sup>12</sup> At the same time, recipient countries benefit from Fed CSAs by avoiding problems resulting from dollar shortages including currency devaluation, loss of investor confidence, and balance-of-payment problems. These features have led 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 to “swap” a certain amount of US dollars in exchange for the counterpart’s currencies. The currencies are swapped at a fixed exchange rate, ensuring the recipient banks’ access to US dollars during global dollar shortages. Assuming that national central banks are best equipped to distribute dollars in their domestic economies, the Fed does not engage in the domestic distribution of swapped dollars. When the swap reaches maturity, the recipient central bank returns the dollars to the Fed, and the Fed returns the recipient’s currency to the recipient central bank. Thus, the Fed is essentially

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12. McDowell 2012, 2017; Sahasrabuddhe 2019; Destais 2016

taking the risk that a counter-central bank might not be able to return dollars when its CSA reaches maturity. The Fed initially extended CSAs only to central banks of major industrial countries and four major emerging market countries during the 2007–2008 GFC. These arrangements expired in February 2010, only to be reinstitutionalized less than three months later to stabilize the global financial instability arising from the European debt crisis. In 2013, the Fed transformed five lines (those of the ECB, Japan, UK, Canada, and Switzerland) into permanent lines. Upon the COVID-19 crisis, the Fed reactivated the temporary lines.

The official 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.”<sup>13</sup> Studies consistently find that swap lines achieve this policy objective.<sup>14</sup> For example, Moessner and Allen (2010, p.75) 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.”

Despite being an effective policy tool, CSAs are controversial because the Fed selectively establishes them. To date, the Fed has denied requests from at least seven countries: Chile, the Dominican Republic, Iceland, India, Indonesia, Peru, and Turkey.<sup>15</sup> Given that almost all advanced economies have established CSAs with the Fed and many more emerging market economies have requested Fed CSAs, the demand for Fed CSAs seems to be high. The low costs associated with CSAs (i.e., interest rate payments to the Fed) relative to the costs of the alternatives (e.g., using foreign reserves or IMF programs) make CSAs a desirable option for recipient countries in managing a crisis. In contrast, the Fed has reasons to be selective in CSA provision, as found in existing

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13. The Fed’s official website, <https://www.federalreserve.gov/monetarypolicy/bstliquidityswaps.html>

14. Baba, Packer, and Nagano 2008; Aizenman and Pasricha 2010; Moessner and Allen 2010

15. Prasad 2014, cited in Sahasrabuddhe 2019

studies. First, the Fed is more likely to extend swaps to economies with greater US bank exposure because preventing bank defaults in those economies serves US economic interests (Aizenman and Pasricha 2010; Broz 2015).<sup>16</sup> Countries with global financial centers are also more likely to receive CSAs because this characteristic maximizes the beneficial effects of CSAs, such as market stabilization (Broz 2015). Second, US political interests play a key role in swap provision. Chey (2012) argues that the Fed's decisions reflect the US's desire to strengthen ties with emerging market economies. Sahasrabuddhe (2019) further develops this idea, finding that emerging market economies sharing the Fed's policy preference for capital account openness are more likely to receive CSAs. Third, a recipient country's past economic management affects the Fed's decision to provide a CSA. Given that the Fed is taking the risk that the counter central bank is unable to return the dollars at the end of the CSA, the Fed provides CSAs only to credible partners. When a central bank maintains low and stable inflation, it is likely to be considered a credible partner, thus making the Fed more inclined to extend a CSA (Broz 2015).

Taken together, these findings suggest that CSAs function as a tool of US financial statecraft. By selectively choosing liquidity recipients, the Fed provides preferential treatment to those that align with US economic and political interests. While existing studies offer valuable insights into the motives and economic outcomes of CSAs, research on CSA recipients is limited. As a result, we lack a comprehensive understanding of the full ramifications of CSAs and the extent of the preferential treatment that the US provides its "friends" through these arrangements. Furthermore, although a CSA involves a significant dollar injection in an economy, current literature offers little theorization on the connection between CSAs and recipient countries' domestic economic policies. By building on existing studies, we aim to address these unexplored questions.

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16. Having trade links with the US does not affect a country's likelihood of being a swap receipt (Aizenman and Pasricha 2010; Broz 2015).



### 3 The domestic political economy of Fed CSAs

Our argument involves a two-step mechanism. First, during global shocks, virtually all currencies depreciate against the US dollar as investors seek safe assets. However, the announcement of a Fed swap mitigates the foreign exchange (FX) dislocation because investors immediately regain confidence in the recipient currency upon hearing the news of the CSA. Second, with the currency defended in a reasonable range thanks to the CSA, recipient governments have room to implement expansionary monetary policies that help counter global shocks. As a result, CSA recipient governments enjoy higher public approval than nonrecipients.

#### 3.1 Global shocks, a strong US dollar, and CSA announcements

A common sequence of events during global shocks involves investors pursuing safe assets (i.e., gold and US dollars) over high-return assets due to negative market prospects. The high demand for US dollars subsequently leads to significant exchange market turbulence in countries outside the US. For example, Fratzscher (2009) shows that the 2008 GFC led to a sharp appreciation of the US dollar against virtually all currencies, including those of Japan and the Eurozone.<sup>17</sup> Exchange market turbulence resulting from a strong dollar was also observed in recent crises, such as the 2008 GFC, the 2010 euro crisis, and the 2020 pandemic.

Such depreciation shocks should have negative consequences for the public support of governments outside the US. The political economy literature on currency crises has long identified currency depreciation shocks as a crucial factor in reducing government popularity. For example, Ahlquist, Copelovitch, and Walter (2020) demonstrate that the sudden depreciation of the Polish zloty against the Swiss franc in 2015 led voters

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17. The depreciation shock was indeed a widespread phenomenon. Aizenman et al. (2010) find that accumulation of foreign reserves did not prevent a country from being affected by the depreciation shock during the crisis.

exposed to the shock to significantly shift their support from the incumbent to challenger parties. Steinberg (2021) further extends the argument, showing that not only those heavily exposed to the shock but also average citizens withdraw their support for incumbent governments upon currency depreciation. Existing research has identified multiple channels through which currency crashes decrease public support, including reduced real wages, negative job prospects, undermined national pride, and increased skepticism toward the government's competence.<sup>18</sup> Unsurprisingly, currency depreciation reduces government popularity and leaders' likelihood of remaining in office.<sup>19</sup>

As investors flock to the US dollar while offloading other currencies during global shocks, financial institutions worldwide face dollar shortages. To mitigate various problems associated with these dollar shortages, the Fed establishes swaps with other central banks. While swaps are an effective tool for alleviating dollar shortages, they are also found to be useful for correcting FX dislocation, as investors immediately react to the news of swaps. Upon the establishment of a Fed swap, firms and banks in recipient economies suddenly face a much lower risk of balance-of-payment problems, as they have access to a dollar supply from the Fed.

Empirical studies confirm that exchange rate stabilization is one of the key and immediate economic consequences of swaps (Aizenman and Pasricha 2010; Aizenman, Ito, and Pasricha 2021).<sup>20</sup> For example, during the 2008 GFC, swaps systematically ameliorated the exchange rate dislocations of the euro and Swiss franc against the US dollar (Baba and Packer 2009; Aizenman and Pasricha 2010). Aizenman and Pasricha (2010) also found that the announcement of CSAs had significant short-run impacts on the exchange rates of emerging market economies. Similarly, Aizenman, Ito and Pasricha (2021) confirmed that CSA announcements during the 2020 global pandemic led to immediate and significant appreciation of non-US currencies against the US dollar, with the

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18. See Walter 2009; Hobolt and Leblond 2009; Steinberg 2021.

19. Frankel 2005; Walter 2009; Quinn and Weymouth 2019; Steinberg 2021

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

cumulative appreciation reaching 2% by day 5 of the announcement. According to the authors, “the announcements of the Fed liquidity facilities [CSAs] did mitigate the dollar shortage through the confidence channel,” which had an impact even before the central bank disbursed US dollars into an economy (p.13). In short, the announcement of CSAs with the Fed immediately affects investors’ risk perception of the recipient economy and leads to appreciation of its currency.<sup>21</sup> We argue that the restoration of currency values through CSAs creates room for expansionary monetary policies, which can stimulate the economy and boost public satisfaction with the government.

### **3.2 CSA announcements and monetary policies**

The Mundell–Fleming trilemma suggests that internationally open economies can achieve only one of two objectives: monetary policy autonomy or exchange rate stability. During global shocks, when almost all currencies depreciate against the US dollar, governments worldwide face a challenging decision between exchange rate stabilization and countercyclical monetary policies. We suggest that Fed CSAs can alleviate this dilemma by reducing FX dislocations, thereby enabling CSA recipient governments to adopt expansionary monetary policies without being too concerned about further currency depreciation. This, in turn, leads to increased public support for the government because expansionary policies signal a government’s responsiveness to the public’s needs during global shocks. In contrast, CSA nonrecipients, who still face depreciation pressures, cannot adopt countercyclical monetary policies as freely as CSA recipients, leading to reduced public satisfaction with the government.

Let us elaborate on the link between CSA announcement and monetary policies in more detail. Currency depreciation poses a dilemma for governments, where they must choose between defending the exchange rate or letting the currency depreciate. The

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21. Our descriptive evidence also supports the notion that CSAs stabilize exchange rates: the amount of local currency needed for one US dollar increases prior to a CSA announcement (“a depreciation shock”), but shortly after the announcement, the currency quickly recovers from the shock (see Appendix).

problem is that both choices are politically costly. On the one hand, defending the currency requires contractionary monetary and/or fiscal policy adjustments. For example, borrowing reserves increases public debt, and raising interest rates triggers economic contraction and aggravates fiscal imbalances by reducing tax revenues. The “credit crunch” introduced to defend the currency further reduces investments and jobs. On the other hand, letting the currency depreciate is also costly, as it leads to reduced purchasing power, an increased debt burden on dollar-denominated liabilities, and potential inflationary effects due to the price increases for imported goods, thereby eroding the authorities’ monetary credibility.<sup>22</sup> The dilemma becomes more difficult when the pressure on a currency is stronger, as larger FX dislocation requires more significant adjustments. For example, when its currency depreciates by 10%, a government may address the FX dislocation by raising interest rates. However, when the currency depreciates by 30%, interest rate adjustments are unlikely to be sufficient, and several additional austerity measures may be necessary.

We argue that CSAs help mitigate this dilemma by counteracting the depreciation pressure. When Fed CSA announcements ameliorate FX dislocations, as elaborated earlier, governments can either make a minimal internal adjustment to correct the small FX dislocation or accept the small FX dislocation and adopt expansionary monetary policies to boost the domestic economy. In either case, the political cost associated with the adjustment is likely to be smaller than what the governments would have to suffer had they not acquired CSAs. In other words, Fed CSAs liberate governments to some extent from the pressure to defend their currency through austerity measures. The extra room then enables expansionary policies, such as lower interest rates, tax cuts, and increased government spending.

In summary, governments with CSAs are more likely than those without CSAs to achieve exchange rate stability and adopt countercyclical policies simultaneously. Both

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22. 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.

stable exchange rates and expansionary policies should then lead to higher government approval. Even if citizens are not aware of the exchange rate stabilization, government economic policies are salient issues, especially during global shocks. Therefore, announcements of expansionary policies such as tax cuts, increased government spending, and reduced interest rates send a positive signal to the public that the government is taking necessary actions to stimulate the economy. We expect the public to react positively to these signals by increasing its support for the government.

Lastly, our theory holds only when the public attributes exchange rate stability and expansionary monetary policies to national governments. Thus, the theory is less relevant for countries in the Eurozone, where the public is well aware that exchange rate and monetary policies are in the hands not of their own governments but of the European Central Bank (ECB).<sup>23</sup> As a result, the Eurozone public is less likely to reward or punish their national governments for exchange rate movements or monetary policies (Hobolt, Tilley, and Wittrock 2013; Johns 2011).

## 4 Empirical strategy

In this section, we empirically test the key observable implication of our argument that Fed CSA announcements should be associated with increases in the popularity of recipient governments. We use quarterly government popularity data for middle- and high-income countries over the period 2004/Q1–2010/Q4, with a focus on the 2008 GFC period, when the Fed injected over half a trillion dollars into the international economy through swaps. We exclude Eurozone countries for the reasons articulated above. To account for potential selection bias, we employ both instrumental variable approaches

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23. Citizens in the Eurozone believe that the EU, as much as—if not more than—their national governments, should “take effective actions against the effects of financial and economic crises” (European Communities and Commission 2009, 2010, 2011). Similarly, for the question “Which of the following is best able to take effective actions against crisis?” in the Eurobarometer survey, the EU and national government both ranked 1st in 2010, with each selected by 25% of the respondents.

and synthetic control methods, using the country–quarter as our unit of analysis.

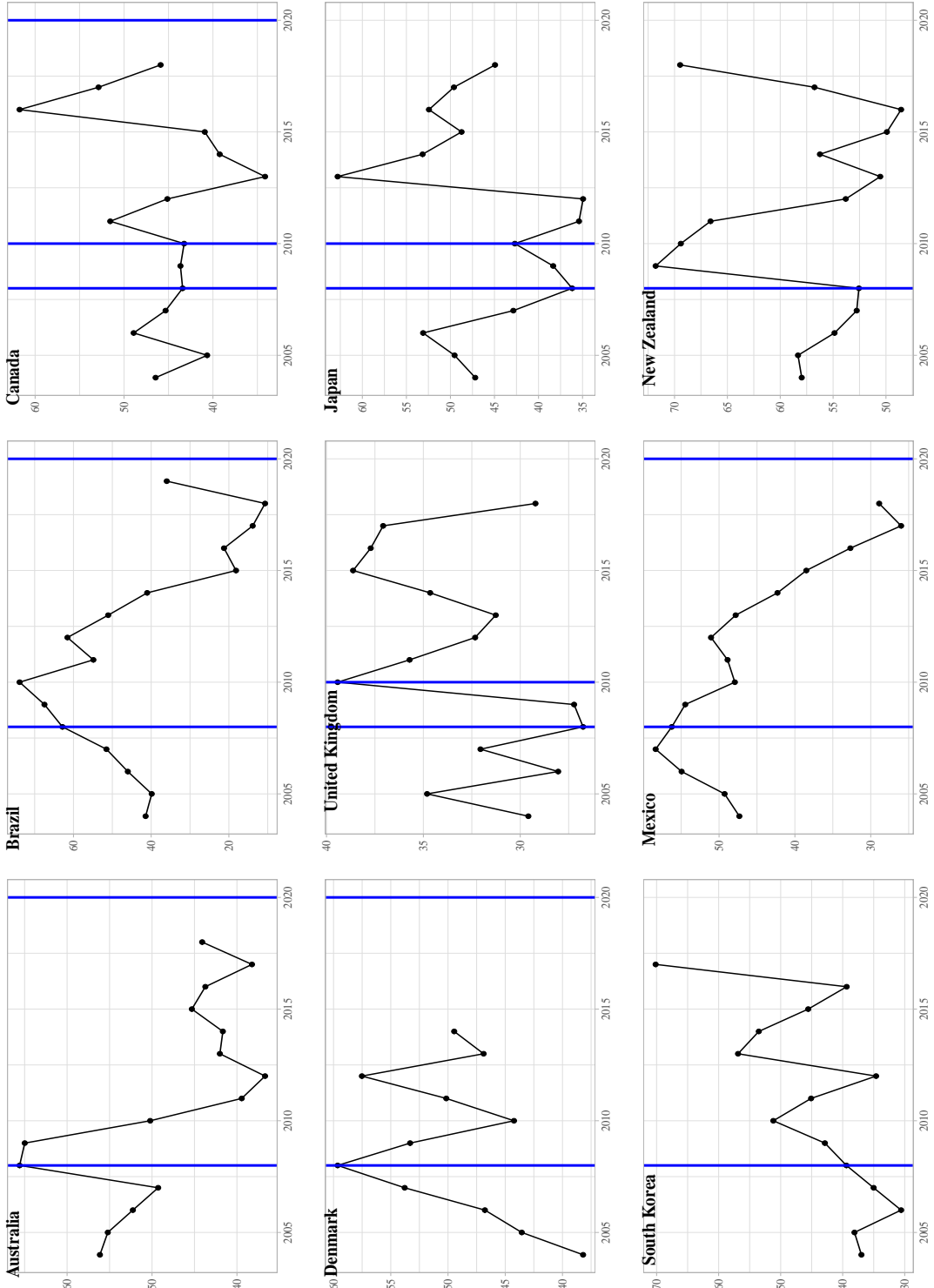
## 4.1 Dependent variable

To measure public support for a government, we use the Executive Approval Projects, the most comprehensive government popularity dataset across countries (Carlin et al. 2019). To construct a reliable and evenly dispersed dataset, Carlin et al. (2019) collect all the available polls for a country and smooth the data points using Stimson’s methods (Stimson 1991). As different polls may have biases in opposite directions, i.e., a poll may tend to under- or overestimate the real popularity, Stimson’s methods cancel out the biases to ease the overall bias. Our analysis is limited to 36 high- and middle-income countries, excluding Eurozone countries, due to data availability on quarterly government popularity.<sup>24</sup> Figure 1 shows the government popularity trends 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. We observe CSA announcements during both periods of low and high government popularity. This is expected given that the Fed announces CSAs to a group of countries all at once, rather than making individual CSAs.

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24. See Appendix for the list of countries included in the analysis.

Figure 1: Government Popularity by CSA Recipient Governments



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

## 4.2 Independent variable

We focus on the announcement of a new CSA because the effect of currency stabilization from CSAs is strongest immediately after their announcement and is relatively short-lived (Aizenman, Ito, and Pasricha 2021). To identify the effect of the CSA announcement on government popularity, we construct a binary variable based on the Fed’s CSA transaction data that takes 1 if a country announced a new CSA with the Fed in a given quarter and 0 otherwise. We lag the CSA announcement by one quarter in our analysis. Table 1 provides the complete list of new CSA announcements made by the Fed between 2004 and 2010, and we analyze the arrangements written in bold, as they are the countries with available government popularity data.<sup>25</sup> While the number of announcements may seem small, each one entails liquidity traded for a minimum of \$10 billion to \$110 billion. This is a scale not available through programs with other organizations, including the IMF. For example, the Fed’s CSAs peaked at \$580 billion during the last quarter of 2008, almost four times the total outstanding IMF credit at its peak in 2011 (Destais 2016).

Table 1: Fed CSA announcements

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

25. The Eurozone countries, Canada, Japan, and the UK 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 outbreak of the Eurozone crisis.



### 4.3 Control variables

We control for factors that may confound the relationship between CSAs and government popularity. We lag all the control variables by one quarter to preempt concerns about post-treatment bias. First, we control for country-specific macroeconomic conditions because underlying economic conditions may affect both the receipt of swaps and government popularity. We control for (log) GDP per capita, growth rates, (log) GDP, the unemployment rate, (log) foreign reserves, and the 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 a CSA with the Fed.<sup>26</sup>

Second, we consider the state of the global economy and a country's vulnerability to global shocks because adverse global economic conditions can impact the Fed's provision of CSAs and potentially reduce government popularity worldwide. To control for global economic conditions, we include 10-yr US bond yields with the idea that higher yields indicate worsening global economic conditions. We also account for a country's financial openness (Chinn and Ito 2008) and exchange rate regime (Aizenman, Chinn, and Ito 2008), as these factors may affect the likelihood of CSA receipt and the political cost associated with global shocks.<sup>27</sup> They could also confound our identification of the suggested mechanism because countries with open financial borders and floating exchange rate regimes are more likely to have currency markets vulnerable to global shocks.

Next, we control for domestic political factors in potential recipient countries. Because election cycles can influence government popularity and potentially the timing of the Fed's decision to extend CSAs, we include the number of years since the last election using the Database of Political Institutions (DPI) (Scartascini, Cruz, and Keefer 2017).

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26. We use the World Banks' World Development Indicator dataset for the macroeconomic measures.

27. For instance, there is a link between the Fed's provision of a CSA and a country's capital account openness (Sahasrabudde 2019).

We further control for government partisanship because both anti-incumbent sentiment during economic shocks and the Fed’s extension of CSAs may depend on government partisanship. Additionally, we take into account veto players in domestic politics using the Political Constraints Index (Henisz 2002), as they may affect government popularity and interfere with central bank cooperation.

Finally, in light of existing findings suggesting that countries with economic interests aligned with the US’s are more likely to obtain Fed CSAs, we consider a country’s dyadic relations with the US. Thus, we include factors such as a country’s status as a US military ally (Barbieri, O. Keshk, and B. Pollins 2016), its exposure to US banks (McGuire and Wooldridge 2005), and its trade volume with the US (Barbieri, O. M. Keshk, and B. M. Pollins 2009).

#### **4.4 Model specification**

To best capture the effect of CSAs on government popularity, we address two challenges to valid inference. First, we must address potential selection bias in CSA receipt, as recipients may systematically differ from nonrecipients. To adjust for any selection bias, we employ the control function approach with instrumental variables (commonly known as the Heckman two-step model).<sup>28</sup> The control function approach involves estimating (1) the selection equation and (2) the outcome equation. The selection equation regresses CSA receipt on controls and instruments with probit models, from which we derive the inverse Mills ratio (IMR). Then, we examine the outcome equation, regressing government popularity on the IMR and the same set of controls, with the IMR capturing potential selection bias as an additional control.

In this study, valid instrumental variables should be associated with the Fed’s provision of CSAs but should not affect a government’s popularity in any ways other than

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<sup>28</sup> This approach is widely used to correct selection bias. For example, see Stubbs and Kentikelenis (2018) for the discussion of selection bias in IMF program participation.

through the CSAs. Drawing on existing knowledge about the Fed’s criteria for selecting CSA recipients, we propose two instruments: (1) the emphasis placed on a country by the Federal Open Market Committee (FOMC) during its internal meetings and (2) whether high-level Fed officials have delivered speeches in a country within the past five years. First, as the Fed’s primary policymaking body, the FOMC holds considerable discretion over swap provision. The FOMC convenes eight regularly scheduled meetings per year to discuss countries of concern, global liquidity conditions, and US monetary policies. The meeting minutes are publicly available, with the exception of those from the most recent five years, and existing studies have extensively utilized them to study the rationale behind the Fed’s CSA provision.<sup>29</sup> Following the literature, we predict that if a country is important to the US for any reason, the FOMC should discuss the country extensively during its meetings and is more likely to extend a CSA to the country. Importantly, however, we do not believe that the extent to which the FOMC discusses a country is causally related to the country’s government approval ratings, given the low salience of the meetings, especially in recipient countries, and foreign publics’ limited access to and understanding of FOMC discussions. Therefore, we gather the FOMC meeting minutes from 2004 to 2010, count the number of times the FOMC mentions a foreign country during its meetings in a given quarter, and use the lagged count as our first instrumental variable. A preliminary examination of the data supports our predictions. While most middle-income countries have never been mentioned in FOMC meetings, Japan was mentioned 26 times on October 29, 2008, and Greece was mentioned 47 times on April 28, 2010, with both being CSA recipients.

Our second instrumental variable is based on the idea that cooperation between central banks requires friendly interpersonal relations between high-level officials. Sahasrabudde (2023), for example, finds that personal relations between high-level central bankers were important for CSA provisions during the 2008 GFC because interpersonal

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29. See, for example, Broz (2015), Sahasrabudde (2019, 2023), and Pape (2021).

trust and goodwill facilitated quick and effective crisis management. In line with this idea, we expect that central banks with closer relationships with the Fed are more likely to receive CSAs. To measure the relationships between foreign central bankers and Fed officials, we use the Fed’s speech archives to examine whether Fed officials have made speeches in foreign countries.<sup>30</sup> We acknowledge that this is not a perfect measure of the relationship, but it can be a plausible proxy because central bankers with an existing network with Fed officials would find it easier to invite them for speeches and Fed officials’ visits to a country are likely to involve multiple networking opportunities to further their interpersonal relations. Since central bankers are likely to utilize existing personal relationships rather than cultivating new ones upon global shocks,<sup>31</sup> we measure the Fed’s speech locations within the past five years instead of those in the previous quarter. Importantly, we suggest that speeches by Fed officials in the past 5 years do not change a government’s popularity, given that those speeches, often made during central bank conferences, rarely receive attention in domestic mass media. Between 2004 and 2010, Fed officials delivered the most speeches in Germany (14), followed by the UK, Switzerland, France, Canada, Japan, Brazil, South Korea, China, Argentina, Puerto Rico, South Africa, Spain, Luxembourg, and Norway, among others.

Beyond selection bias, another challenge to valid inference lies in the properties of the government popularity data, which are susceptible to unit roots and autocorrelation. Utilizing the most common tests, we find that the series does not have a panel unit root.<sup>32</sup> Although stationary, the data exhibit significant autocorrelation, which could bias ordinary least squares coefficient estimates and generate spurious regression (De Boef 2001). Following prior studies, we adjust for time dependence by employing Prais–Winsten

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30. Data available at <https://www.federalreserve.gov/newsevents/speeches.htm>

31. For example, one central banker said “these [interpersonal] relations tend to be more pronounced among long-serving central bankers” (Cited in Sahasrabudhe 2023).

32. We conducted unit root tests through the Maddala–Wu unit root test, Choi’s modified panel unit root test, the KPSS panel unit root test, and the augmented Dickey–Fuller test. All of the results suggest that the data in our sample do not have a panel unit root.

regression with robust standard errors.<sup>33</sup> Prais–Winsten regression is a form of generalized least squares where observations undergo a Cochrane–Orcutt transformation to eliminate autocorrelation. Combining our earlier discussion on selection bias, our primary model estimates the Prais–Winsten regressions with the IMR (selection bias) as an additional control. Furthermore, 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, yields very conservative results. However, incorporating fixed effects is particularly important for our purposes, as we aim to set aside country-specific legacies that may affect CSA receipt and government popularity, such as past experiences with economic shocks.

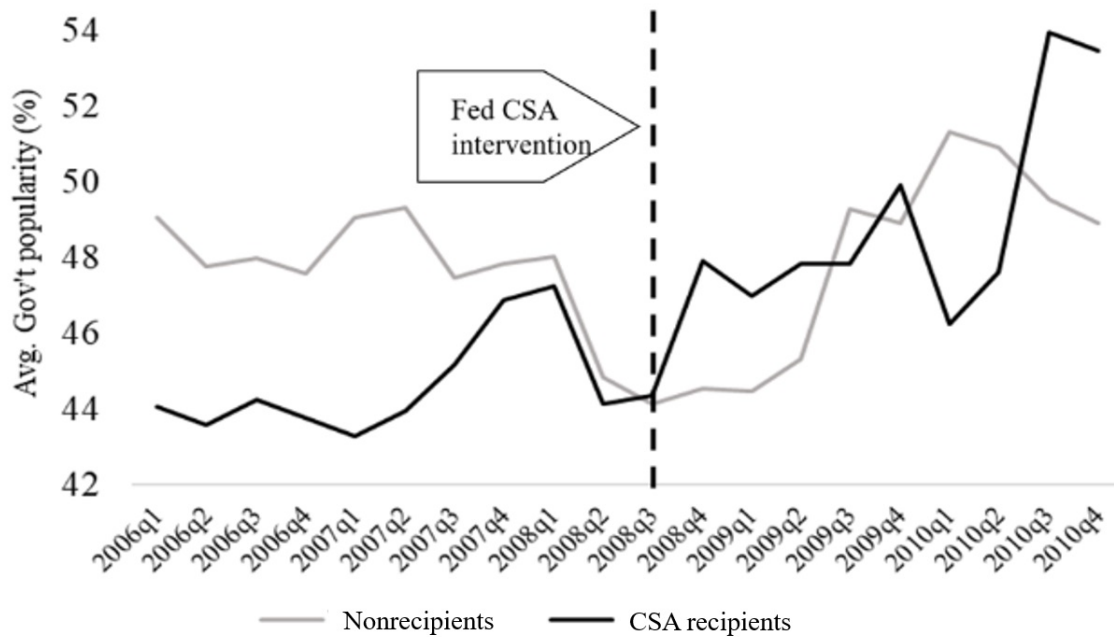
## 5 Evidence: Fed CSA and government popularity

First, we probe the plausibility of our argument by simply comparing the average government popularity between CSA recipients and nonrecipients before and after the 2008 GFC. If our argument is correct, we should observe (i) a consistent loss of popularity for nonrecipient governments during the negative economic shock and (ii) a quick recovery from the loss for CSA recipients upon the CSA announcement. In Figure 2, we find that both predictions hold. Both recipients and nonrecipients experienced a decline in popularity in the first half of 2008, likely due to the negative economic shock. Governments without CSAs did not recover from the popularity loss until late 2009. However, governments with CSAs regained popularity soon after the CSA announcement in 2008 Q3.

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33. Leblang and Mukherjee 2005; Kayser and Wlezien 2011

Figure 2: Average government popularity and CSA announcement



Next, we turn to our statistical analysis. In this article, we present the second-stage results for brevity, while the first-stage results from the selection equation show the expected outcomes.<sup>34</sup> From the first-stage results, we confirm that the coefficients of both instruments are positive, as expected, and mostly statistically significant. Moreover, the F statistics indicate that our instruments are not weak. Table 2 presents the second-stage results of our Prais–Winsten regressions. Model 1 presents the results with only selection bias controlled for. Model 2 incorporates domestic and global economic conditions, and Model 3 further includes political factors. Finally, Model 4 controls for a country’s dyadic economic and political relations with the US. In all models, the transformed Durbin–Watson statistics fall between 1.7 and 1.9, significantly higher than the common threshold of 1.2 for detecting autocorrelation, suggesting that the model errors are no longer serially correlated.<sup>35</sup>

34. See the appendix for details.

35. A Durbin–Watson statistic of 2 indicates an ideal case of no autocorrelation, while a value of 0 indicates strong positive autocorrelation.

Table 2: The Effect of CSA Announcements on Government popularity

|                                    | (1)               | (2)                 | (3)                  | (4)                  |
|------------------------------------|-------------------|---------------------|----------------------|----------------------|
| <hr/>                              |                   |                     |                      |                      |
| DV: Gov't approval                 |                   |                     |                      |                      |
| CSA announcement                   | 2.492*<br>(1.343) | 3.785***<br>(1.445) | 3.161**<br>(1.510)   | 3.200**<br>(1.497)   |
| Selection bias                     | 2.766<br>(3.628)  | 3.441<br>(2.762)    | -1.534<br>(2.960)    | -1.314<br>(2.077)    |
| Credit by domestic banks           |                   | 0.0347<br>(0.0319)  | 0.158**<br>(0.0628)  | 0.155**<br>(0.0648)  |
| (log) GDP per capita               |                   | -20.52<br>(49.89)   | -1.890<br>(53.66)    | -8.015<br>(60.60)    |
| Unemployment rate (%)              |                   | -0.263<br>(0.448)   | -0.506<br>(0.492)    | -0.532<br>(0.500)    |
| Current account balance (% of GDP) |                   | 0.415**<br>(0.171)  | 0.449**<br>(0.179)   | 0.461***<br>(0.174)  |
| 10-yr US bond yields               |                   | -3.175<br>(2.316)   | 3.803<br>(4.286)     | 5.269<br>(4.629)     |
| GDP growth rate (%)                |                   | 0.454*<br>(0.240)   | 0.292<br>(0.232)     | 0.271<br>(0.234)     |
| (log) Foreign reserves             |                   | 1.340<br>(2.194)    | 1.444<br>(2.198)     | 1.810<br>(2.225)     |
| Capital account openness           |                   | 8.509*<br>(4.413)   | 3.613<br>(4.128)     | 4.144<br>(4.014)     |
| Exchange rate stability            |                   | 6.110<br>(4.515)    | 7.420<br>(4.548)     | 7.641*<br>(4.528)    |
| (log) GDP                          |                   | 23.72<br>(48.33)    | 1.892<br>(53.29)     | 8.357<br>(60.85)     |
| Years since last election          |                   |                     | -0.515***<br>(0.142) | -0.514***<br>(0.144) |
| Right-wing government              |                   |                     | 2.727*<br>(1.515)    | 2.746*<br>(1.514)    |
| Veto players                       |                   |                     | -7.024<br>(9.461)    | -6.834<br>(9.615)    |
| (log) US bank exposure             |                   |                     |                      | 1.602<br>(1.868)     |
| (log) US trade volume              |                   |                     |                      | -0.961<br>(5.107)    |
| US alliance                        |                   |                     |                      | 18.12<br>(17.67)     |
| <hr/>                              |                   |                     |                      |                      |
| <i>N</i>                           | 950               | 757                 | 519                  | 519                  |

Standard errors in parentheses

All explanatory variables are lagged by one quarter.

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

As anticipated, the coefficient of CSA announcement remains consistently positive and achieves statistical significance across all models. Overall, the results suggest that CSA announcements are associated with an approximate 3.2% higher government popularity in the subsequent quarter. Although the effect size may seem small, it should not be discounted, particularly in the context of a global crisis when government popularity is expected to drop. Additionally, a small increase in government popularity could significantly impact how the government navigates global shocks. For example, an increase in government popularity leads to a higher bill-passage rate in legislatures, as legislators interpret government popularity as an indication of public preference for the government's agenda, and popular leaders can influence citizens' positions (Calvo 2007; Ostrom and Simon 1985). Furthermore, higher government popularity has been found to enhance public compliance with various economic policies, such as currency reform and pension policies, which are often introduced during shocks (Meneguello 2005). Moreover, international actors adjust their beliefs about a government's credibility based on government popularity, a factor particularly important during a crisis, when state credibility affects international financing (Shim 2022).

The coefficients for the control variables yield the expected results, although few achieve statistical significance. Increases in domestic money supply and current account surpluses are associated with higher government popularity. Higher exchange rate stability also demonstrates a weak association with higher government popularity. We also observe lower popularity the further a government is from the past election. Right-wing governments tended to record slightly higher popularity during 2004 and 2010 when there was a global crisis.



## 6 Mechanism: CSA announcement, exchange rates, and monetary policies

Building on the supportive evidence from quantitative analyses, this section further investigates the validity of our suggested mechanisms. Table 5 compares the annual interest rates and currency depreciation between CSA recipients in fall 2008 and those whose requests were denied by the Fed. The annual real interest rate is a key monetary policy indicator, while currency depreciation against the US dollar demonstrates the extent to which the exchange rate fluctuates. In the last two columns of Table 5, we indicate whether the country adopted countercyclical monetary policies and whether its exchange rate was stabilized during the crisis.<sup>36</sup>

Consistent with our expectations, most CSA recipients were able to stabilize their exchange rates and adopt expansionary policies during the 2008 GFC, whereas most nonrecipients achieved only one of these objectives, if either. Among nonrecipients, India, Indonesia, Iceland, and the Dominican Republic prioritized currency stabilization over economic stimulation by raising interest rates. However, the reduced supply of credit cost jobs and investment. All four of these countries had unemployment rates above 5%, with India having the highest at 10.7% in 2009. The other group of nonrecipients, including Chile, Colombia, Peru, and Turkey, prioritized stimulating their economies through expansionary policies, but all of them except Peru paid a substantial cost, as their currencies remained weak for an extended period.

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36. We code for expansionary if the government cut interest rates between 2008 and 2009. We code the exchange rate as having been stabilized if the currency experienced depreciation equal to or of less than 10% between 2008 and 2009.

Table 3: Interest rates and exchange rates between swap recipients and nonrecipients <sup>37</sup>

|               |               | Interest rate (%) |      |        | Exchange rate fluctuations |        |              | Expansionary policy | ER stabilization |
|---------------|---------------|-------------------|------|--------|----------------------------|--------|--------------|---------------------|------------------|
|               |               | 2008              | 2009 | change | 2008                       | 2009   | depreciation |                     |                  |
| CSA recipient | 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   | .5                         | .6     | 14%          | ✓                   |                  |
|               | Japan         | 2.8               | 2.3  | -.5    | 109.4                      | 94.9   | -13%         | ✓                   | ✓                |
|               | Mexico        | 2.4               | 3.0  | .6     | 12.7                       | 13.0   | 3%           |                     | ✓                |
|               | Brazil        | 35.4              | 34.8 | -.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 recipient | Chile         | 6.0               | 2.5  | -3.5   | 517                        | 547.5  | 6%           | ✓                   | ✓                |
|               | Colombia      | 8.8               | 8.6  | -.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  | .3     | 81.7                       | 127    | 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        | 7.57              | 6.5  | -1.1   | 1.2                        | 1.5    | 26%          | ✓                   |                  |

Source: World Bank database. Interest rates for Canada, Chile, and Turkey are from the Bank of Canada (2023), Gregorio (2010), and Rawdanowicz (2011).

For an examination of policy changes and their timing, we focus on emerging market economies (EMEs) that received CSAs in October 2008 because the timing of the CSA announcement for developed economies (September 2008) coincides with the beginning of the GFC, making it difficult to tease out the CSAs' effect from the general policy response to the crisis itself. A close look at policy responses in EME recipients clearly illustrates how Fed CSAs help them achieve both exchange rate stability and expansionary monetary policies. First, Mexico was concerned about currency depreciation causing inflation, which led it to raise interest rates from 9.3% at the end of 2007 to 9.5%, 9.7%, and 9.9% in the first, second, and third quarters of 2008, respectively. However, once its Fed CSA was announced in October, which helped mitigate peso depreciation, the interest rate finally reversed to 9.8%. Similarly, Brazil had aimed to control inflation through contractionary policies throughout 2008 before it acquired its Fed CSA. Reflecting its heightened concerns about inflation, every meeting of the Banco Central do Brasil in 2008 resulted in an increase in interest rates: 11.25% in March, 11.75% in April, 12.25% in June, 13% in July, and 13.75% in September. However, the trend changed immediately after the Fed's CSA

announcement. On October 28, the Fed announced a CSA with Brazil, and the very next day, the Banco Central held a meeting and finally decided to hold the interest rate steady for the first time in 2008. Then, two months after the CSA announcement, it reduced the interest rate steeply from 13.75% to 12.75%, and in the next six months, it came down further to 8.75%, accompanied by large fiscal policy relief in the first half of 2009.<sup>38</sup>

CSA recipients without inflation concerns exhibited similar changes in government policies upon the CSA announcements. South Korea, a country without inflation concerns, had already lowered interest rates four times in 2008 upon the global shock. While South Korea lowered its interest rate by 0.25% the first three times, it was able to reduce the interest rate 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. The same story applies to New Zealand. Facing the global shock in 2008, New Zealand lowered its interest rate in July, September, and October 2008 by 0.25%, 0.5%, and 1%, respectively. The scale of reduction increased once it acquired the Fed CSA on October 28. In December, New Zealand reduced interest rates by 1.5% and introduced \$500 million worth of infrastructure projects along with eleven tax changes to enable \$270 million in extra cashflow for business.<sup>39</sup> The expansionary policies continued, so that in April 2009, the interest rate reached a historic low in New Zealand. Importantly, these expansionary policies did not put much pressure on the currencies of CSA recipients. The recipient countries experienced strong currency devaluations before the CSAs in 2008, but all of the recipients except the UK managed to stabilize their exchange rates by the fall of 2009, as shown in Table 5. While the limited number of cases makes it difficult to conduct quantitative analysis of the mechanism, the investigation of policy responses and their timing lends strong support for the plausibility of the suggested mechanisms.

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38. Banco Central do Brasil: <https://www.bcb.gov.br/en/monetarypolicy/interestrates>

39. See Treasury report: <https://www.treasury.govt.nz/sites/default/files/2010-04/nzefo-09.pdf>

## 7 Robustness checks

To increase our confidence in the results, we conduct several robustness tests. First, we employ the synthetic control method (SCM). This approach not only helps us further address selection bias but also allows us to determine whether the effect of CSAs on government popularity is long-lasting or changes over time.<sup>40</sup> Understanding the duration of the effect is particularly crucial for determining whether the impact of CSA announcements on government popularity is driven by changes in government policies (a signaling story) or their actual economic outcomes (a pocketbook story). SCM is a widely adopted method in policy studies to evaluate the effect of an intervention by comparing the trajectories of the outcome variable with and without a policy intervention.<sup>41</sup>

There are two groups of fall 2008 CSA recipients: developed economies that received swaps in September 2008 and EMEs that obtained swaps in October 2008.<sup>42</sup> Consequently, we conduct two separate analyses: one with the treatment group comprising the developed economies that acquired swaps in Q3 (September) and the other with the treatment group consisting of EMEs that acquired swaps in Q4 (October). The SCM with the EMEs is particularly informative because EME recipients constitute the group of countries that are the “least different” from nonrecipients. For both SCMs, we first generate a representative recipient by averaging the government popularity of all recipients. Then, we construct a synthetic recipient, which is a weighted average of potential control countries, with the weights chosen to closely reproduce the values of a set of predictors of government popularity during the pretreatment period.<sup>43</sup> Following the

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40. Additionally, SCM can be beneficial if there are concerns that the control countries may not be comparable to the treated countries in terms of their pretreatment characteristics.

41. Abadie, Diamond, and Hainmueller 2015, 2010; Acemoglu et al. 2016; Bohn, Lofstrom, and Raphael 2014

42. We conduct our analysis for 2004/Q1–2010/Q1 to ensure that there are enough data points for the pretreatment period, which is important to control for unobserved factors. We end our analysis in 2010/Q1 to prevent the multiple-treatment problem for developed economies that received CSAs again in 2010/Q2.

43. Our synthetic CSA recipient for the Q3 treatment group is the weighted average of Hungary (0.435), Bulgaria (0.180), Argentina (0.141), Iceland (0.129), Turkey (0.083), and Chile (0.032). The respective values

recommendation by Abadie, Diamond, and Hainmueller (2011), our predictor variables include our control variables and government popularity values in the pretreatment period.<sup>44</sup>

Both SCM analyses yield results in line with our expectations.<sup>45</sup> Figure 3 shows the trajectories of government popularity for the developed economies (top figure) and EMEs (bottom figure) in comparison with those of their respective control groups. In both analyses, there is overall a close match between the recipient and control group governments' popularity during the preintervention period, indicating that the parallel trends requirement is satisfied. Importantly, recipient governments' popularity diverges from that of control groups after CSA announcements.<sup>46</sup> The gaps in government popularity result from both the decline in popularity in the control group and the increase in popularity in the treatment group, suggesting that CSA recipients, similar to nonrecipients, would have experienced a loss in popularity during the 2008 GFC had they not received the swaps. The analyses reveal that the effect of swaps on government popularity is immediate and short-lived, consistent with the signaling mechanism rather than the pocketbook mechanism.

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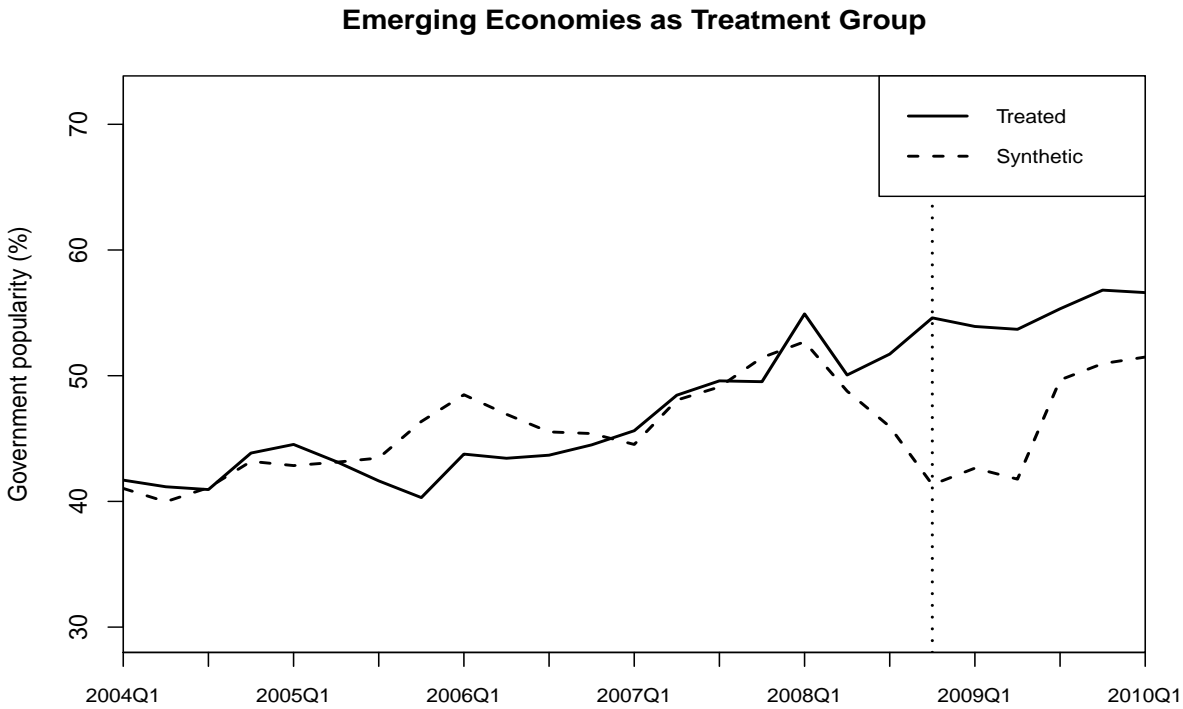
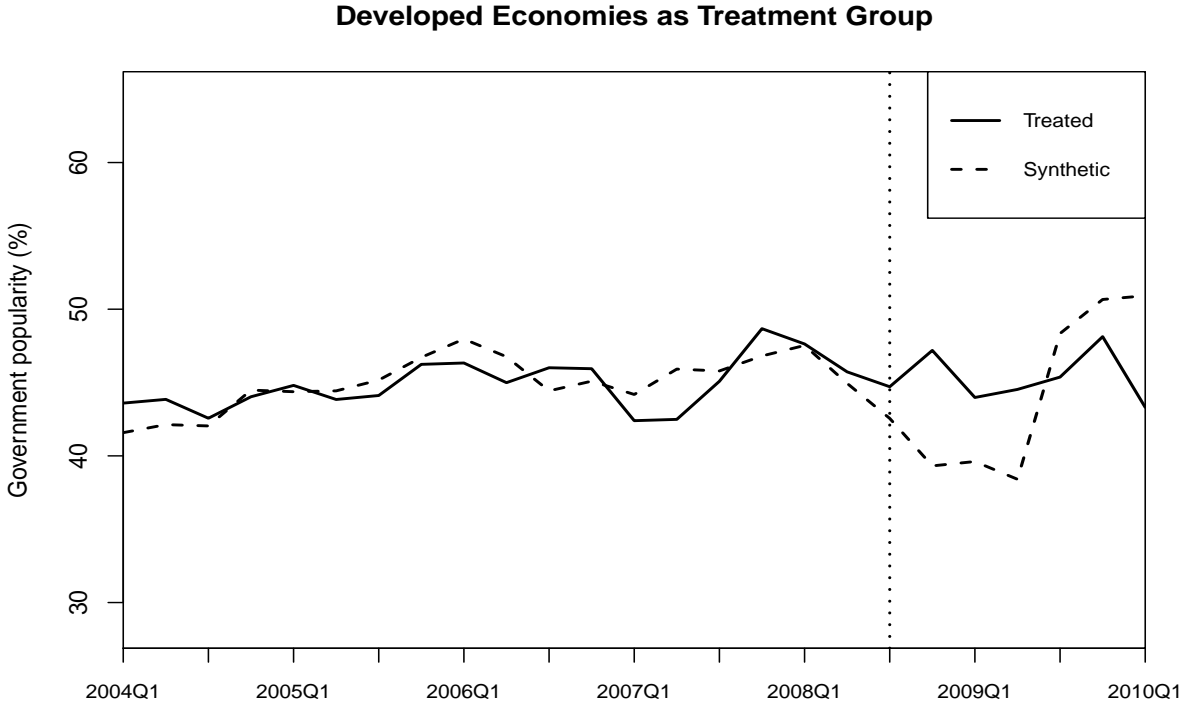
for the Q4 treatment group is an average of Hungary (0.461), Bulgaria (0.313), Iceland (0.127), Turkey (0.099), and Chile (0.001).

44. For the list the control countries, predictor variables, and their weights used to construct the synthetic recipient, see Appendix B.3.

45. The difference in the average treatment effects (ATEs) of our SCM and panel regression results is that for our SCM results, the ATE is calculated as the difference between the actual outcome for the treated unit and the counterfactual outcome, after the pretreatment covariates are controlled for. In contrast, the ATE in our panel regression is calculated as the difference between the expected outcomes for the treated and control groups, after the selection process is controlled for.

46. For EMEs, the gap in popularity between the treatment and control groups begins before the treatment quarter (2008/Q4). We suspect that this is due to the anticipation of CSAs for EMEs given developed economies' receipt of CSAs in the prior quarter (2008/Q3).

Figure 3: Government popularity for CSA recipients and synthetic recipients (control)



In addition to the SCM analysis, we conduct a series of checks with our panel analysis.<sup>47</sup> First, we test whether central bank independence (CBI) moderates the effect of CSAs on government popularity. Our theory suggests that CBI does not impact the relationship between CSAs and government popularity because exchange rate stabilization creates room for expansionary policies regardless of CBI. Moreover, CBI does not affect fiscal stimulus and, importantly, does not change the signal that the public receives regarding the government's taking of countercyclical measures. To examine this idea, we control for CBI and include an interaction term between CBI and CSA announcement. Second, we include IMF programs because they are another primary tool for governments to navigate global shocks, while also affecting exchange rates, monetary policies, government popularity, and swap receipt. Next, one might argue that the effect of CSAs depends on a recipient economy's exports because exporters may benefit from currency depreciation and thus may not approve of the currency stabilization upon CSA announcement. We see two issues with this claim. First, while sustained depreciation benefits exporters, exporters are unlikely to appreciate sudden depreciation at least in the short term because they cannot readily adjust their production to meet higher demand. Furthermore, the cost from exchange rate volatility during global shocks may outweigh the potential benefits from depreciation. Nevertheless, we control for exports (% of GDP) or the interaction terms between exports and CSA announcements. None of the above specifications changes our results substantively.

Finally, we examine an alternative mechanism whereby government popularity could improve with a Fed CSA because securing the CSA signals government competence. This idea assumes that Fed CSAs are a salient issue and that the public perceives securing one as an achievement. We believe that these assumptions do not hold in many countries. For example, by comparing the salience of CSAs to that of the financial crisis using Google search trends between 2007 and 2010, we find that CSAs were relatively salient

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47. All results are available in the appendix.

in South Korea and New Zealand but not in all the other recipients.<sup>48</sup> Furthermore, securing a Fed CSA may signal a government's incompetence, as it relies on external financing to resolve economic problems. Nevertheless, to examine this alternative idea, we test whether the transformation of CSAs into permanent lines is associated with higher government popularity. If the public rewards governments for securing Fed CSAs, then having a permanent CSA with the Fed should send a stronger signal about government competence. We do not find supportive evidence for this alternative mechanism.

## 8 Conclusion

This article demonstrates that governments with Fed CSAs enjoy stronger public support than those without CSAs during global shocks because Fed CSAs enable expansionary policies without endangering exchange rate stability. When global shocks lead to a strong US dollar, all nondollar currencies depreciate. Governments around the world face a difficult choice between stabilizing exchange rates through tightening policies and stimulating the domestic economy at the expense of further depreciation. Amidst such crises, however, Fed CSA announcements mitigate currency depreciation. As currency stabilizes, the recipient government gains room for expansionary policies that are popular among the mass public during global shocks. In contrast, nonrecipients continue to face either currency depreciation or tightening policies, both of which are unpopular among the public, especially during global crises. Consequently, governments that manage to acquire Fed CSAs are likely to have higher approval than those without CSAs during global shocks.

Our findings contribute to the growing literature on swaps. While previous studies have focused on the political implications of CSAs for creditor states (i.e., the US and

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48. When the peak interest in "financial crisis" is set at 100, "currency swap" shows much lower interest scores among most CSA recipients, with some countries showing almost zero public attention to their CSAs: Japan (14), Canada (0), the UK (3), Australia (3), Denmark (0), Norway (0), Sweden (13), New Zealand (65), South Korea (71), Singapore (8), Mexico (8), and Brazil (0).



China), this study focuses on the demand side. Our findings suggest that CSAs are an effective shield against an economic crisis and thereby provide political benefits to recipient governments. Given the political advantages accompanying Fed CSAs, we expect them to become even more popular and critical in the global economy.

Our findings also contribute to the broader literature beyond that on CSAs. First, this article speaks to the links between public opinion and international finance. Adding to the existing studies finding that the mass public reacts to financial shocks,<sup>49</sup> this article highlights that not only financial shocks but also financial cooperation, despite being highly technical and nonsalient, can affect public opinion. Relatedly, while existing literature has focused on how public opinion affects international investors' behavior,<sup>50</sup> we show that public opinion may be endogenous to financial cooperation. Thus, public opinion and international finance, however technocratic, are systematically intertwined.

Finally, this article engages with the discussion on the role of central banks in the global economy and how they are becoming increasingly similar to international organizations. Funke et al. (2016) find that after financial crises, government majorities shrink, and far-right extreme parties gain increased public support. They conclude 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 the authors' claims by demonstrating that central banks can contribute to political stability during economic shocks. These findings suggest that central banks are not merely domestic institutions but also important players 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. Although our evidence does not tell us whether the foreign political consequences are intentional, it shows how the Fed can be another tool for the US to treat its allies favorably on a dimension that cannot be matched by Russia or China.

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49. Leblang and Mukherjee 2005; Ahlquist, Copelovitch, and Walter 2020; Steinberg 2021

50. Bernhard and Leblang 2006; Shim 2022

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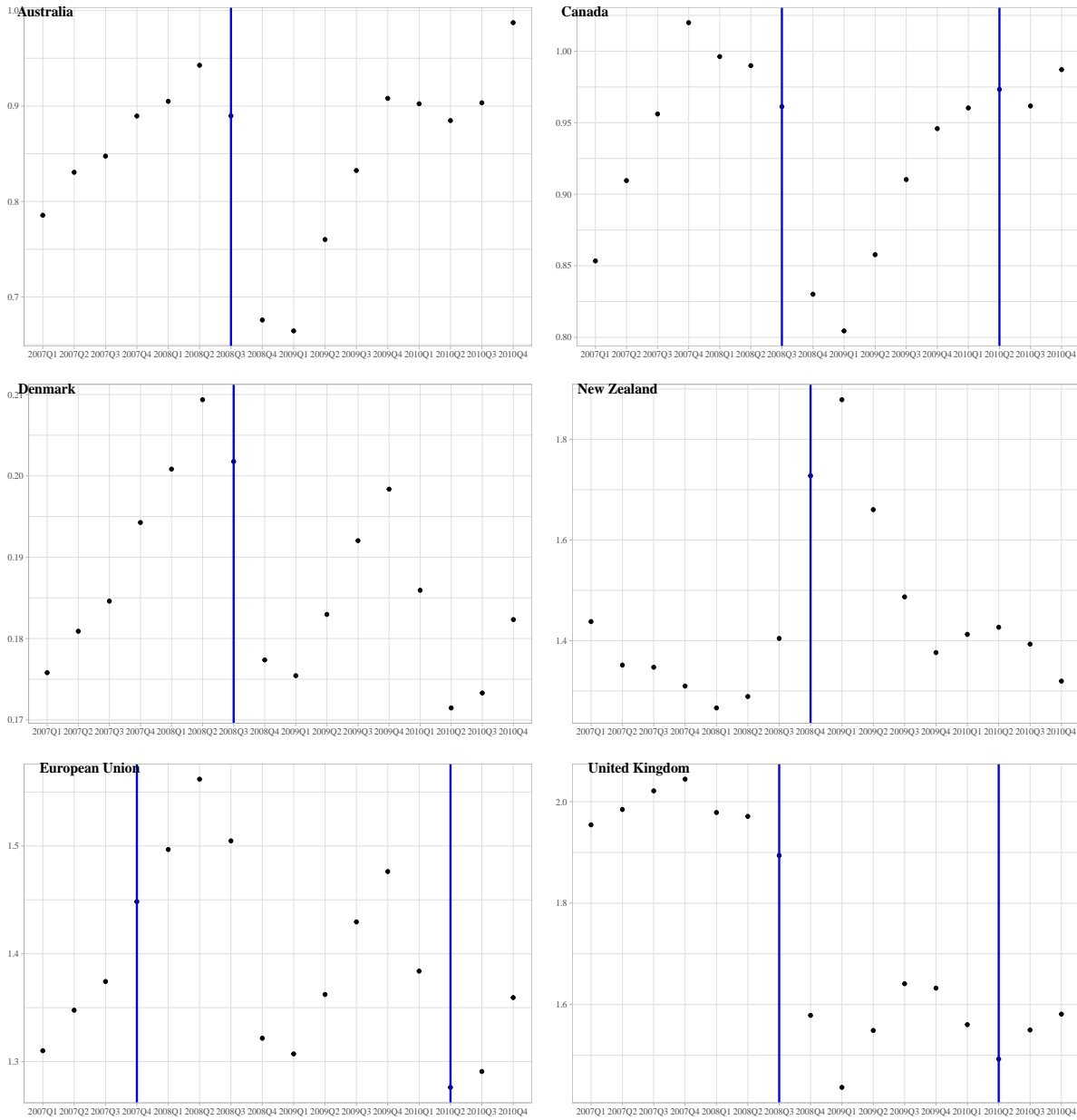
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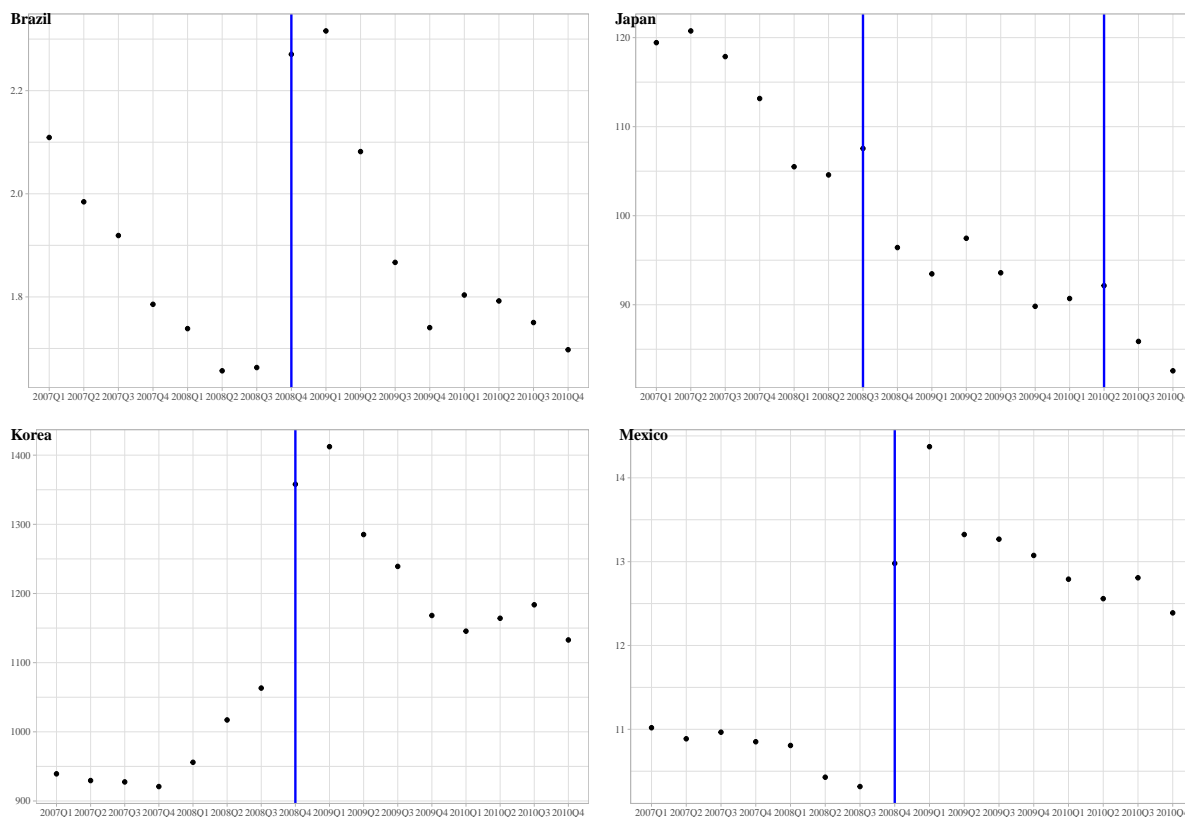


# A Appendix

A.1: Bilateral exchange rate movement against the US dollars before and after Fed swap announcements



## A.1 (continued): Bilateral exchange rate movement against the US dollars before and after Fed swap announcements



## B Summary statistics

| Descriptive Statistics     |     |        |           |         |         |
|----------------------------|-----|--------|-----------|---------|---------|
| Variable                   | N   | Mean   | Std. Dev. | Min     | Max     |
| Government approval        | 983 | 46.897 | 13.761    | 3.464   | 84.061  |
| CSA announcement           | 983 | .012   | .11       | 0       | 1       |
| Domestic credit            | 832 | 62.385 | 54.368    | 9.501   | 304.575 |
| (log) GDP per capita       | 967 | 8.922  | 1.102     | 6.875   | 11.149  |
| Unemployment rate          | 910 | 7.097  | 5.307     | 1.9     | 47.5    |
| Current account balance    | 933 | -2.405 | 6.463     | -25.756 | 17.488  |
| 10yr US bond yields        | 983 | 4.001  | .665      | 2.737   | 5.07    |
| GDP growth rates           | 813 | 3.602  | 3.721     | -15.136 | 11.984  |
| (log) Foreign reserve      | 960 | 23.439 | 1.779     | 19.565  | 27.73   |
| Financial market openness  | 983 | .712   | .289      | 0       | 1       |
| Exchange rate stability    | 937 | .492   | .295      | .069    | 1       |
| (log) GDP                  | 933 | 25.548 | 1.796     | 22.336  | 29.382  |
| Electoral cycle            | 714 | 7.725  | 5.072     | 1       | 24      |
| Right-wing government      | 940 | .298   | .458      | 0       | 1       |
| Veto player                | 913 | .396   | .14       | .036    | .691    |
| (log) exposure to US bank  | 921 | 8.212  | 2.1       | 2.485   | 13.281  |
| (log) US trade volume      | 948 | 9.043  | 1.908     | 1.668   | 13.262  |
| Military alliance with US  | 983 | .927   | .537      | 0       | 3       |
| FOMC statement on country  | 983 | .919   | 3.08      | 0       | 39      |
| FOMC speech within 5 years | 983 | .144   | .352      | 0       | 1       |

## C First stage results

| DV: CSA announcement       | (1)      |        | (2)       |         |
|----------------------------|----------|--------|-----------|---------|
|                            | Coef.    | S.E.   | Coef.     | S.E.    |
| FOMC statement on country  | 0.0189   | 0.0127 | 0.0292**  | 0.0138  |
| FOMC speech within 5 years | 0.412*** | 0.126  | 0.335     | 0.217   |
| Domestic credit            |          |        | 0.00232   | 0.00269 |
| (log) GDP per capita       |          |        | 0.568**   | 0.254   |
| Unemployment rate          |          |        | 0.0314    | 0.0310  |
| Current account balance    |          |        | -0.0159   | 0.0181  |
| 10-yr US bond yields       |          |        | 0.235     | 0.167   |
| GDP growth rates           |          |        | 0.0230    | 0.0277  |
| (log) foreign reserve      |          |        | -0.156    | 0.140   |
| Financial market openness  |          |        | -0.373    | 0.610   |
| Exchange rate stability    |          |        | 0.416     | 0.342   |
| (log) GDP                  |          |        | 0.435*    | 0.250   |
| Years from election        |          |        | 0.0382*   | 0.0199  |
| Right-wing government      |          |        | 0.143     | 0.185   |
| Veto player                |          |        | 1.363     | 1.086   |
| (log) exposure to US banks |          |        | -0.350*** | 0.129   |
| (log) US trade volume      |          |        | 0.163     | 0.129   |
| US alliances               |          |        | -0.497*** | 0.179   |
| F statistics               | 17.08    |        | 7.61      |         |
| N                          | 1647     |        | 846       |         |

Excluding Eurozone countries.

Explanatory variables are lagged by one quarter.

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

## D Robustness checks

|                                  | (1)<br>CBI         | (2)<br>CBI        | (3)<br>IMF         | (4)<br>Exports     | (5)<br>Permanent<br>CSA |
|----------------------------------|--------------------|-------------------|--------------------|--------------------|-------------------------|
| DV: Gov't approval               |                    |                   |                    |                    |                         |
| CSA announcement                 | 3.098**<br>(1.498) | -0.185<br>(4.156) | 3.198**<br>(1.498) | 6.462*<br>(3.666)  |                         |
| Central Bank Independence (CBI)  | 13.64<br>(11.25)   | 12.75<br>(11.38)  |                    |                    |                         |
| CSA announcement X CBI           |                    | 6.526<br>(7.410)  |                    |                    |                         |
| IMF program                      |                    |                   | 0.500<br>(1.602)   |                    |                         |
| Export (% GDP)                   |                    |                   |                    | -0.0377<br>(0.195) |                         |
| CSA X export (% GDP)             |                    |                   |                    | -0.115<br>(0.0982) |                         |
| Permanent CSA announcement       |                    |                   |                    |                    | 0.295<br>(0.838)        |
| All controls included in Table 2 | ✓                  | ✓                 | ✓                  | ✓                  | ✓                       |
| <i>N</i>                         | 519                | 519               | 519                | 519                | 1111                    |

Model 5 expands time coverage into 2020 to include transformation of temporary CSA into permanent ones which happened since 2013.

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

## E Synthetic control addendum

### E.1 Pre/Post treatment selection method

In our main analysis, our pre-treatment quarter-years extend from 2004/Q1 to 2008/Q2 for developed economies and 2004/Q1 to 2008/Q3 for emerging economies. 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 2008/Q3 to 2010/Q4 for developed economies

and 2008/Q4 to 2010/Q4 for developing economies, so that we're able to focus on the effect of the CSA during the 2008 GFC.

## **E.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 are non-CSA recipients and have data available 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 (200/4Q1-2008/Q2; 2004/Q1-2008/Q3) 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 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.

### E.3 Control group weights and predictor weights

#### E.3.1: Control group with Unit weights for developed economies

|                                | Country samples in SCM |          |           |         |
|--------------------------------|------------------------|----------|-----------|---------|
| <b>Control group</b>           | Hungary                | Bulgaria | Argentina | Iceland |
|                                | (0.435)                | (0.180)  | (0.141)   | (0.129) |
| Donor pool / non-CSA recipient | Turkey                 | Chile    |           |         |
|                                | (0.083)                | (0.032)  |           |         |

#### E.3.2: Control group with Unit weights for emerging economies

|                                | Country samples in SCM |          |         |         |
|--------------------------------|------------------------|----------|---------|---------|
| <b>Control group</b>           | Hungary                | Bulgaria | Iceland | Turkey  |
|                                | (0.461)                | (0.313)  | (0.127) | (0.099) |
| Donor pool / non-CSA recipient | Chile                  |          |         |         |
|                                | (0.001)                |          |         |         |

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

### E.3.3: Predictor weights for developed economies

| Predictor Variables          | Predictor Weights | Predictor Variables          | Predictor Weights |
|------------------------------|-------------------|------------------------------|-------------------|
| Domestic credit              | 0.052             | Government popularity 2005Q2 | 0.045             |
| GDP per capita (log)         | 0.038             | Government popularity 2005Q3 | 0.090             |
| Election cycle               | 0.036             | Government popularity 2005Q4 | 0.059             |
| Exchange rate regime         | 0.023             | Government popularity 2006Q1 | 0.126             |
| Dyadic trade (log)           | 0.017             | Government popularity 2006Q2 | 0.137             |
| GDP growth                   | 0.008             | Government popularity 2006Q3 | 0.027             |
| Current account balance      | 0.006             | Government popularity 2006Q4 | 0.048             |
| Unemployment                 | 0.001             | Government popularity 2007Q1 | 0.030             |
| Alliance                     | 0.001             | Government popularity 2007Q2 | 0.015             |
| Capital account openness     | 0.000             | Government popularity 2007Q3 | 0.015             |
| Government popularity 2004Q1 | 0.012             | Government popularity 2007Q4 | 0.024             |
| Government popularity 2004Q2 | 0.002             | Government popularity 2008Q1 | 0.005             |
| Government popularity 2004Q3 | 0.011             | Government popularity 2008Q2 | 0.093             |
| Government popularity 2004Q4 | 0.051             |                              |                   |
| Government popularity 2005Q1 | 0.027             |                              |                   |

### E.3.4: Predictor weights for developing economies

| Predictor Variables          | Predictor Weights | Predictor Variables          | Predictor Weights |
|------------------------------|-------------------|------------------------------|-------------------|
| Election cycle               | 0.111             | Government popularity 2005Q2 | 0.061             |
| Domestic credit              | 0.106             | Government popularity 2005Q3 | 0.012             |
| GDP per capita (log)         | 0.03              | Government popularity 2005Q4 | 0.054             |
| Exchange rate regime         | 0.015             | Government popularity 2006Q1 | 0.183             |
| GDP growth                   | 0.007             | Government popularity 2006Q2 | 0.001             |
| Capital account openness     | 0.005             | Government popularity 2006Q3 | 0.007             |
| Current account balance      | 0.000             | Government popularity 2006Q4 | 0.002             |
| Alliance                     | 0.000             | Government popularity 2007Q1 | 0.036             |
| Dyadic trade (log)           | 0.000             | Government popularity 2007Q2 | 0.024             |
| Unemployment                 | 0.000             | Government popularity 2007Q3 | 0.077             |
| Government popularity 2004Q1 | 0.003             | Government popularity 2007Q4 | 0.001             |
| Government popularity 2004Q2 | 0.005             | Government popularity 2008Q1 | 0.086             |
| Government popularity 2004Q3 | 0.006             | Government popularity 2008Q2 | 0.012             |
| Government popularity 2004Q4 | 0.004             | Government popularity 2008Q3 | 0.147             |
| Government popularity 2005Q1 | 0.006             |                              |                   |

## E.4 SCM: Predictor Means Balance

### E.4.1: Predictor means before CSA Announcement for developed economies

|                              | Treated | Synthetic | Sample Mean |
|------------------------------|---------|-----------|-------------|
| Unemployment                 | 5.010   | 8.811     | 8.559       |
| Current account balance      | 0.225   | 10.828    | 4.152       |
| Election cycle               | 5.122   | 5.527     | 5.894       |
| GDP growth                   | 2.737   | 5.830     | 5.847       |
| Domestic credit              | 130.232 | 66.061    | 55.422      |
| Capital account openness     | 0.940   | 0.668     | 0.643       |
| Exchange rate regime         | 0.389   | 0.461     | 0.407       |
| Dyadic trade (log)           | 11.223  | 7.732     | 8.279       |
| Alliance                     | 1.400   | 0.565     | 1           |
| GDP per capita (log)         | 2.365   | 8.934     | 8.956       |
| Government popularity 2004Q1 | 43.597  | 41.583    | 47.861      |
| Government popularity 2004Q2 | 43.851  | 42.130    | 47.342      |
| Government popularity 2004Q3 | 42.565  | 42.041    | 45.724      |
| Government popularity 2004Q4 | 44.030  | 44.483    | 46.958      |
| Government popularity 2005Q1 | 44.805  | 44.374    | 47.535      |
| Government popularity 2005Q2 | 43.844  | 44.432    | 48.204      |
| Government popularity 2005Q3 | 44.115  | 45.165    | 50.417      |
| Government popularity 2005Q4 | 46.239  | 46.716    | 51.384      |
| Government popularity 2006Q1 | 46.333  | 47.966    | 54.692      |
| Government popularity 2006Q2 | 44.991  | 46.758    | 52.581      |
| Government popularity 2006Q3 | 46.008  | 44.432    | 48.040      |
| Government popularity 2006Q4 | 45.942  | 45.093    | 47.260      |
| Government popularity 2007Q1 | 42.399  | 44.186    | 45.933      |
| Government popularity 2007Q2 | 42.488  | 45.917    | 48.605      |
| Government popularity 2007Q3 | 45.085  | 45.791    | 47.788      |
| Government popularity 2007Q4 | 48.672  | 46.811    | 48.577      |
| Government popularity 2008Q1 | 47.629  | 47.529    | 48.679      |
| Government popularity 2008Q2 | 45.728  | 44.942    | 45.578      |



#### E.4.2: Predictor means before CSA Announcement for emerging economies

|                              | Treated | Synthetic | Sample Mean |
|------------------------------|---------|-----------|-------------|
| Unemployment                 | 5.218   | 9.341     | 8.465       |
| Current account balance      | -1.381  | -10.672   | 4.242       |
| Election cycle               | 5.842   | 5.860     | 6.158       |
| GDP growth                   | 2.872   | 6.109     | 5.718       |
| Domestic credit              | 74.895  | 62.345    | 55.599      |
| Capital account openness     | 0.656   | 0.589     | 0.644       |
| Exchange rate regime         | 0.295   | 0.459     | 0.397       |
| Dyadic trade (log)           | 10.864  | 7.852     | 8.291       |
| Alliance                     | 0.750   | 0.539     | 1           |
| GDP per capita (log)         | 2.269   | 8.776     | 8.973       |
| Government popularity 2004Q1 | 45.840  | 44.753    | 47.861      |
| Government popularity 2004Q2 | 44.890  | 44.324    | 47.342      |
| Government popularity 2004Q3 | 44.908  | 44.324    | 45.724      |
| Government popularity 2004Q4 | 48.065  | 46.790    | 46.958      |
| Government popularity 2005Q1 | 48.380  | 46.291    | 47.535      |
| Government popularity 2005Q2 | 46.348  | 46.619    | 48.204      |
| Government popularity 2005Q3 | 45.850  | 47.199    | 50.417      |
| Government popularity 2005Q4 | 44.972  | 48.473    | 51.384      |
| Government popularity 2006Q1 | 47.228  | 49.399    | 54.692      |
| Government popularity 2006Q2 | 46.581  | 48.175    | 52.581      |
| Government popularity 2006Q3 | 46.619  | 47.640    | 48.040      |
| Government popularity 2006Q4 | 45.964  | 48.077    | 47.260      |
| Government popularity 2007Q1 | 47.768  | 47.859    | 45.933      |
| Government popularity 2007Q2 | 49.169  | 49.929    | 48.605      |
| Government popularity 2007Q3 | 50.204  | 49.558    | 47.788      |
| Government popularity 2007Q4 | 50.515  | 51.503    | 48.577      |
| Government popularity 2008Q1 | 54.019  | 52.861    | 48.679      |
| Government popularity 2008Q2 | 49.572  | 50.177    | 45.578      |
| Government popularity 2008Q3 | 51.443  | 48.115    | 43.862      |

Our predictor variables for CSA-recipients and synthetic non-CSA recipients for both developed economies and emerging economies show that they are in general well bal-

anced in comparison to the average of all control countries in our donor pool (sample means). The predictors that are not well-balanced, i.e. current account balance, unemployment, dyadic trade and alliance, 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 four said predictor variables are relatively unbalanced and thus given zero weights.

## F Sample countries

| Swap recipient sample     |                    |                |
|---------------------------|--------------------|----------------|
| Australia                 | Brazil             | Canada         |
| Denmark                   | Japan              | Mexico         |
| New Zealand               | South Korea        | United Kingdom |
| Non-swap recipient sample |                    |                |
| Argentina                 | Bolivia            | Bulgaria       |
| Chile                     | Colombia           | Costa Rica     |
| Czech Republic            | Dominican Republic | Ecuador        |
| El Salvador               | Guatemala          | Honduras       |
| Hungary                   | Iceland            | Jamaica        |
| Macedonia                 | Nicaragua          | Panama         |
| Paraguay                  | Peru               | Philippines    |
| Poland                    | Russia             | Turkey         |
| Ukraine                   | Uruguay            | Venezuela      |