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Evolution of Bilateral Swap Lines

by Michael Perks, Yudong Rao, Jongsoon Shin, and Kiichi Tokuoka

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Abstract

This paper makes contributions to the study of bilateral swap lines (BSLs). First, this paper fills a BSL information gap by constructing a comprehensive database of BSLs based on publicly available information, including after the onset of the COVID-19 pandemic. Second, the paper provides the results of regression analysis exploring several empirical questions that were not covered in previous studies. The paper documents the evolution of BSLs into an important part of the Global Financial Safety Net (GFSN), with some helping to stabilize financial market during both the Global Financial Crisis (GFC) and the COVID-19 pandemic. Analysis suggests that countries on the recipient side of BSLs are more likely to sign and renew BSLs designed to alleviate balance of payments needs as their external position weakens. U.S. Federal Reserve BSLs appear to have been effective at stabilizing financial market conditions during the COVID-19 pandemic.

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I. INTRODUCTION

The global network of bilateral swap lines (BSLs) expanded dramatically over the past decade.[2] The expansion started during the Global Financial Crisis (GFC), as the U.S. Federal Reserve (Fed) extended BSLs with five major central banks in advanced economies (AEs) (European Central Bank (ECB), Bank of England, Bank of Japan, Swiss National Bank, Bank of Canada), as well as with central banks of other AEs and large emerging market economies (EMs) to ease pressure in dollar funding markets. The Fed renewed the BSLs with the five major central banks in 2010 and converted them into permanent standing facilities in 2013, while allowing BSLs with other AE and EM central banks to expire as market conditions improved. During this period, China also started to expand its BSL network in a bid to promote internationalization of the renminbi and to facilitate trade and investment. As a result, the number of BSLs increased from only a few in 2007 to 74 at end-2019. Since the onset of the COVID-19 pandemic, the global BSL network has grown further, reaching 91 at end-2020, with the U.S. Fed (once again) extending temporary BSLs to nine AEs and EMs.

Despite the expansion of BSLs and their growing role in the Global Financial Safety Net (GFSN), information and analysis on BSLs remain relatively limited. Information on the initiation (i.e., the agreement) of BSLs is usually publicly available, but in most cases the details on their drawings and terms remain confidential. Several studies have analyzed the effectiveness of BSLs but have tended to focus on a narrow subset of BSLs, most notably those among AEs or the Chinese BSLs. Other BSLs, including those provided by Japan, the ECB, Qatar, and UAE, have received less attention.

Against this backdrop, this paper provides a comprehensive overview of global BSLs and conducts empirical work on both the motivations behind BSLs and their effectiveness. This paper provides an overview of BSLs, including their development and drawings, constructing a comprehensive dataset, based on public information. The empirical section then addresses important questions not explored in previous studies. Specifically, the analysis uses the dataset to examine the motivations behind BSLs, where EMs and developing countries are recipients, complementing analysis by Aizenman et al. (2021) that examined motivations behind the Fed's BSLs during the recent COVID-19 pandemic and Lin et al. (2016) that tested the determinants of Chinese BSLs. In addition, this paper tests how effective these BSLs have been at stabilizing market conditions, including during the COVID-19 pandemic. This paper provides the following findings, which should be interpreted with caution given the limitations of the empirical analysis as discussed in Section V:

- **Countries are more likely to sign and roll over a BSL designed to alleviate balance of payments (BOP) needs, as their external position weakens.** While this suggests that

[2] This paper defines a BSL as a currency swap between two central banks or, in some cases, between a central bank and a finance ministry. Currency swaps extended under regional financing arrangements (RFAs), such as the Chiang Mai Initiative Multilateralization (CMIM), are not treated as BSLs.

BSLs have become a valuable part of the GFSN[3], it could also indicate a risk of delayed macro policy adjustments for countries with weakening external positions, particularly given that analysis found little evidence to suggest BSLs are associated with improved macroeconomic policies.

- **Countries are more likely to sign a BSL with China if they have strong trade linkages**. Analysis also suggests a stronger link with countries with a larger export exposure to Chinese goods than with countries that exhibit a major import exposure to Chinese goods.

- **Fed BSLs appear to have been effective at stabilizing market conditions during the COVID-19 pandemic.** The positive impact of Fed BSLs during the pandemic exceeded that typically associated with other BSLs. This finding demonstrates the vital role that BSLs can play in the GFSN, especially at times of severe market disruption and U.S. dollar liquidity shortage.

This paper is structured as follows. Section II provides a literature review. Section III includes a comprehensive overview of developments of BSLs over the past decade, in the context of the continued global integration and the evolving GFSN. Section IV describes key features of BSLs including their mechanics, and section V presents the empirical analysis. Section VI discusses the policy implications, followed by the conclusions.

II. LITERATURE REVIEW

The existing literature has focused on the economic impact of AE BSLs, and Chinese BSLs:

- *AE BSLs.* Bahaj and Reis (2018) concluded that the Fed's swap lines with the five major central banks in AEs: (i) encourage (ex-ante) inflows from banks in a recipient country into assets denominated in the source-country's currency; and (ii) put a ceiling on deviations from covered interest parity, thereby reducing ex-post funding risk. Bahaj and Reis (2019, 2020) and Rose and Spiegel (2012) reported that the Fed swap network was effective at stabilizing financial conditions. More recently, Aizenman et al. (2021) identified motivations behind the Fed's BSLs with the five major AE central banks and found their announcement effects on financial variables.[4] The ECB (2014) noted the effectiveness of the ECB's swap lines are supported by credible commitment to provide

[3] The Global Financial Safety Net (GFSN)—comprising international reserves, central bank bilateral swap lines (BSLs), RFAs, Fund resources, and market-based instruments—aims to achieve three main objectives: (i) provide insurance for countries against a crisis; (ii) supply financing when crises hit; and (iii) incentivize sound macroeconomic policies (IMF, 2016).

[4] Aizenman et al. (2021) also found that U.S. dollar auctions by economies' own central banks (not limited to AEs' central banks), which may or may not be supported by the Fed's BSLs, led to temporary appreciation of these economies' currencies.

sufficient foreign currency liquidity; a pricing policy that hindered opportunistic bidding or stigma; and the alleviation of actual short-term funding needs in foreign currencies.

- *China BSLs.* Lin et al. (2016) analyzed the factors behind the initiation of Chinese BSLs and concluded that the size of bilateral trade is a key determinant of the initiation of Chinese BSLs. Xia (2020) and Zhang et al. (2017) provided evidence that Chinese BSLs promote bilateral trade with China. In contrast, McDowell (2019) questioned the effectiveness of these BSLs in promoting trade settlement in renminbi by showing limited drawings of Chinese BSLs. He argued that China's BSLs can be understood as a form of financial statecraft: the use of national financial and monetary capabilities to achieve foreign policy ends. In this context, he discussed the potential for BSLs to enhance China's economic influence in the current global economic order, concluding that this will depend on China's willingness to act as a unilateral crisis lender and its ability to further internationalize the renminbi.

Other studies have investigated the broader implications of BSLs:

- Destais (2016) noted that BSLs have emerged as a de facto key feature of the international monetary system, led by the Fed's extension of BSLs during and after the GFC and China's major expansion of its BSL network. He noted the unlimited, exclusive power of reserve currency central banks to create money and that BSLs have the potential to play an important role in the GFSN in the context of volatile capital flows. However, he also noted the lack of conditionality associated with BSLs and that BSLs are relatively precarious compared to other elements of the GFSN. Destais (2016) concluded that while strictly regulating the use of BSLs seems unrealistic, an internationally agreed set of principles would enable a fairer, and perhaps more efficient, use of these instruments.

- Mauro and Zettelmeyer (2017) focused on potential improvements in the governance of BSLs and coordination with the IMF. In particular, they suggested extending access to BSLs for large EMs and other AEs which pass the pre-qualification test associated with access to the IMF's Flexible Credit Line (FCL). They suggested a combined BSL-FCL, two step facility, with BSLs providing the first line of defense and a backup IMF financing if a liquidity need persists after an initial period (e.g., six months). They argued that, from the perspective of reserve currency central banks, this has the advantage of being backstopped by the IMF with its experience in evaluating the strength of country policies and institutions, and designing adjustment and reform programs.

III. BSLs IN THE CONTEXT OF AN EVOLVING GLOBAL FINANCIAL SAFETY NET (GFSN)

Global trade and financial integration have advanced rapidly over the past decades (Figures A1 and A2). The global trade network has become more interconnected, both in terms of growing links between countries and increased clustering (IMF, 2016). This reflects the rising importance of EMs, especially China, India and Mexico, and the emergence of EM trade hubs. China accounts for about 13 percent of total global merchandise trade. The size of

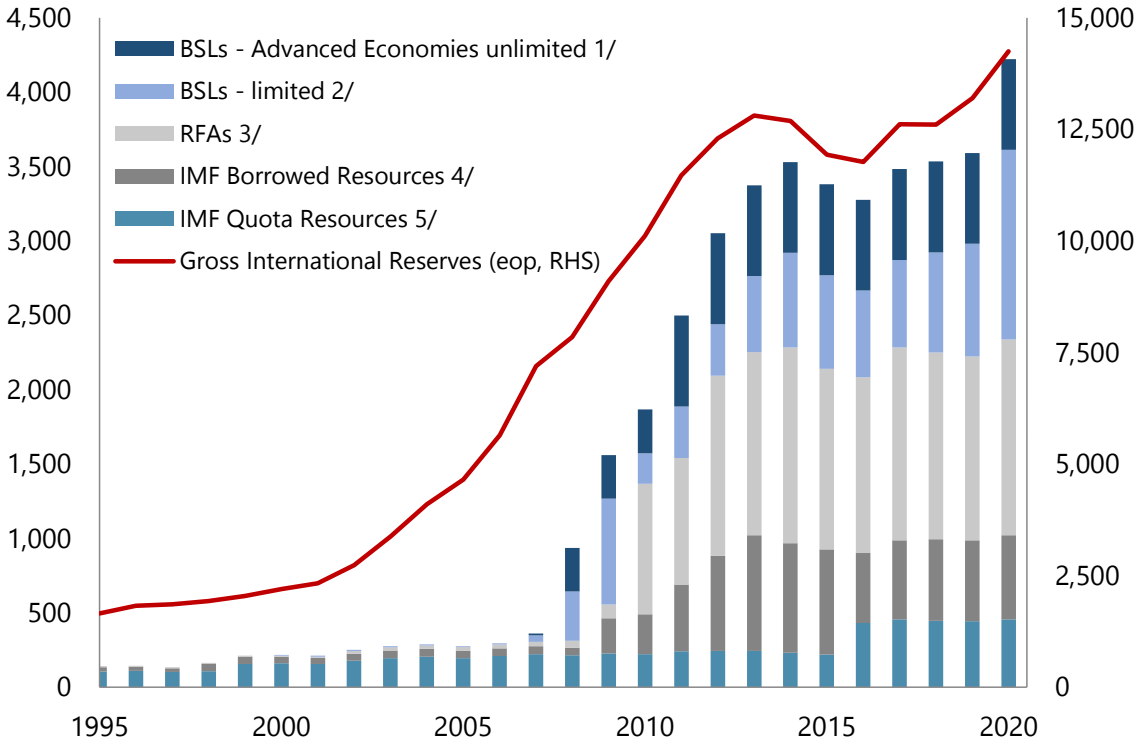
financial linkages have also increased dramatically during this period, with a few key AEs becoming more dominant in cross-border banking activity and the role of EMs remaining limited (Lane and Milesi-Ferretti, 2017). IMF work on the evolution of the international monetary system also highlighted that global financial cycles have increased in amplitude and duration; capital flows have become more volatile; and non-bank finance channels have expanded (IMF, 2016).

Greater trade and especially financial integration can amplify shocks and spillovers, raising the risk of systemic liquidity crises. While AEs continue to dominate cross-border banking, EMs' cross-border liabilities have also increased significantly. Although such linkages can increase risk sharing, they can also increase the transmission of shocks intensifying the probability of a foreign currency liquidity shock (Frost and Saiki, 2014). Despite the increased trade and financial integration, EMs often have limited access to reserve currency while a large share of cross-border activity is denominated or settled in the U.S. dollar, leaving EMs vulnerable to a dollar liquidity shortage.

Against this backdrop, the size of the GFSN has increased significantly. Figure 1 plots the evolution of available (not drawn) resources under the GFSN. The GFSN amounted to about US$ 18.5 trillion at end-2020, of which gross international reserves account for about US$ 14.3 trillion, bilateral swap lines about US$ 1.9 trillion, regional financing arrangements (RFAs) about US$ 1.3 trillion, and the IMF about US$ 1 trillion. Compared with end-2015, the GFSN expanded by US$ 3.2 trillion, mostly due to a reserve build-up, but also in part due to the expansion of the BSL network by around US$ 640 billion.

Figure 1. Evolution of the Global Financial Safety Net, 1995—2020

(available resources in US$ billions)



Notes: Two-way arrangements are counted only once.
1/ Permanent swap lines among major advanced economy central banks (Fed, ECB, Bank of England, Bank of Japan, Swiss National Bank, Bank of Canada). The estimated amount is based on known past usage or, if undrawn, on average past maximum drawings of the remaining central bank members in the network, following the methodology in Denbee et al. (2016, Bank of England Financial Stability Paper).
2/ Limited-amount swap lines include all arrangements with an explicit amount limit and exclude all CMIM arrangements, which are included under RFAs.
3/ Based on explicit lending capacity/limit where available, committed resources, or estimated lending capacity based on country access limits and paid-in capital.
4/ After prudential balances.
5/ Quota for countries in the Financial Transaction Plan (FTP) after deducting prudential balance.

Sources: Central Bank websites; RFA annual reports; and IMF staff estimates.

Table 1. Bilateral Swap Lines (in US$ billions) 1/

	Number of BSLs		Amount of BSLs with limits		Amount of unlimited BSLs 2/ (B)	Total Amount of BSLs (=A+B)
	Global	*o/w* Asia 3/	Global (A)	*o/w* Asia 3/		
2000	3	0	6	0	0	6
2005	3	0	6	0	0	6
2010	25	7	207	110	293	500
2015	67	19	631	328	610	1,242
2019	74	25	757	466	610	1,367
2020	91	28	1,275	496	610	1,885

1/ Amounts of two-way arrangements are counted only once. Excludes BSLs signed as part of regional financial arrangements (e.g., Chiang Mai Initiative Multilateralization (CMIM)).
2/ Permanent swap lines among major advanced economy central banks (Fed, ECB, Bank of England, Bank of Japan, Swiss National Bank, Bank of Canada). The estimated amount is based on known past usage or, if undrawn, on average past maximum drawings of the remaining central bank members in the network, following the methodology in Denbee et al. (2016, Bank of England Financial Stability Paper).
3/ BSLs between Asian countries.
Sources: Central Bank websites; and IMF staff estimates.

BSLs Before the COVID-19 Crisis

The global BSL network has expanded substantially over the past decade. The number of BSLs rose from just a few at end-2007 to 39 at end-2009 (Figure 2), driven by the Fed and ECB BSLs. Other countries, mostly in Asia, also expanded their BSL networks after the GFC. The number of BSLs rose to 67 at end-2015, led mainly by the expansion of China's BSLs (discussed below), and stood at 74 by end-2019. The global BSL network is estimated to have been worth US$ 1.4 trillion at end-2019, dominated by the Fed's permanent standing BSL network among AEs (estimated at US$ 610 billion), and the network of BSLs between Asian countries (estimated at US$ 470 billion), led by China and Japan (Table 1).[5]

- *Fed permanent standing BSLs with the five major AE central banks.* During the GFC, the six major central banks (the Fed, ECB, Bank of England, Bank of Japan, Swiss National Bank, and Bank of Canada) established BSLs to improve liquidity conditions in reserve currency (especially the U.S. dollar and euro) funding markets for financial institutions. In 2013, these six central banks announced that their BSL network would remain permanently in place as a backstop against future strain in the financial markets. On the back of uncertainty surrounding Brexit in March 2019, the Bank of England drew the Euro-pound swap line with the ECB to shore up the financial system.

- *Fed temporary BSLs with nine AEs and EMs.* During the GFC, the Fed also extended BSLs to nine other AEs or large EMs, including Australia, Denmark, Korea, New

[5] Excluding BSLs signed as part of regional financial arrangements.

Zealand, Norway, Singapore, Sweden, Brazil, and Mexico. The BSLs expired in 2010 but were recently reintroduced during the COVID-19 pandemic (discussed below).

- *ECB.* During the GFC, the ECB also provided BSLs to Latvia, Hungary, Poland, Denmark, and Sweden.[6]

- *China.* After the GFC, China led the expansion of the global BSL network. China signed six BSLs in 2009, including with Argentina, Indonesia and Malaysia, and rapidly expanded its BSLs to 32 by end-2015. After 2015, the increase in Chinese BSLs slowed, leaving the number of Chinese BSLs at 30 (worth US$ 500 billion) at end-2019 (see Appendix Table 1 for current Chinese BSLs).

- *Japan.* Previously, Japan had only one BSL with an Asian country (India) at end-2009, apart from its swap lines with Asian EMs as part of the Chiang Mai Initiative Multilateralization (CMIM), a regional financial arrangement. However, by end-2019, Japan's Ministry of Finance (MoF) had expanded its BSL network for BOP purposes to Indonesia, Philippines, Thailand, and Singapore (Top panel of Table A2).[7] The Bank of Japan (BoJ) also maintains BSLs with China[8], Singapore, and Australia to secure local currency liquidity for Japanese financial institutions operating in the counterpart country.[9]

- *Gulf Cooperation Council (GCC).* GCC countries gradually expanded their BSL network following the GFC. For example, UAE had a BSL with India and Korea by end-2019, while Qatar had a BSL with Turkey.

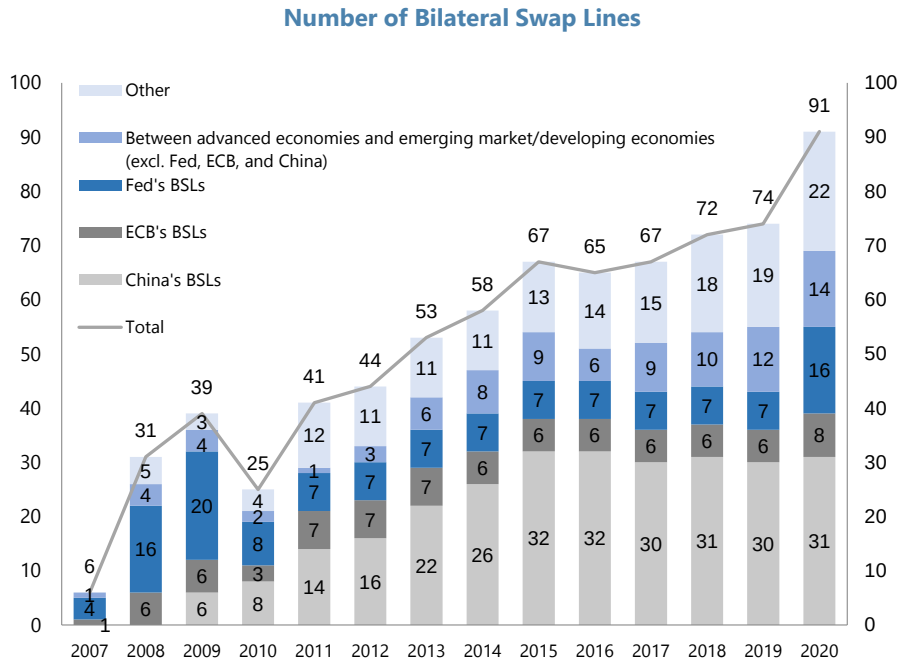
[6] The ECB BSLs with Hungary and Poland were transformed into repo facilities, meaning that the recipient central banks were required to possess the EUR denominated securities to be used as collateral in the repo.

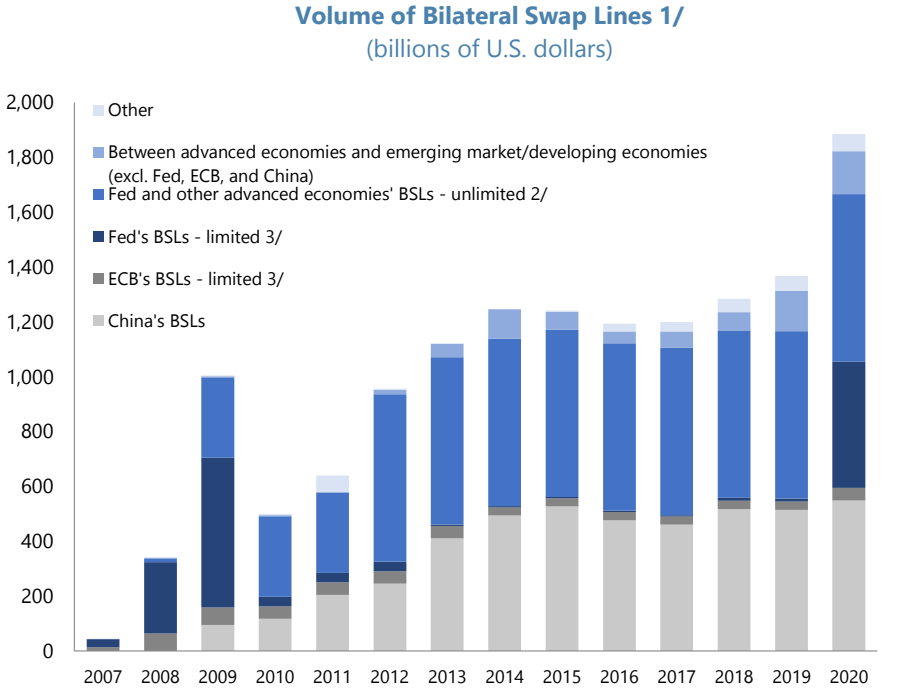
[7] See also Annex XV in IMF (2020).

[8] Japan maintained a similar swap line with China between 2002 and 2013 as part of the CMIM.

[9] Though not a BSL, the Bangko Sentral ng Pilipinas (BSP) and BoJ signed a cross-border liquidity arrangement in December 2014, through which the BSP provides peso liquidity, in emergency situations, to banks operating in the Philippines in exchange for the Japanese yen.

Figure 2. Evolution of BSL Network





1/ Two-way arrangements are counted only once.
2/ Permanent swap lines among the six major central banks (Fed, ECB, Bank of England, Bank of Japan, Swiss National Bank, Bank of Canada). The estimated amount is based on known past drawings or, if undrawn, on average past maximum drawings of the remaining central bank members in the network, following the methodology in Denbee et al. (2016, Bank of England Financial Stability Paper).
3/ BSLs with an explicit limit.

Sources: Central Bank websites; and IMF staff estimates.

BSLs during the COVID-19 Crisis

The global BSL network has expanded further since the COVID-19 crisis, mainly driven by the Fed. The total number of BSLs reached 91 (amounting to US$ 1.9 trillion) by end-2020, mostly driven by the Fed's temporary BSLs with nine AEs or EMs.

- *Fed temporary BSLs with nine AEs and EMs.* The Fed reestablished BSLs with the same set of the nine economies including two EMs (Brazil and Mexico) in March 2020, with its total amount reaching US$ 450 billion (doubling the size compared with during the GFC) (Table 2). These BSLs aim to support global U.S. dollar funding for financial institutions, easing strains in funding markets resulting from the COVID-19 shock and mitigating the effect on credit supply to households and businesses, both domestically and abroad. The Fed extended these BSLs for six months through March 2021, and again through December 2021.[10]

Table 2. The Fed's Dollar Swap Lines (in US$ billions)

	COVID-19 Pandemic			Global Financial Crisis	
	Ceiling	Outstanding		Ceiling	Outstanding
		May 27, 2020 (peak)	End-2020		End-Dec 2008 (peak)
Total		**449**	**18**		**583**
Major advanced economies		**403**	**14**		**501**
Japan	Unlimited	226	0	Unlimited	138
ECB	Unlimited	143	4	Unlimited	302
UK	Unlimited	23	0	Unlimited	34
Switzerland	Unlimited	10	10	Unlimited	27
Canada	Unlimited	0	0	Unlimited	0
Other nine economies	**450**	**46**	**4**	**225**	**81**
Australia	60	1	0	30	23
Denmark	30	4	0.4	15	15
Korea	60	19	0	30	10
New Zealand	30	0	0	15	0
Norway	30	5	0	15	8
Singapore	60	10	2	30	0
Sweden	60	0	0	30	25
Brazil	60	0	0	30	0
Mexico	60	7	1	30	0

Source: Fed

[10] The Fed also announced the extensions of the Fed's repurchase agreement facility for foreign and international monetary authorities (FIMA repo facility). The FIMA repo facility is distinct from BSLs. Under the FIMA repo facility, foreign and international monetary authorities enter into repurchase agreements with the Fed, where these authorities temporarily exchange their US Treasury securities held with the Fed for the U.S. dollar. The FIMA repo facility has supported market confidence through U.S. dollar provision to foreign authorities. The extension of the FIMA repo facility aims at continuing to support the smooth functioning of the US Treasury market by providing an alternative temporary source of U.S. dollars other than sales of securities in the open market.

- *The ECB* signed new BSLs with Bulgaria and Croatia and augmented its BSL with Denmark.[11] [12]

- *China* broadly maintained its BSL network: extending a new BSL with Lao P.D.R (Table A1); increasing the size of its BSLs with Chile, Pakistan, and Hungary; and rolling over its BSLs, including with Egypt, Mongolia, Argentina, and Thailand.

- *Japan's MoF* signed a BSL with Malaysia, and the BoJ initiated a BSL with Thailand (Table A2).[13]

- *Qatar* tripled the volume of its Riyal-denominated BSL with Turkey, of which amount is equivalent to US$ 15 billion.

During the COVID-19 pandemic, the Fed BSL network provided a massive amount of financing as it did during the GFC, while most other BSLs appear not to have been drawn. The total drawing under the Fed BSLs peaked at around US$ 450 billion as of end-May 2020, somewhat smaller than the US$ 580 billion at the peak of the GFC (U.S. Fed's Central Bank Liquidity Swap Operations)

- *Fed's permanent standing BSLs among the six major central banks.* The Fed's BSLs were heavily drawn during the GFC and have been so since March 2020. During the COVID-19 pandemic, the Bank of Japan drew US$ 226 billion at the peak to meet Japanese private banks' strong dollar funding needs in Asia (Table 2). The ECB drew up to US$ 143 billion, while the United Kingdom and the Swiss National Bank drew US$ 23 billion and US$ 10 billion, respectively.

- *Fed temporary BSLs with nine AEs and EMs.* Out of the nine countries, six countries, including Korea (US$ 19 billion), Singapore (US$ 10 billion), and Mexico (US$ 7 billion), drew the BSLs (Table 2). Following the drawing, the Bank of Korea provided 7-day or 84-day short-term loans to financial institutions through auctions, while the Monetary Authority of Singapore (MAS) established the MAS USD Facility to provide 7-day, 28-day and 84-day USD repos to banks in Singapore through auctions.

- *Chinese BSLs.* During the COVID-19 pandemic, Turkey reportedly drew its BSL (amount not announced), but otherwise drawing appear to have been relatively limited. According to China's publication, the outstanding drawing of Chinese BSLs stood at

[11] The Bulgarian lev and the Croatian Kuna joined the Exchange Rate Mechanism (ERM II) in July 2020, which created a unique relationship with the ECB. In ERM-II, the exchange rate of a non-euro area Member State is allowed to fluctuate against the euro within set limits, while interventions are coordinated by the ECB and the central bank of the non-euro area Member States. The General Council of the ECB monitors the operation of ERM II and ensures co-ordination of monetary- and exchange-rate policies (ERM II - the EU's Exchange Rate Mechanism).

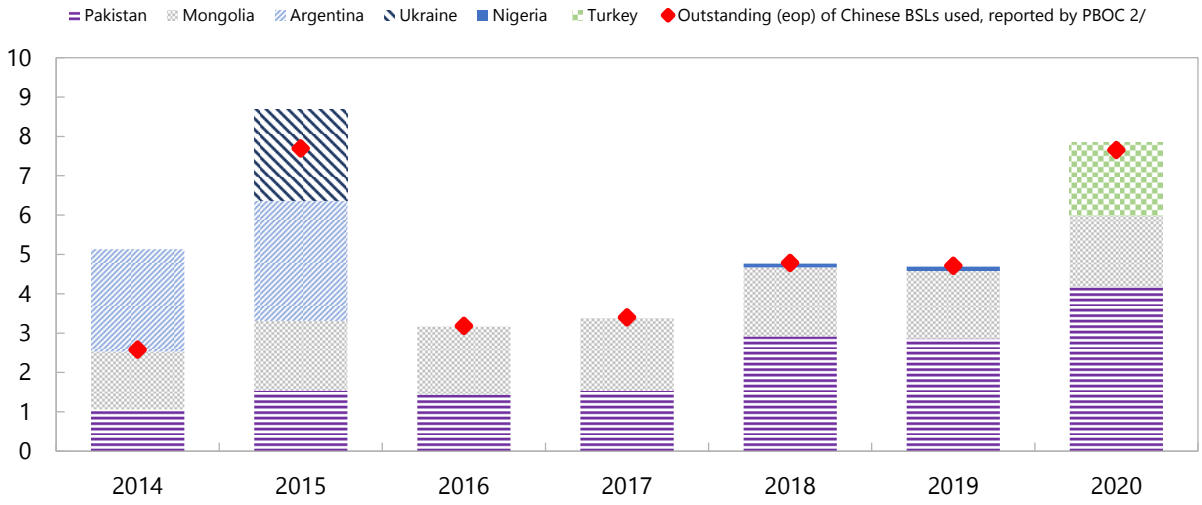
[12] The ECB provided repo lines to the central banks in North Macedonia, Albania, Hungary, Romania, Serbia, and San Marino.

[13] Japan's MoF maintains a separate BSL with Thailand.

around US$ 8 billion at end-2020, dominated by drawings by Mongolia and Pakistan (Figure 3).[14]

- *Japanese BSLs* appear to remain undrawn.

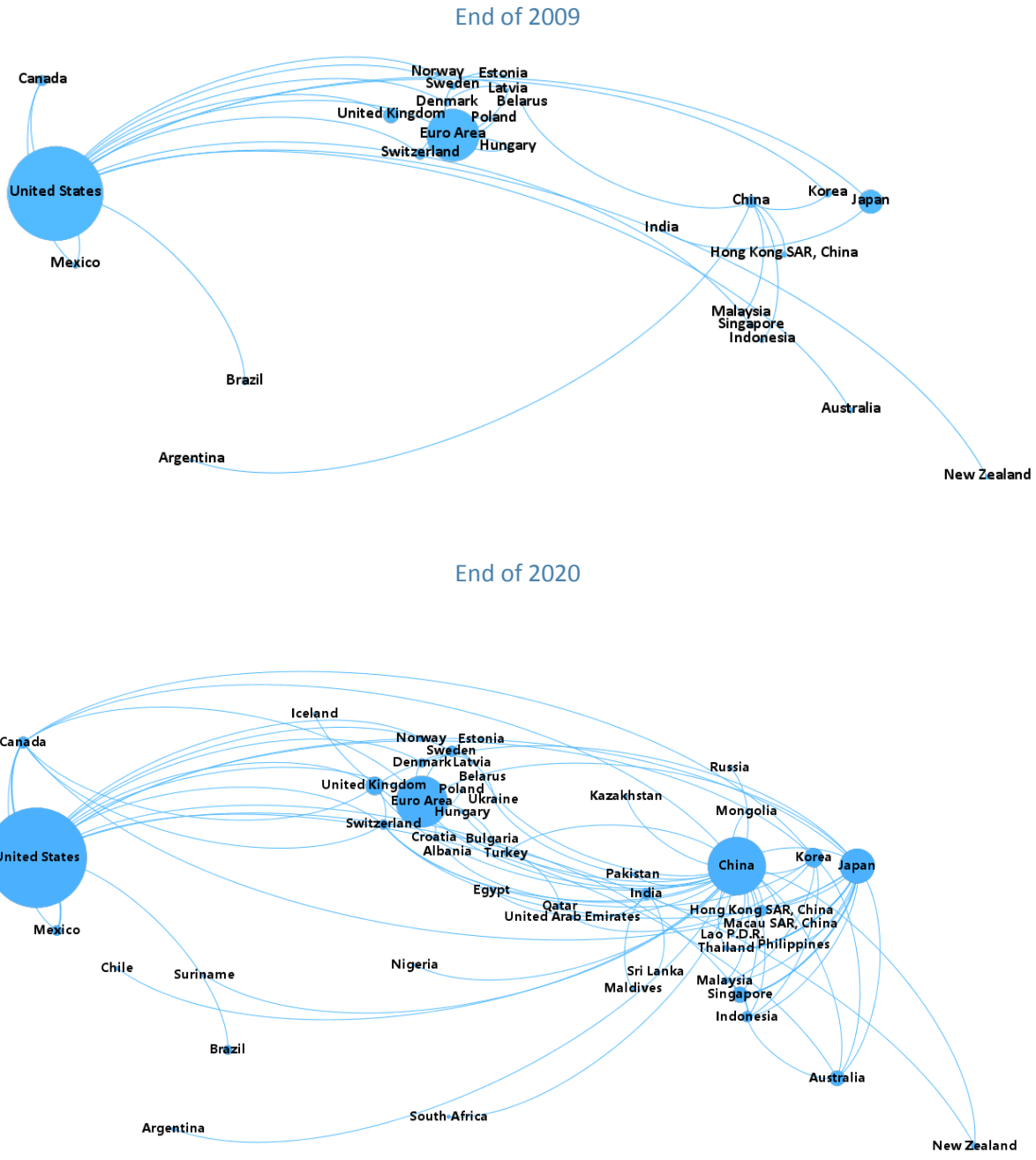
Figure 3. Drawing of China's BSLs (in US$ billions) 1/



Sources: BCRA, BOM, CBN, CBRT, NBU, PBOC, SBP, and IMF staff reports.
1/ For Argentina, Mongolia, Nigeria, Pakistan, Turkey, and Ukraine, the amount of usage (flow) in the year is estimated based on the authorities' publications.
2/ Outstanding (eop) of Chinese BSLs used by foreign monetary authorities, reported by the People's Bank of China (China Monetary Policy Report).

[14] This amount broadly matches figures published by recipient countries.

Figure 4. Evolution of BSL Networks 1/



1/ The size of each bubble represents the total amount of BSLs in U.S. dollar terms.

Sources: Central Bank websites; and IMF staff estimates.

IV. KEY FEATURES OF BSLS

This section discusses the mechanics, objectives and key features of BSLs, using the authors' dataset based on the publicly available information (e.g., news reports, authorities' publications).

Mechanics

A BSL is used (drawn) by exchanging currencies between two central banks.[15] Typically, the two parties agree to provide their own currency in exchange for the equivalent amount in their counterpart central bank's currency, based on the market exchange rate at the time of transaction (US Fed's Swap Lines FAQs). The parties agree to swap back these quantities of their two currencies at a specified date in the future, which could be the day after the swap is drawn or as far ahead as three months, using the same exchange rate as in the first transaction. Because the terms of the second transaction are set in advance, fluctuations in exchange rates during the period do not alter the eventual payments.

In most BSLs, there is an implicit recipient country. Upon the drawing of a BSL, both countries receive the counterparty's currency. Although both countries are technically 'recipients', in most cases one party receives a hard currency (e.g., U.S. dollar) in exchange for a soft currency. In BSLs involving two reserve currency-issuing countries, both provide hard currencies (e.g., Japan–Australia swap) and both countries may be seen as recipient countries.

In principle, only drawn BSLs should be counted as gross international reserves. This is because reserve assets must be readily available and in control of the country's monetary authorities. Lines of credit that are undrawn and foreign exchange resources that could be obtained under BSLs are not in principle reserve assets because they do not constitute existing claims. Such lines of credit are, however, to be reported under contingent foreign exchange resources (IMF, 2013). This is the same treatment as the IMF's FCL.

Objectives

BSLs can carry several different economic, financial and geopolitical objectives:[16]

Bank for Reconstruction and Development has signed swap lines with Georgia, Ukraine, and Azerbaijan.

[15] As noted earlier in footnote 2, this paper defines a BSL as a currency swap between two central banks (or, in some cases between a central and finance ministry). Multilateral institutions have also extended currency swap lines to their member countries. For example, since the onset of the COVID-19 pandemic, the European Bank for Reconstruction and Development has signed swap lines with Georgia, Ukraine, and Azerbaijan.

[16] The stated objectives of BSLs can be described from both the recipient's perspective (e.g., addressing BoP needs), or in other cases, from the creditor's perspective (e.g., promoting internationalization of own currency). BSLs can therefore serve multiple objectives, which may differ between recipients and creditors, complicating their classification.

- *Easing pressure on currency funding markets.* In the case of the Fed's BSLs, they aim at mainly supporting private financial institutions of counterpart countries by easing pressures in U.S. dollar funding markets, and the Fed's counterpart central banks provide the U.S. dollar to domestic financial institutions through auctions. The ECB's BSLs with non-Eurozone countries have a similar function. Japan's BSLs with China and other Asian EMs intend to secure local currency liquidity for Japanese financial institutions that operate in counterpart countries.

- *Mitigating BOP needs.* Some BSLs are intended to meet or alleviate BOP needs of a recipient country. Japan's BSLs with Asian EMs partly aim at serving this objective. Some Chinese BSLs also appear to be aimed at addressing the recipient country's BOP needs, such as with Pakistan.

- *Promoting currency internationalization and facilitating trade.* The Chinese authorities have expressed multiple objectives for their expansion of BSLs: (i) promoting internationalization of the renminbi; (ii) facilitating international trade and investment; in addition to, (iii) the abovementioned ensuring financial market stability through provision of renminbi liquidity.[17]

Terms and conditions

BSLs are mostly provided in local currencies of counterpart central banks and some appear to price credit risks. In many cases, information on terms and conditions are limited and publicly unavailable.

- *Currency*. Most central banks provide their own currencies in exchange for the currency of counterparty central banks. One exception is the Japanese MoF's BSLs, which provide U.S. dollar-denominated BSLs to several Asian EMs in exchange for the counterpart's currency. Another example is a U.S. dollar-denominated BSL between India and the Maldives used during the COVID-19 pandemic.

- *Duration and maturity*. The Fed's BSLs with the five major central banks have been established on a standing basis since 2013. Many other BSLs have a 3-year duration and often are subject to rollover, although many of the BSLs involving China, Japan, and Korea have been renewed and established for an extended period. If swaps are rolled over repeatedly, their distinction with long-term loans becomes less obvious. The standard maturity for drawn BSLs is usually 90 days. The standard 90-day maturity for BSL facilities is justified by the concentrated FX swap market turnover in the below 3-month maturity segment as evidenced by Bank for International Settlements (2019).

- *Costs.* A few countries have disclosed the actual costs of their Chinese BSLs (the text table), although in many cases information on actual costs is publicly unavailable. Based

[17] See, e.g., the People's Bank of China's website: http://www.pbc.gov.cn/en/3688241/3688636/3688657/index.html

on these and anecdotal evidence, interest rates of Chinese BSLs appear to take account of credit risks of a recipient country. Chinese BSLs use the overnight Shanghai Interbank Offered Rate (SHIBOR) as the benchmark rate, with a spread determined by the recipient country's credit rating and other factors (IMF, 2015). The Fed published interest rates and maturities following operations (linked at U.S. Dollar Liquidity Swap - Operation Results). At end-2020, the interest rate under the Fed's swaps was around 0.3 percent.

Table. Costs under China's BSLs (examples)

Recipient country	Costs (basis points, above SHIBOR)	EMBIG spread (on the day when the BSL was signed)
Argentina	400 [1/]	646
Mongolia	200 [2/]	468
Turkey	200 [3/]	541

Sources: BCRA, BOM, CBRT, and Bloomberg Finance L.P.
[1/] From Banco Central de la República Argentina.
[2/] From Bank of Mongolia.
[3/] From Central Bank of the Republic of Turkey.

- *Data limitation.* Other than those BSLs between AEs, information on terms and conditions are limited because creditor or recipient countries do not announce drawing in many cases.

V. Empirical Analysis

A. Panel Data

For the regression analysis below, we construct unbalanced annual panel data for EM and developing economies during 2000–2019.[18] We do this by combining macroeconomic data and the authors' dataset of BSLs based on publicly available information.[19] The focus on EMs and developing economies fills a gap in existing studies, given that the effectiveness of BSLs among AEs has already been analyzed extensively (Bahaj and Reis, 2019, 2020; Rose and Spiegel, 2012). Although China is defined as an EM economy, it is excluded from the panel data given its predominant role as a provider (rather than a recipient) of BSLs. (See Table A3 for the summary statistics of key variables.)

In the panel data, we also identify the recipient country in each BSL. In a BSL, there is usually an implicit recipient and creditor country as discussed in the previous section. We

[18] The definition of emerging market and developing economies follows the IMF's definition.

[19] The sources of the macroeconomic data are IMF WEO, IFS, IMF Financial Flows Analytics, and Direction of Trade Statistics, and Bloomberg.

need to identify which of the two countries is a recipient country to address many of the empirical questions below. For example, testing whether a BSL is effective at stabilizing financial markets requires us to identify the recipient country because usually the recipient country can benefit from the BSL. We define a country (either an EM or developing economy) as the recipient country of a BSL if China or an AE is the counterpart of the BSL.

B. Regression Analysis using Annual Data

Using the panel data on EM and developing economies over the period 2000–2019 introduced in the previous subsection, this section investigates several aspects of BSLs, including their motivations and effectiveness from the perspective of BSL recipient countries. The analysis suggests that:

- Recipient countries are more likely to sign and roll over a BSL designed to alleviate BOP needs (i.e., not just to ease funding pressures) when their external position becomes weaker, though the estimated quantitative impact is at most modest.

- A country may be more likely to sign a BSL with China when its exports to China have increased.

- Overall, the impact of BSLs in general on financial stability is not clear, through Fed BSLs appear to have been effective at maintain market stability during the COVID-19 pandemic.

The results in this section, however, should be interpreted with caution, given the limitations of the empirical analysis below. First, even though the analysis controls for key macroeconomic fundamentals, the results may still be affected by the problems of omitted variables (e.g., country and year-specific sentiment) and collinearity among variables. Relatedly, the annual data we use does not allow us to fully control for developments within the year, and in principle, the analysis using higher frequency data is also subject to the same limitation. In addition, when we have as a regressor a dummy variable indicating that the country signs a BSL, we cannot exclude the possibility that the results may be affected by endogeneity bias. For example, anticipated changes in the recipient country's spreads may have influence on the creditor country's decision to sign a BSL.

What are the motivations behind BSLs?

Countries seek BSLs for a variety of reasons. As discussed above, a creditor country may want to provide a BSL to facilitate trade or internationalize its own currency, while a recipient country may seek a BSL as a financial safety net, particularly if its external position is weak.

To analyze *recipient-side* motivations behind BSLs, we estimate the following panel equation with the fixed effects (FE) model.

$$D\_BSL\_sign_{i,t} = \beta_0 + \beta_1 D\_BSL\_end_{i,t} + \beta_2 Z_{i,t-1} + \varepsilon_{i,t}$$

- $D\_BSL\_sign_{i,t}$ is a dummy variable indicating that country *i* signs a BSL (either a first agreement or rollover) in year *t*. *This BSL dummy equals 1 only when country* i *is seen as the recipient country in the BSL*, while the dummy equals 0 for the creditor country.

- $D\_BSL\_end_{i,t}$ is the dummy of whether for recipient country *i* the existing BSL expires in year *t*. The coefficient on this dummy is positive if the motivation for a rollover is strong.

- $Z_{i,t-1}$ consists of lagged external and domestic variables:

  - ✓ External vulnerability variables consist of external debt (in percent of GDP), current account balance (in percent of GDP), gross foreign reserves (months of imports), and annual percentage change of the exchange rate (U.S. dollar against local currency).

  - ✓ Domestic variables include real GDP growth (percent), CPI inflation rate (percent at end of period), and fiscal primary balance (in percent of GDP), and real GDP per capita (PPP, current international $).[20]

  - ✓ Openness variables consist of net capital inflows (in percent of GDP) and the sum of exports and imports of goods and services (in percent of GDP)—and IMF net lending (in percent of GDP).

Key findings using this specification summarized as follows (first column of Table 3a).

- **Once a country has signed a BSL, it is likely to renew the BSL at the point of expiration or sign a new BSL.** $D\_BSL\_end_{i,t}$—a dummy indicating that the preceding BSL is expiring in year *t*—is highly significant. The coefficient implies that if the existing BSL is expiring in year *t*, the likelihood of signing a BSL (either a rollover or a new BSL) in the same year is about 40-50 percent higher than if it did not have a BSL in

[20] Real GDP per capita is included to capture the impact of a country's stage of development.

the first place. For the recipient country, this could reflect: (i) a perceived or actual ongoing need/desire for liquidity support; (ii) the relative ease of renewing existing BSLs, given the established bilateral relationship with creditor countries; and (iii) a greater comfort in pursuing new BSLs, having had previous experience with BSLs.

- **When the external position weakens, in particular with higher external debt, a country is more likely to sign a BSL.** The coefficient on the external debt is statistically significant, although the size of the coefficient is at most modest. The coefficient implies that an increase in external debt/GDP by 10 percentage points raises the probability of signing a BSL by 0.2–0.3 percent. The current account balance and gross foreign reserves exhibit expected negative correlations but their coefficients are not statistically significant. One might argue that the significant coefficient on the external debt (first column of Table 3a) may simply reflect the country's incentive to roll over an existing BSL because external debt may include debt that resulted from the existing BSL. However, this may not be the case because after controlling for the total size of the existing BSL(s) (in percent of GDP) in year *t*–1, external debt still has a significant coefficient (second column of Table 3a).

- **Other variables.** Most of the coefficients on the domestic variables are not statistically significant. Regarding the openness variables, net capital inflows have an insignificant coefficient, while the coefficient on the sum of exports and imports is significantly negative.[21] Finally, IMF net lending (in percent of GDP) has a negative, but insignificant coefficient.

Regression analysis confirms that a country with low international reserves is more likely to *roll over* its BSL. The interaction between $D\_BSL\_end_{i,t}$ (the dummy indicating that the preceding BSL is expiring in year *t*) and the dummy of high external debt (above 50 percent of GDP) is expected to capture the motivation of a rollover when external debt is high. The coefficient on this interaction term is negative—contrary to expectations—though not significant (third column of Table 3a). The results are similar if $D\_BSL\_end_{i,t}$ is interacted with the dummy of a weak current account balance (under –3 percent of GDP) (fourth column of Table 3a). The dummy $D\_BSL\_end_{i,t}$ interacted with the dummy of low foreign reserves (less than 5 months of imports) gives a positive and significant coefficient (fifth column of Table 3a).

In a horse-race regression with these three interaction dummies, the coefficient on the last interaction dummy (low foreign reserves) remains positive and its statistical significance is the highest (first column of Table 3b). However, the results should be

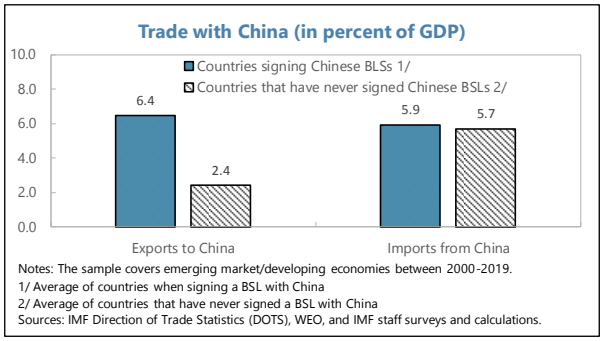
[21] The net capital inflows are net capital inflows by nonresidents minus net capital outflows by residents. If we use the latter two variables instead of the net capital inflows and include the two variables of exports and imports instead of their sum, only the exports have a statistically significant (negative) coefficient and the other three variables (net capital inflows by nonresidents, net capital outflows by residents, and imports) have statistically insignificant coefficients. In this specification, the coefficients on the rest of the variables are similar to those reported earlier.

interpreted with caution because high collinearity exists among the three variables. The FE logit model gives similar results (second column of Table 3b).

The results so far may be driven by BSLs designed to alleviate BOP needs. The Fed and ECB BSLs target an easing of funding pressures (rather than addressing BOP needs), and some BSLs extended by the BoJ have a similar objective. If we exclude these BSLs from the sample, the results are similar to those discussed earlier (third column of Table 3b)**.**

Focusing on Chinese BSLs, which constitute the majority of BSLs, also gives similar results. The fourth and fifth columns of Table 3b present the results when using the dummy of signing a BSL with China as the dependent variable.

Countries with higher exports to China (in percent of GDP) appear to be more likely to initiate a BSL with China (see the text figure). Formal regression using the FE model confirms these points (fourth column of Table 3b), though the coefficient on exports to China is slightly below the statistical significance level when using the FE logit model (last column of Table 3b). These results could be interpreted as supporting the argument that Chinese BSLs have often been used by China to cement its economic relationship with partner countries, particularly exporters of natural resources. The same pattern is not observed with respect to imports from China.



Notes: The sample covers emerging market/developing economies between 2000-2019.
1/ Average of countries when signing a BSL with China
2/ Average of countries that have never signed a BSL with China
Sources: IMF Direction of Trade Statistics (DOTS), WEO, and IMF staff surveys and calculations.

Table 3a. Motivations behind BSLs

	(1) Fixed effects D_BSL_sign	(2) Fixed effects D_BSL_sign	(3) Fixed effects D_BSL_sign	(4) Fixed effects D_BSL_sign	(5) Fixed effects D_BSL_sign
Independent variables					
D_BSL_end	0.4327***	0.4447***	0.4757***	0.5040***	0.3475***
	(0.0710)	(0.0732)	(0.1068)	(0.0772)	(0.0910)
D_ChinaBSL_end					
Lag of size of BSL(s) (% of GDP)		-0.0061	-0.0057	-0.0058	-0.0070
		(0.0065)	(0.0063)	(0.0064)	(0.0068)
External vulnerability variables					
Lag of external debt (% of GDP)	0.0002**	0.0002**	0.0002**	0.0003**	0.0002**
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lag of current account balance (% of GDP)	-0.0005*	-0.0005*	-0.0005*	-0.0005*	-0.0005*
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Lag of gross foreign reserves (in months of imports)	-0.0008	-0.0008	-0.0009	-0.0008	-0.0005
	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)
Lag of annual percentage change of the nominal exchange rate (US dollar/local currency)	0.0001	0.0001	0.0000	0.0000	0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Domestic variables					
Lag of real GDP growth (percent)	0.0003	0.0004	0.0004	0.0004	0.0003
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Lag of CPI inflation rate (percent, end of period)	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0002)
Lag of fiscal primary balance (% of GDP)	0.0003	0.0004	0.0004	0.0003	0.0004
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)
Lag of real GDP per capita (ppp)	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Openness variables					
Lag of net capital inflows (% of GDP)	-0.0004	-0.0003	-0.0003	-0.0004	-0.0003
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Lag of sum of exports and imports of goods & services (% of GDP)	-0.0007**	-0.0007**	-0.0007**	-0.0007**	-0.0008**
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Lag of IMF net lending (% of GDP)	-0.0032	-0.0032	-0.0032	-0.0033	-0.0028
	(0.0025)	(0.0025)	(0.0024)	(0.0026)	(0.0022)
D_BSL_end interacted with dum of high external debt			-0.0629		
			(0.1476)		
D_BSL_end interacted with dum of weak current account balance				-0.2047	
				(0.1674)	
D_BSL_end interacted with dum of low gross foreign reserves					0.2686*
					(0.1422)
Const.	-0.0215	-0.0214	-0.0232	-0.0278	-0.0182
	(0.0313)	(0.0328)	(0.0333)	(0.0332)	(0.0339)
Year dummies	YES	YES	YES	YES	YES
Sample	EM+Dev.	EM+Dev.	EM+Dev.	EM+Dev.	EM+Dev.
Number of countries	132	132	132	132	132
Observations	2,271	2,271	2,271	2,271	2,271
R-squared	0.1883	0.1895	0.1902	0.1958	0.2017

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Notes: The sample is emerging and developing countries, excluding China (as China is not seen as a recipient country in a BSL with an emerging/developing country).

Table 3b. Motivations behind BSLs

	(1) Fixed effects D_BSL_sign	(2) Fixed effects logit D_BSL_sign	(3) Fixed effects logit D_BSL_sign Exc. Fed, ECB, BoJ	(4) Fixed effects D_ChinaBSL_sign	(5) Fixed effects logit D_ChinaBSL_sign
Independent variables					
D_BSL_end	0.4467***	2.4634***			
	(0.1197)	(0.7048)			
D_ChinaBSL_end				0.4987***	3.3012***
				(0.1905)	(1.0512)
Lag of size of BSL(s) (% of GDP)	-0.0060	-0.6462***	-0.6502***	-0.0166***	-1.1961***
	(0.0065)	(0.1528)	(0.1552)	(0.0058)	(0.2478)
Lag of imports from China (% of GDP)				-0.0000	0.1165
				(0.0003)	(0.1713)
Lag of exports to China (% of GDP)				0.0031**	0.2540
				(0.0013)	(0.1731)
External vulnerability variables					
Lag of external debt (% of GDP)	0.0002**	0.0380***	0.0370***	0.0003***	0.0776***
	(0.0001)	(0.0137)	(0.0139)	(0.0001)	(0.0199)
Lag of current account balance (% of GDP)	-0.0005*	-0.1766**	-0.2121**	-0.0005*	-0.1515
	(0.0003)	(0.0855)	(0.0907)	(0.0002)	(0.1131)
Lag of gross foreign reserves (in months of imports)	-0.0004	-0.0483	0.0637	-0.0010	-0.0501
	(0.0014)	(0.1489)	(0.1626)	(0.0012)	(0.2241)
Lag of annual percentage change of the nominal exchange rate (US dollar/local currency)	0.0000	-0.0315	-0.0263	0.0000	-0.0341
	(0.0001)	(0.0318)	(0.0319)	(0.0001)	(0.0412)
Domestic variables					
Lag of real GDP growth (percent)	0.0004	0.1333	0.1442	-0.0001	0.2645*
	(0.0007)	(0.0969)	(0.1005)	(0.0005)	(0.1373)
Lag of CPI inflation rate (percent, end of period)	-0.0002	-0.0584	-0.0419	-0.0002	-0.0819
	(0.0002)	(0.0601)	(0.0567)	(0.0002)	(0.0829)
Lag of fiscal primary balance (% of GDP)	0.0003	-0.0265	-0.0410	0.0004	-0.1005
	(0.0004)	(0.0907)	(0.0938)	(0.0003)	(0.1169)
Lag of real GDP per capita (ppp)	0.0000***	-0.0000	-0.0001	0.0000***	0.0002
	(0.0000)	(0.0002)	(0.0002)	(0.0000)	(0.0003)
Openness variables					
Lag of net capital inflows (% of GDP)	-0.0003	-0.1149	-0.1406*	-0.0003	-0.1859*
	(0.0002)	(0.0726)	(0.0766)	(0.0002)	(0.0954)
Lag of sum of exports and imports of goods & services (% of GDP)	-0.0008**	-0.0966***	-0.0866***	-0.0007***	-0.1019**
	(0.0003)	(0.0296)	(0.0305)	(0.0003)	(0.0443)
Lag of IMF net lending (% of GDP)	-0.0028	-0.1545	-0.1243	-0.0032	-0.4895
	(0.0022)	(0.2954)	(0.2923)	(0.0024)	(0.3583)
D_BSL_end interacted with dum of high external debt	-0.1585	-2.2544*	-2.0942*	-0.0489	-1.8237
	(0.1440)	(1.1672)	(1.1802)	(0.2235)	(1.5200)
D_BSL_end interacted with dum of weak current account balance	-0.1452	-0.9821	-0.9492	-0.1994	-1.7598
	(0.1580)	(1.1051)	(1.1592)	(0.2067)	(1.3578)
D_BSL_end interacted with dum of low gross foreign reserves	0.3267**	3.5523***	3.6404***	0.2757	3.3993**
	(0.1535)	(1.3261)	(1.3635)	(0.2200)	(1.6752)
Const.	-0.0265			-0.0397	
	(0.0348)			(0.0294)	
Year dummies	YES	YES	YES	YES	YES
Sample	EM+Dev.	EM+Dev.	EM+Dev.	EM+Dev.	EM+Dev.
Number of countries	132	28	27	131	24
Observations	2,271	516	497	2,216	436
R-squared	0.2106			0.2452	

Robust standard errors in parentheses (standard errors for the 2nd, 3rd, and 4th columns)
*** p<0.01, ** p<0.05, * p<0.1
Notes: The sample is emerging and developing countries, excluding China (as China is not seen as a recipient country in a BSL with an emerging/developing country).

Are BSLs effective at stabilizing financial conditions?

To examine if BSLs contribute to stabilizing financial conditions, we estimate the following equation:

$$EMBI_{i,t} = \beta_0 + \beta_1 D\_BSL\_sign_{i,t} + \beta_2 EMBI_{i,t-1} + \beta_3 Z_{i,t-1} + \varepsilon_{i,t},$$

where

- $EMBI_{i,t}$ is the Emerging Market Bond Index (EMBI) spreads of country *i* at end-year *t* (basis points).
- $D\_BSL\_sign_{i,t}$ equals 1 if country *i* signed a BSL in year *t* (as before)
- $Z_{i,t-1}$ consists of external vulnerability and domestic variables.

BSLs have no statistically significant impact on risk premia, captured by EMBI or Credit Default Swap (CDS) spreads. While the EMBI spread measures the spread of U.S. dollar-denominated government bond yields over the corresponding U.S. Treasury yield, the CDS spread indicates the probability of default on a given horizon on the country's foreign currency-denominated sovereign debt. In theory, provision of BSLs could stabilize financial markets and reduce these spreads by limiting short-term foreign exchange funding vulnerabilities. The simple FE regression results indicate that if a country signs a BSL in the current year, that could lower EMBI spreads by 66 basis points but the estimate is not significant (first column of Table 4). The results could be biased when using the FE to estimate the dynamic panel model (which includes the lagged dependent variable $EMBI_{i,t-1}$ as an independent variable). Using the system GMM dynamic estimator (Blundell and Bond, 1998) could control for this bias, but doing so gives similar results (second column of table 4). Using CDS spreads (5-year maturity) instead of EMBI spreads gives similarly muted results. The impact of BSLs on CDS spreads is also estimated to be not statistically significant (last two columns of Table 4).

Table 4. Impact of BSLs on EMBI and CDS spreads

	(1) Fiexed Effects	(2) System GMM	(3) Fiexed Effects	(4) System GMM
	EMBI (end year)	EMBI (end year)	CDS (end year)	CDS (end year)
Variables				
D_BSL_sign	-66.14	-59.00	-37.49	15.32
	(58.42)	(71.78)	(27.36)	(59.26)
Lag of EMBI spreads (bps, end of year)	0.44***	0.68***		
	(0.08)	(0.04)		
Lag of CDS spreads (bps, end of year)			0.09*	0.62***
			(0.05)	(0.08)
External vulnerability variables				
External debt (% of GDP)	6.03***	1.64	3.52**	2.11
	(2.15)	(1.21)	(1.42)	(1.43)
Current account balance (% of GDP)	-2.08	0.15	3.57	3.06
	(4.28)	(4.80)	(2.83)	(6.67)
Gross foreign reserves (in months of imports)	-10.51	5.71	-22.83**	-18.45
	(6.44)	(14.41)	(9.30)	(20.44)
Annual percentage change of the nominal exchange rate	1.63	-1.00	-1.83	-4.72
(US dollar/local currency)	(1.77)	(2.13)	(1.76)	(3.71)
Domestic variables				
Real GDP growth (percent)	-17.10**	-16.42*	-12.95*	12.15
	(7.47)	(8.83)	(7.34)	(10.57)
CPI inflation rate (percent, end of period)	2.87***	2.92***	0.00	1.21*
	(0.53)	(0.47)	(0.17)	(0.68)
Fiscal primary balance (% of GDP)	-12.20*	-6.85	-6.55*	1.77
	(6.29)	(9.71)	(3.48)	(15.36)
Gross public debt (% of GDP)	0.75	0.66	-1.43	1.67
	(2.18)	(1.22)	(1.72)	(1.32)
Const.	-109.22	120.38	210.85	-63.25
	(123.63)	(110.92)	(152.40)	(174.46)
Year dummies	YES	YES	YES	YES
Sample	conts. with EMBI data	conts. with EMBI data	conts. with CDS data	conts. with CDS data
Number of countries	63	63	45	45
Observations	788	761	536	530
R-squared	0.52		0.33	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is emerging and developing countries, excluding China (as China is not seen as a recipient country in a BSL with an emerging/developing country). In the second and fourth columns, GMM instruments are 3-year and 4-year lags of the dependent variable, and 2-year and 3-year lags of the dummy of signing a BSL and the rest of macroeconomic variables (i.e., 1-year and 2-year lags of the rest of the independent variables, other than EMBI and CDS variables and year dummies).

Do BSLs promote sound macroeconomic policies?

A desirable goal of the GFSN could be to support a strengthening of external buffers and promote sound macroeconomic policies. While BSLs help build up external buffers upon drawing, a question arises as to whether BSLs also promote sound macroeconomic policies. Finding a good proxy for sound macroeconomic policies is difficult, particularly given the data limitations. In this context, we address this question by estimating the following equation with the current account balance as the dependent variable, given the fact that some BSLs are designed to alleviate BOP needs:

$$CA\ balance_{\ i,t} = \beta_0 + \beta_1 D\_BSL\_sign_{i,t-1} + \beta_2 CA\ balance_{i,t-1} + \beta_3 Z_{i,t-1} + \varepsilon_{i,t}$$

The results provide little evidence that BSLs promote sound macroeconomic policies. The coefficient on $D\_BSL\_sign_{i,t-1}$ (dummy indicating that the country signed a BSL in year *t*–1), estimated using the system GMM dynamic estimator, is positive but not significant (first column of Table 5).[22] Using the 2-year lag ($D\_BSL\_sign_{i,t-2}$) and gives a larger coefficient, but it remains not statistically significant (second column). Nevertheless, as noted above, we recognize that the current account balance may not always be a good proxy for sound macroeconomic policies.

Table 5. Impact of BSLs on current account balance

	(1) System GMM CurrentAccount_GDP	(2) System GMM CurrentAccount_GDP
Variables		
Lag of D_BSL_signed	0.59	
	(0.96)	
2-year lag of D_BSL_signed		0.72
		(0.96)
Lag of current account balance (% of GDP)	0.81***	
	(0.02)	
2-year lag of current account balance (% of GDP)		0.62***
		(0.04)
Year dummies	YES	YES
Sample	EM+Dev.	EM+Dev.
Number of countries	132	131
Observations	2,136	2,003

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is emerging and developing countries, excluding China (as China is not seen as a recipient country in a BSL with an emerging/developing country). Controls not reported in the table: lag of annual percentage change of the nominal exchange rate; lag of real GDP growth (percent); lag of CPI inflation rate (percent, end of period); and lag of fiscal primary balance (% of GDP). In the first column, GMM instruments are 3-year and 4-year lags of the current account balance, and 2-year and 3-year lags of the dummy of signing a BSL and the rest of macroeconomic variables (i.e., 1-year and 2-year lags of the rest of the independent variables, other than the current balance and year dummies). In the second column, 4-year and 5-year lags of the current account balance, and 3-year and 4-year lags of the dummy of signing a BSL are used as GMM instruments, while the rest of the GMM instruments are the same as in the first column.

[22] Lagged values are used in the main specification instead of current values assuming that it may take time for a BSL to have an impact on policies. Using current values also gives a positive but insignificant coefficient (details not reported here).

How are BSLs and IMF financial arrangements related?

We test whether the existence of a BSL could either delay or facilitate a country's request for an IMF financial arrangement. If the former effect is dominant, we would observe a *negative* correlation between the existence of a BSL and initiation of an IMF financial arrangement. If the latter effect is more important, which is also possible because a BSL is often a key component of the overall financing package coordinated by the IMF (see the text table), we would see a *positive* correlation.

Table. Examples of IMF-BSL Collaboration 1/

	IMF arrangement		Counterpart of
	Facility	Period	BSL
Argentina	SBA	2018 - 2020	China
Egypt	EFF	2016 - 2019	China
Mongolia	EFF	2017 - 2020	China
Pakistan	EFF	2019 - 2022	China

1/ Examples of cases where BSL is incorporated in the financing package coordinated by the IMF

To examine the relationship between BSLs and IMF financial arrangements, we estimate the following model:

$$D\_IMF_{i,t} = \beta_0 + \beta_1 D\_IMF\_end_{i,t} + \beta_2 D\_BSL\_sign_{i,t} + \beta_3 Z_{i,t-1} + \varepsilon_{i,t},$$

where $D\_IMF_{i,t}$ equals 1 if country *i* signs a new IMF financial arrangement in year *t*, $D\_IMF\_end_{i,t}$ equals 1 if an existing IMF financial arrangement ends in year *t*. As before, $D\_BSL\_sign_{i,t}$ equals 1 if country *i* signs a BSL in year *t*, and $Z_{i,t-1}$ is a vector of control variables.

The existence of a BSL and initiation of an IMF financial arrangement are positively correlated but the correlation is not statistically significant. The coefficient on $D\_BSL\_sign_{i,t}$ is positive but not statistically significant (first column of Table 6). Using its lag ($D\_BSL\_sign_{i,t-1}$) gives similar results (second column).

Table 6. BSLs and IMF financial arrangements

	(1)	(2)
	Fixed effects	Fixed effects
	D_IMF_sign	D_IMF_sign
VARIABLES		
D_IMF_end	0.20***	0.20***
	(0.04)	(0.04)
D_BSL_sign	0.03	
	(0.04)	
Lag of D_BSL_sign		0.05
		(0.05)
Year dummies	YES	YES
Sample	EM+Dev.	EM+Dev.
Number of countries	132	132
Observations	2,222	2,222
R-squared	0.07	0.07

Robust standard errors in parentheses

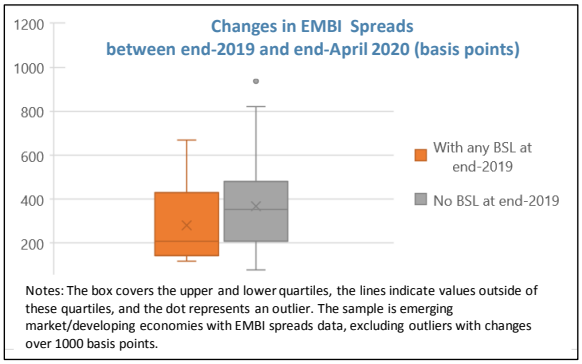
*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is emerging and developing countries, excluding China (as China is not seen as a recipient country in a BSL with an emerging/developing country). Controls not reported in the table are external and domestic vulnerability variables defined earlier.

C. Analyzing the Impact of BSLs After the Onset of the COVID-19 Pandemic

Using high frequency indicators and the 2019 panel data (above) allows us to conduct cross-section analysis *after* the onset of the COVID-19 pandemic. Given the still-limited data released since the onset of the COVID-19 pandemic (at the time of writing this paper), the analysis focuses on the impact of BSLs on risk premia. The regression results indicate that countries with BSLs appear to have experienced lower hikes in risk premia since the onset of the crisis, and the estimated impact of the Fed's BSLs appears to be stronger than that of BSLs in general.

Have BSLs been effective at stabilizing financial conditions since the onset of the COVID-19 pandemic?



Hikes in EMBI spreads at the height of the financial strain (April 2020) caused by the COVID-19 pandemic appear to have been contained for countries that entered the COVID-19 pandemic with BSLs (see the text figure). To test this point more formally, we run the following *cross-section* regression using the sample of EM and developing economies:

$$EMBI_{i,2020} = \beta_0 + \beta_1 D\_BSL_{i,2019} + \beta_2 EMBI_{i,end-2019} + \beta_3 Z_{i,2019} + \varepsilon_i,$$

where

- $EMBI_{i,2020}$ is the EMBI spreads after the onset of COVID-19 (basis points). As indicated below, we measure the EMBI spreads at the end of April 2020.
- $D\_BSL_{i,2019}$ is a dummy indicating that country *i* had a BSL at end-2019.
- $Z_{i,2019}$ consists of external and domestic variables (defined earlier) in 2019.

Regression analysis indicates that the coefficient of $D\_BSL_{i,2019}$ is consistently negative but not statistically significant in most cases. The first column of Table 7 reports that using $EMBI_{i,2020}$ measured at end-April 2020 (height of the financial strain) gives a negative but not statistically significant coefficient on the BSL dummy. With $EMBI_{i,end-2019}$ as a control, most of the macroeconomic variables are insignificant, which may reflect the fact that the former variable captures macroeconomic fundamentals. Indeed, once $EMBI_{i,end-2019}$ is excluded, the coefficients on some of the macroeconomic variables turn significant with expected signs (details not reported here). Using the *change* in the EMBI spreads since the end-2019 as the dependent variable gives a larger negative coefficient on the BSL dummy but the coefficient does not turn significant (second column of Table 7). When the *level* of CDS spreads (5-year maturity) at end-April 2020 period is used, the coefficient on the BSL dummy is negative but not significant (third column of Table 7). When using the change in

CDS spreads between end-2019 and end-April 2020, the coefficient on the BSL dummy turns significant (last column of Table 7).

Table 7. Impact of BSLs on EMBI and CDS spreads

	(1) OLS Level of EMBI (end-Apr)	(2) OLS Change of EMBI (end-Apr) since end-2019	(3) OLS Level of CDS (end-Apr)	(4) OLS Change of CDS (end-Apr) since end-2019
Independent variables				
Dummy of any BSL at end-2019	-79.72	-177.37	-117.48	-197.95*
	(117.58)	(145.25)	(83.39)	(97.68)
Lag of EMBI spreads (bps, end 2019)	2.81***			
	(0.36)			
Lag of CDS spreads (bps, end 2019)			2.86***	
			(0.33)	
External vulnerability variables				
External debt (% of GDP)	-1.16	-0.74	-0.87	-1.83
	(2.35)	(3.47)	(0.98)	(1.09)
Current account balance (% of GDP)	1.80	-11.51	15.53	7.29
	(11.60)	(17.62)	(13.21)	(14.04)
Gross foreign reserves (in months of imports)	-7.97	-29.98	0.10	-14.65
	(21.82)	(32.97)	(7.32)	(9.57)
Annual percentage change of the nominal exchange rate (US dollar/local currency)	-7.17	13.83	-17.65	-11.74
	(11.29)	(18.86)	(16.03)	(16.56)
Domestic variables				
Real GDP growth (percent)	-32.05	-114.08*	10.76	-7.32
	(39.40)	(63.21)	(21.60)	(30.47)
CPI inflation rate (percent, end of period)	-28.07*	26.33**	-37.43**	-7.36
	(15.39)	(12.00)	(16.97)	(14.71)
Fiscal primary balance (% of GDP)	29.59*	12.13	23.58	27.33
	(15.11)	(22.47)	(21.84)	(25.73)
Gross public debt (% of GDP)	0.31	9.17**	2.96	4.91*
	(3.42)	(4.15)	(2.57)	(2.88)
Const.	232.05	575.09	11.22	349.11
	(483.02)	(682.04)	(193.89)	(253.91)
Observations	66	66	45	45
R-squared	0.85	0.40	0.72	0.30
Sample	EM and Dev. with EMBI data	EM and Dev. with EMBI data	EM and Dev. with CDS data	EM and Dev. with CDS data

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes. The sample is emerging and developing countries, excluding China (as China is not seen as a recipient country in a BSL with an emerging/developing country).

The Fed's BSLs appear to have a stronger impact on financial stability than BSLs in general. Using the sample of AEs, EM and developing countries excluding the six major central banks (USA, EU, UK, Japan, Switzerland, Canada) and the *level* of CDS spreads (5-year maturity) gives a negative coefficient on the dummy indicating that the country has access to the Fed's BSL, though the coefficient is not significant (first two columns of Table 8).[23] Using the *change* in CDS spreads between end-2019 and end-March 2020 (right after the Fed's BSLs were reintroduced), the coefficient on the Fed's BSL dummy is significant (third column of Table 8). Using the change between end-2019 and end-April 2020

[23] Only CDS spreads (5-year maturity) are used as data on EMBI spreads are not available for most of the AEs in the sample.

strengthens the statistical significance, giving a coefficient significant at the 5 percent level (last column of Table 8). This finding may reflect a higher credibility and signaling power of Fed BSLs for a recipient country's creditworthiness compared with the broader BSL sample. The results also complement Aizenman et al. (2021) who found that the Fed's BSLs with the five major central banks in AEs had announcement effects on financial variables. All these findings demonstrate the important role that BSLs can play in the GFSN, helping to maintain global financial stability, especially at times of severe market disruptions.

Table 8. Impact of Fed's BSL on CDS spreads

	(1) OLS Level of CDS (end-Mar)	(2) OLS Level of CDS (end-Apr)	(3) OLS Change of CDS (end-Mar) since end-2019	(4) OLS Change of CDS (end-Apr) since end-2019
Independent variables				
Dummy of FED BSL (excluding six advanced economies)	-100.71	-90.91	-249.23*	-275.02**
	(120.74)	(110.31)	(140.78)	(132.25)
Lag of CDS spreads (bps, end 2019)	2.55***	2.92***		
	(0.29)	(0.31)		
External vulnerability variables				
Current account balance (% of GDP)	7.96	8.33	-0.72	-2.43
	(12.00)	(10.60)	(12.06)	(11.24)
Gross foreign reserves (in months of imports)	4.31	5.21	-3.98	-5.07
	(5.01)	(5.06)	(5.11)	(5.00)
Annual percentage change of the nominal exchange rate	-14.54	-13.81	-8.79	-6.68
(US dollar/local currency)	(16.17)	(14.68)	(16.33)	(14.52)
Domestic variables				
Real GDP growth (percent)	8.39	7.54	-7.08	-11.64
	(17.19)	(16.51)	(21.65)	(22.61)
CPI inflation rate (percent, end of period)	-29.87	-36.79**	-5.92	-7.11
	(18.05)	(16.03)	(16.52)	(14.24)
Fiscal primary balance (% of GDP)	19.47	18.92	26.41	27.51
	(19.68)	(18.36)	(22.36)	(21.84)
Gross public debt (% of GDP)	3.24	3.18	5.35	5.78*
	(2.99)	(2.64)	(3.39)	(3.12)
Const.	-138.07	-139.40	35.48	75.73
	(174.37)	(152.38)	(172.82)	(153.80)
Observations	56	56	56	56
R-squared	0.65	0.72	0.26	0.28
Sample	All cont. exc. six advanced economies with CDS data	All cont. exc. six advanced economies with CDS data	All cont. exc. six advanced economies with CDS data	All cont. exc. six advanced economies with CDS data

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

VI. Potential Policy Implications

The findings in this paper could raise some implications for policymaking,[24] though the findings should be interpreted with caution given the limitation of the empirical analysis noted earlier:

- **While BSLs can be an important source of liquidity support, in some cases they might contribute to the prolonging of weak policies.** The empirical analysis above suggests that recipient countries are more likely to sign and roll over BSLs designed to alleviate BOP needs, if their external position has weakened (Tables 3a and 3b).[25] Further, there is little evidence that BSLs promote sound policies following their extension, which may not be surprising given that BSLs do not usually attach policy conditionality (Table 5).

- **Better integration of BSLs designed to alleviate BOP needs with potential IMF-supported programs could help strengthen the effectiveness of the GFSN**. BSLs and IMF financing have room to create positive synergies: BSLs could help fill short-term financing needs and support external financing, thus helping close a financing gap in an IMF-supported program, while IMF-supported programs help members address their BOP needs, by anchoring a recipient country's policies in conditionality, fostering investor confidence and catalyzing financing from other sources.

- **Better disclosure of information on BSLs could improve the transparency of the GFSN.** There is scope to improve transparency on the drawings and terms and conditions of BSLs, which could help markets better assess (potential) funding conditions or the international reserves of recipient countries. One way to improve transparency could be to present BSLs separately in the IMF's Data Template on International Reserves and Foreign Currency Liquidity.[26] Consideration could also be given to disclosing such information on drawings, particularly for liquidity support, with an appropriate lag to avoid adverse consequences during a crisis.

VII. Conclusions

This paper made contributions to the analysis of BSLs. First, this paper filled a BSL information gap. The paper constructed a comprehensive overview of BSLs over the past decade based on publicly available information.

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[24] These views belong to the authors and do not necessarily represent the views of the IMF.

[25] This statement is not applicable to BSLs that are not designed to address BOP needs (e.g., Fed's BSLs that aim to alleviate funding pressure in U.S. dollar funding markets).

[26] The IMF disseminates IMF member countries' data on international reserves and foreign currency liquidity using a common template: "Data Template on International Reserves and Foreign Currency Liquidity".

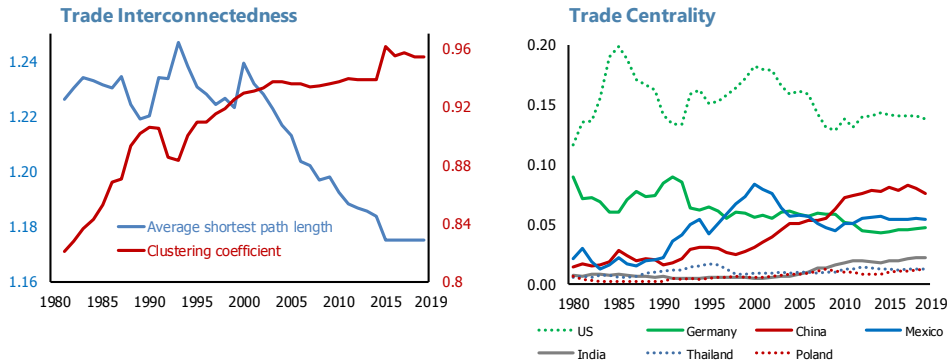
Second, the paper conducted regression analysis to address several empirical questions that were not explored in existing studies. The Fed BSLs appear to have been effective at stabilizing market conditions during the COVID-19 pandemic. Countries are more likely to sign a BSL with China if recipient countries have large export exposure to China. A recipient country of a BSL is more likely to sign and roll over a BSL designed to alleviate BOP needs when their external position becomes weaker. Nonetheless, given the limitations of the empirical analysis as discussed above, these findings should be interpreted with caution.

Continued work in the area of BSLs is needed. The landscape of BSLs continues to evolve with the signing of new BSLs. Improved BSL data is needed, including on terms and conditions, to allow further studies on their effectiveness, especially non-Fed, non-China BSLs. Future research could extend the scope of the analysis on emerging U.S. dollar liquidity instruments similar to BSLs, such as the central banks' repo facilities or U.S. dollar deposits provided to the central banks of EM or developing economies with a long-term maturity.

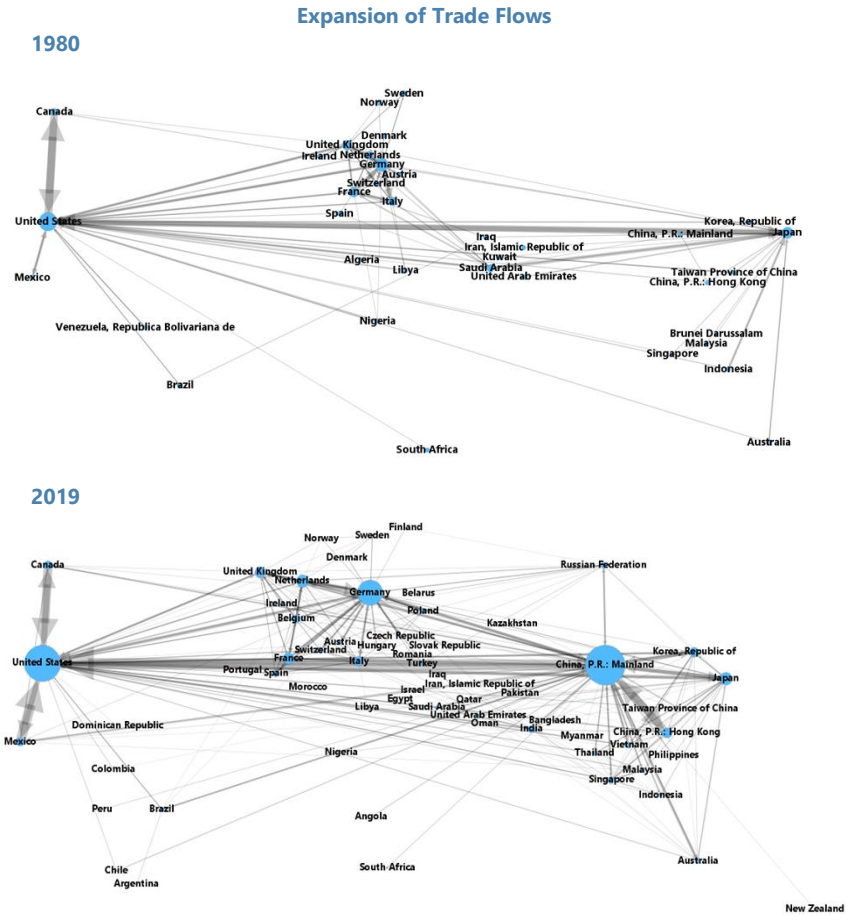
APPENDIX

A. Global Integration

Figure A1: Trade Integration

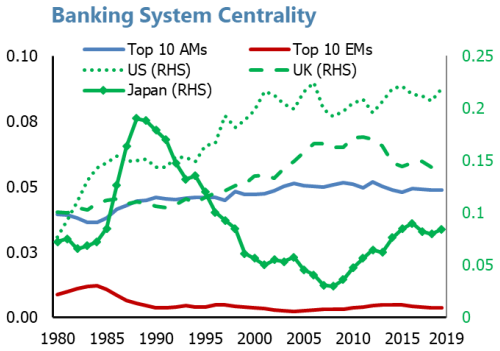


Notes: In the left chart, the **shortest path length** measures how many steps are needed to reach one country from another. A more connected network will have most countries directly connected with each other, with the shortest path length tending to 1; and the **clustering coefficient** measures the number of observed complete transitive relations (triplets of countries that are connected) divided by number of all ones, e.g., it measures the proportion of any country's partners who are partners amongst themselves.
In the right chart, a country's importance in the network is measured by its **eigenvector centrality**, normalized to sum to 1.

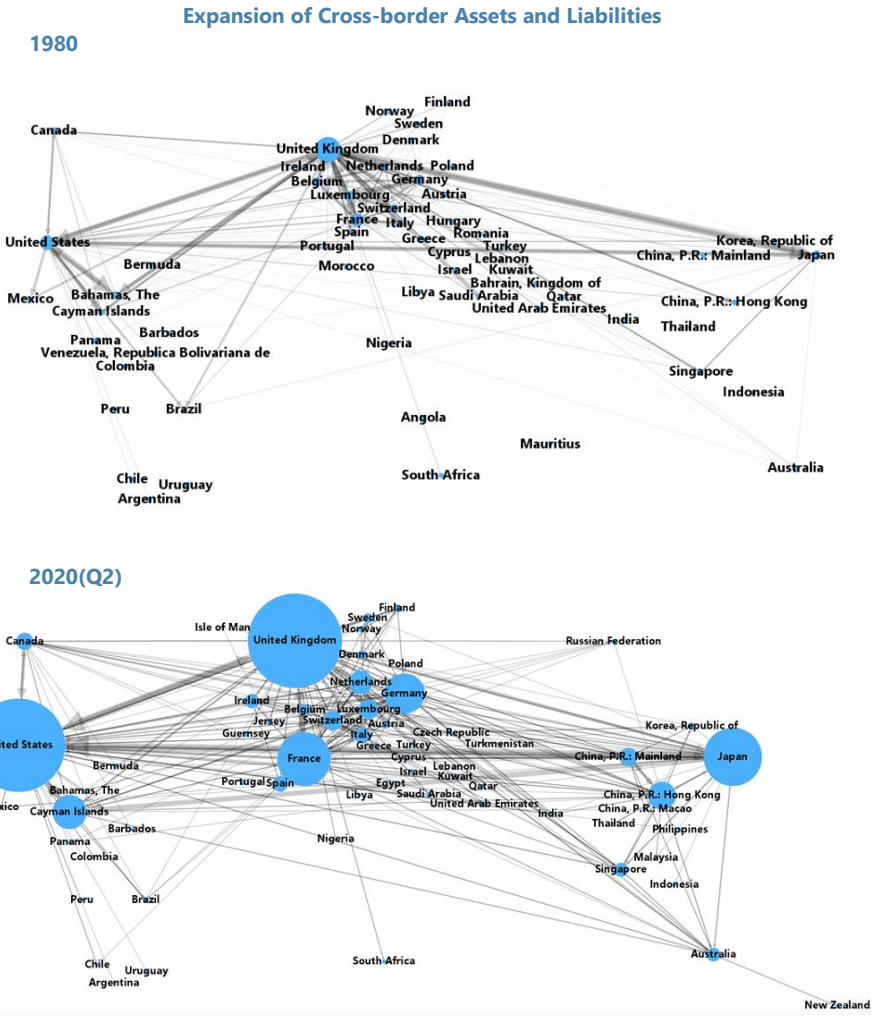


Notes: The **size of the links** is proportional to the U.S. dollar value of the real cross-border trade flows deflated by U.S. CPI, and the **size of the node** is proportional to the size of the country's exports and imports.
Sources: DOTS; Gephi; and IMF staff estimates.

Figure A2: Financial Integration



Notes: A country's importance in the network is measured by its **eigenvector centrality,** normalized to sum to 1.



Notes: The **size of the links** is proportional to the U.S. dollar value of the real cross-border BIS asset and liability positions deflated by U.S. CPI and the **size of the node** is proportional to the size of the country's bank cross-border assets and liabilities.

Sources: BIS; Gephi; and IMF staff estimates.

B. China's and Japan's BSLs

Table A1: China's BSLs (as of end-2020)

Counterpart	Signed date [1/]	Amount	
		In bil RMB	In bil US$ [2/]
Albania	Apr 2018	2	0.3
Argentina	Aug 2020	130	19.9
Australia	Mar 2018	200	30.6
Belarus	May 2018	7	1.1
Canada	Nov 2020	200	30.6
Chile [3/]	May 2018	50	7.7
Egypt	Feb 2020	18	2.8
Euro Area	Oct 2019	350	53.6
Hong Kong SAR, China	Nov 2020	500	76.5
Hungary [4/]	Dec 2019	60	9.2
Iceland	Oct 2020	3.5	0.5
Indonesia	Nov 2018	200	30.6
Japan	Oct 2018	200	30.6
Kazakhstan	May 2018	7	1.1
Korea	Oct 2020	400	61.2
Lao P.D.R.	May 2020	6	0.9
Macao SAR, China	Dec 2019	30	4.6
Malaysia	Aug 2018	180	27.5
Mongolia	Jul 2020	15	2.3
New Zealand	Aug 2020	25	3.8
Nigeria	Apr 2018	15	2.3
Pakistan [5/]	May 2018	30	4.6
Russia	Oct 2020	150	23.0
Singapore	May 2019	300	45.9
South Africa	Apr 2018	30	4.6
Suriname	Feb 2019	1	0.2
Switzerland	Jul 2020	150	23.0
Thailand	Dec 2020	70	10.7
Turkey [6/]	May 2019	12	1.8
United Kingdom	Oct 2018	350	53.6
Ukraine	Dec 2018	15	2.3
Total		3,707	567

1/ Latest signed date.

2/ Amounts calculated using the RMB/US$ rate at the end of 2020.

3/ The BSL was expanded to 50 billion yuan (RMB) from 22 billion yuan (RMB) in July 2020.

4/ The BSL was expanded to 60 billion yuan (RMB) from 20 billion yuan (RMB) in September 2020.

5/ The BSL was expanded to 30 billion yuan (RMB) from 20 billion yuan (RMB) in July 2020.

6/ The BSL was expanded to 35 billion yuan (RMB) from 12 billion yuan (RMB) in June 2021.

Sources: PBOC

Table A2. Japan's BSLs (as of end-2020)

Objectives	Counterpart	Japan's side	Signed date 1/
To address short-term liquidity difficulties and/or balance of payment difficulties; To prevent a crisis	India	MoF	Feb 2019
	Indonesia	MoF	Oct 2018
	Philippines	MoF	Oct 2020
	Thailand	MoF	July 2018
	Singapore	MoF	May 2018
	Malaysia	MoF	Sep 2020
To secure local currency liquidity for own financial institutions operating in the counterpart country and thereby ensuring financial stability	China	BoJ	Oct 2018
	Singapore	BoJ	Nov 2019
	Australia	BoJ	Mar 2019
	Thailand	BoJ	Mar 2020

1/ Signed date, or renewal date if renewed (or extended).

Sources: Japanese Ministry of Finance (MoF); and Bank of Japan (BoJ)

C. Summary Statistics

Table A3 summarizes the panel data over 2000–2019 used for the empirical analysis in the main text.

Table A3. Summary statistics of the full panel data

	Mean	Standard Deviation	# of obs
D_BSL_sign	0.03	0.18	2,271
External vulnerability variables			
External debt (% of GDP)	53.38	44.07	2,271
Current account balance (% of GDP)	-2.88	16.19	2,271
Gross foreign reserves (in months of imports)	5.35	4.50	2,271
Annual percentage change of the nominal exchange rate (US dollar/local currency)	-2.70	19.06	2,271
Domestic variables			
Real GDP growth (percent)	4.21	3.95	2,271
CPI inflation rate (percent, end of period)	6.94	14.98	2,271
Fiscal primary balance (% of GDP)	-0.48	6.06	2,271
Real GDP per capita (PPP, current international $)	10292.45	9743.90	2,271
Openness variables			
Net capital inflows (% of GDP)	3.15	16.46	2,271
Sum of exports and imports (% of GDP)	82.60	44.57	2,271
IMF net lending (% of GDP)	-0.0004	1.2643	2,271

Sources: IMF WEO, IFS, IMF Financial Flows Analytics, and Direction of Trade Statistics; Bloomberg; and IMF staff surveys and calculations.
Notes: The sample is emerging and developing countries, excluding China (as China is not seen as a recipient country in a BSL with an emerging/developing country). Means of variables are those of lagged variables used in the regression analysis (except for D_BSL_sign). D_BSL_sign is 1 if the country signs a BSL (either a first agreement or rollover) in the year. This dummy equals 1 only when the country is seen as the recipient country in the BSL, while the dummy equals 0 for the creditor. Defined a country as the recipient country of a BSL if the counterpart of the BSL is an advanced economy or China.

D. Additional Empirical Regressions

Do BSLs promote trade?

Regression analysis using the same panel data and the equation below indicates little evidence of the impact of BSLs on trade.

$$IM_{i,t} \text{ or } EX_{i,t} = \beta_0 + \beta_1 D\_BSL\_sign_{i,t-1} + \beta_2 IM_{i,t-1} + \beta_3 EX_{i,t-1} + \beta_4 Z_{i,t-1} + \varepsilon_{i,t},$$

where $IM_{i,t}$ and $EX_{i,t}$ are imports and exports of goods and services (in percent of GDP) of the BSL recipient country, respectively. Using the system GMM dynamic estimator, the impact of BSLs on imports of goods and services is estimated to be positive but not statistically significant (first column of Table A4). It might take time for the impact to emerge, but using the 2-year lag of the BSL dummy ($D\_BSL\_sign_{i,t-2}$) is also not significant (not reported here). The impact on exports is similarly weak (second column).[27]

Table A4. Impact of BSLs on trade

	(1) System GMM Imports of goods & services (% of GDP)	(2) System GMM Exports of goods & services (% of GDP)
Variables		
Lag of D_BSL_sign	0.39	0.15
	(1.28)	(1.04)
Lag of imports of goods & services (% of GDP)	0.93***	0.02
	(0.02)	(0.02)
Lag of exports of goods & services (% of GDP)	0.02	0.96***
	(0.03)	(0.02)
Lag of annual percentage change of the nominal exchange rate (US dollar/local currency)	-0.01	-0.01
	(0.01)	(0.01)
Lag of real GDP growth (percent)	0.03	0.05
	(0.08)	(0.05)
Lag of CPI inflation rate (percent, end of period)	-0.01	0.02**
	(0.01)	(0.01)
Lag of fiscal primary balance (% of GDP)	0.00	-0.02
	(0.05)	(0.03)
Const.	0.56	-0.69
	(0.94)	(0.83)
Year dummies	YES	YES
	EM+Dev.	EM+Dev.
Number of countries	132	132
Observations	2,136	2,136

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is emerging and developing countries, excluding China (as China is not seen as a recipient country in a BSL with an emerging/developing country). GMM instruments are 3-year and 4-year lags of imports and exports of goods and services, and 2-year and 3-year lags of the rest of macroeconomic variables (i.e., 1-year and 2-year lags of the rest of the independent variables, excluding the year dummies).

[27] The analysis did not identify a positive impact of BSLs on capital inflows (e.g., FDI inflows, portfolio inflows) either (details omitted here).

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