Do Institutional Distortions Matter?
IMF Moral Hazard and Excess Reserve Accumulation

Phillip Y. Lipscy
Haillie Lee[1]

[1] Phillip Y. Lipscy is Assistant Professor of Political Science at Stanford University and FSI Center Fellow at the Shorenstein Asia Pacific Research Center. Haillie Lee is a Ph.D. Student in the Department of Government at Georgetown University. We would like to thank participants at the 2010 International Political Economy Society Meeting for helpful feedback. We would also like to thank current and former officials of the IMF, Chinese government, Japanese Ministry of Finance, Japanese Ministry of Foreign Affairs, Taiwanese Ministry of the Economy, Taiwanese Ministry of Foreign Affairs, United States Department of State, United States Department of the Treasury, and World Bank who were exceedingly gracious with their time and resources. This research was made possible by the generous support of the Reischauer Institute of Japanese Studies, US-Japan Program, Weatherhead Center for International Affairs at Harvard University, and Sakurako and William Fisher.

Abstract

The International Monetary Fund (IMF) has been widely criticized for improperly reflecting economic realities. In particular, Japan, China, and other ASEAN+3 states have claimed that the institution both formally and informally underrepresents their rising economic status in the world economy. Does such underrepresentation have real economic consequences? We argue that the unbalanced structure of the IMF has created a *biased global insurance mechanism*, in which some countries are subject to excessive moral hazard, while others are forced to pursue aggressive self-insurance. Empirically, we show that countries with strong economic ties to the US and Europe have tended to: 1. Receive more generous IMF lending; 2. Hold less reserves; 3. More frequently experience currency crises. The pattern is generally reversed for countries with strong economic ties to Japan, which has been traditionally underrepresented in the IMF. Case study evidence also indicates that East Asian policymakers perceive the IMF to insufficiently take account of their interests, a factor that contributed to "excess" reserve accumulation since 1998. Such reserve accumulation may have played a role in pushing down borrowing costs in developed countries such as the United States, inflating asset price bubbles. We must therefore consider the possibility that political distortions in the IMF contributed in some measure to the global financial crisis of 2008.

"It is important to recognize that the current distribution of IMF quotas represents another form of unsustainable global imbalance."

-Toshihiko Fukui, Former Governor of the Bank of Japan

Over the past decade, global imbalances have become an increasingly salient political and economic issue. In particular, the fixed and undervalued exchange rates, reserve accumulation, and large current account surpluses of East Asian countries – coupled with a large US current account deficit – has become widely known as "Bretton Woods II," a new iteration of the post-World War II international monetary order (Dooley et al. 2003). The associated foreign demand for US treasury securities may have contributed to "Greenspan's Conundrum" – the stickiness of medium term interest rates in the United States in the mid-2000s despite increases in the Fed Funds Rate (Truman 2005; Bernanke et al. 2005; Roubini and Setser 2005). In turn, low medium-term interest rates in the United States kept a lid on mortgage interest rates, contributing to the housing bubble that triggered the financial crisis of 2008 (The Financial Crisis Inquiry Commission 2011).[2]

The rise and persistence of global imbalances remains something of a mystery. Most existing accounts of these global imbalances have been written by economists and focus on underlying economic factors.[3] The accumulation of international reserves by East Asian and other states appears excessive by most measures, and the reserves represent a perverse flow of

[2] Although there is general agreement that foreign purchases of US bond securities played a role in suppressing medium and long term interest rates during this period, the precise size of the effect is widely debated. For an overview of some estimates, see (Roubini and Setser 2005). For a summary of the potential causes of the decline in term premium, see (Bernanke 2006). During the mid-2000s policymakers frequently cited low interest rates as having a potentially simulative effect (Kohn 2005; Bernanke 2006), and there is some empirical evidence to support the claim that declines in bond term premiums are associated with a stimulus to economic activity (Rudebusch et al. 2007).

[3] E.g. a global savings glut (Bernanke 2005), distortions in domestic policies followed in the United States and abroad (Obstfeld and Rogoff 2009), a global shortage in reliable and tradable assets (Gourinchas et al. 2008), asymmetries in financial market depth (Mendoza et al. 2007).

capital from developing countries – where returns on invested capital ought to be higher – to developed states (Summers 2007; Gourinchas and Jeanne 2007). The reserve assets are largely invested in US treasury securities, which have near-zero real returns. The magnification of imbalances in the 2000s is also somewhat puzzling. Underlying factors, such as export-oriented development policies and savings rates differentials, have existed for many years before the previous decade.

In this paper, we will argue that greater attention needs to be paid to *international political imbalances.* Despite considerable shifts in the global balance of economic power over the past several decades, representation in the International Monetary Fund (IMF) across a wide range of measures – voting shares, personnel, and informal influence – has lagged behind. This has distorted the application of conditional lending by the IMF, resulting in harsh treatment of underrepresented states, such as those in East Asia, and lenient policies towards borrowers with close ties to overrepresented states. Consequently, moral hazard associated with IMF lending is unevenly distributed across the international system – "too big to fail" is a function not of economic size, but of political clout in the IMF. We argue that this disparity has led some countries and financial institutions to take unnecessary risks, while others have been forced to pursue self-insurance through the seemingly excessive accumulation of international reserves. In short, political distortion in the governance structure of the IMF has created a *biased global insurance mechanism*. This is an important problem in its own right, but it is also a probable contributor to global economic imbalances.

This paper will proceed as follows. In the following section, we will lay out our theory of biased insurance. To illustrate our theory, we will examine the involvement of East Asian states with the IMF. East Asian states have been chronically underrepresented in the IMF, and

the discouraging experience during the Asian Crisis of 1997-1998 convinced many regional leaders that future entanglement with the IMF must be avoided at all costs. Using both primary and secondary sources, we show that this perception of IMF distortion led to a policy of reserve accumulation as a means of self-insurance. We will draw particular contrasts with Mexico and Taiwan. Mexico entered its crisis in 1994 with close ties to the United States – an influential member of the IMF – and received fairly generous terms. Unlike East Asian states, Mexico continued to maintain a low level of reserves after 1994 and was the first country to turn to the IMF during the 2008 global financial crisis. Taiwan offers a useful counterfactual – despite sharing many characteristics with other East Asian states, such as an export-oriented development model and an undervalued exchange rate, Taiwan is not a member of the IMF and has therefore not been subject moral hazard associated with the institution. Compared to other East Asian states, Taiwan's reserves have been continuously maintained at a high level and exhibited very little response to the 1997-98 crisis, which suggests that concerns about the IMF, not regional factors or export policies, were the driving force behind reserve accumulation.

In order to provide a general test of our theory, we evaluate a panel dataset covering 130 countries during 1980-2010. Consistent with our theory, the statistical results show that countries with strong economic ties to powerful states within the IMF tend to underinsure by holding a lower levels of reserves and more frequently experience currency crises. Comparable economic ties to Japan, which has been historically underrepresented within the IMF, is not associated with such indicators of moral hazard. We will conclude the paper with a brief discussion and suggestions for future research.

The IMF as a Biased Insurance Mechanism

We propose a theory of biased insurance provision. In most domestic markets, insurance providers are prevented from overt discrimination based on arbitrary characteristics such as social status and race. Where discrimination occurs, it tends to be at the initial stages of entering into a contract, during which the insurer evaluates the feasibility of insurance and the appropriate premium based on known risk factors. It is therefore unusual for insurers to discriminate policyholders ex post, i.e. upon filing of an insurance claim, unless there is reason to suspect misrepresentation of material facts.

Similarly, a domestic lender of last resort, such as a central bank, has some regulatory capability to perform ex ante screening – banks that fail to meet risk criteria such as capital adequacy rules can be reprimanded or shut down. This capability is much more limited at the international level, where, under normal conditions, a lender of last resort such as the IMF has limited control over the economic policies of sovereign governments. Available tools tend to be limited to surveillance and consultation.

This puts a much greater onus on ex post discrimination for the IMF. When a country experiences balance of payments difficulties, the IMF must balance easy provision of rapid liquidity, which facilitates a resolution to the country's problems, and moral hazard concerns, the possibility that a bailout will incentivize future risky behavior. Hence, a decision by the IMF to lend, and on what terms, is a tricky decision involving considerable discretion on a case-by-case basis. Consequently, IMF lending decisions tend to be heavily politicized. Recent work in political science and economics has shed light on the politicization of IMF decision-making (Kahler 1993; Thacker 1999; Oatley and Yackee 2004; Dreher and Jensen 2007; Stone 2008;

Copelovitch 2008). Western nations, particularly the United States, exercise outsized influence over IMF decision-making, particularly over high-stakes issues (Stone, 2011). Since lending is often motivated by political, rather than technocratic or economic considerations, these distortions frequently produce perverse outcomes for borrowing states (Stone, 2002; Vreeland, 2003; Barro and Lee, 2005).

Our assertion is that these political distortions of IMF lending may have broader, systemic consequences for the international economy. One can think of the current structure of the IMF as essentially producing a *biased global insurance mechanism*. The politicization of IMF lending tends to follow a predictable pattern based on institutional features of the IMF. Hence, the IMF tends to discriminate against a certain set of country characteristics that have no relevance to the economic merits, much as a domestic employer might discriminate based on economically irrelevant characteristics such as gender, race, or sexual orientation. This pattern of discrimination has important consequences for policy decisions made by member states as well as the general operation of the global financial system.

What are the sources of bias in the IMF? The IMF is a relatively path dependent institution (Lipscy, 2011). Although the IMF has evolved considerably since its establishment in 1945, its decision-making structures, personnel, and informal norms have tended to lag behind economic realities. The institution tends to underrepresent, both in terms of formal voting rights and informal influence, countries that have experienced rapid relative economic growth. Hence, Japan was chronically underrepresented in the late 20th century, and rising economies such as China and India are underrepresented today.

Most studies have shown that the United States and developed Europe tend to dominate IMF decision-making. The United States exercises influence that goes well beyond its formal

voting rights – this has been attributed to the location of the IMF headquarters down the street from the US Treasury in Washington D.C., the education of most IMF economists at US institutions, and the fact that the US is the only country with a unilateral veto over important institutional decisions. Developed European countries also exercise considerable influence over IMF policies through their overweighted voting shares and representation on the Board of Directors, as well as the convention that the Managing Director of the Fund be a European national. East Asian countries, as well as most developing countries, enjoy no such advantages.

There has been considerable work on the potential for the IMF to produce moral hazard among member states and international lenders (Vaubel 1983; Frankel and Roubini 2002). This problem is particularly acute for countries that anticipate generous treatment from the IMF due to direct overrepresentation or strong political or economic ties to influential states within the institution. Equally problematic, and less frequently realized, is the distortion produced by *underreprentation* within the IMF – the perception that the IMF is nonresponsive to their concerns can curtail the incentives of financial institutions to engage in cross-border lending and lead countries towards aggressive accumulation of foreign reserves as a means of self-insurance. The uneven distribution of these incentives in the international system is normatively unfair – for example, putting East Asian financial institutions at an arbitrary disadvantage in their international lending activities – but is also a likely contributor to salient global imbalances.

In the following section, we will illustrate our theory by highlighting the experience of East Asia in recent years. East Asia is a useful case for several reasons: 1. It is an economically important region that is frequently cited as a major contributor to global imbalances; 2. East Asian underrepresentation in the IMF has been widely noted by academics and policymakers in the region; 3. From an empirical standpoint, the region offers an attractive "counterfactual" case

– Taiwan – which shares many features with its neighbors, such as an export-oriented development strategy and an undervalued exchange rate, but is not an IMF member for political reasons. We will follow this discussion of East Asia with a general quantitative test of our propositions using data covering a wider set of countries for the past three decades.

East Asia and the IMF

The policies undertaken by East Asian countries over the past two decades illustrate the plausibility of our theoretical argument. Formal underrepresentation in the IMF has been a major, lingering diplomatic concern of East Asian states. Quotas have been heavily tilted towards US and developed Europe, and attempts at reform have generally produced only modest adjustments. Prior to recent quota reforms, ASEAN+3 accounted for about 22% of world GDP in nominal terms and 27% in terms of PPP, but the region's share of IMF voting rights was only 13%, compared to 17% for the US and 30% for the European Union. ASEAN+3 also lags in informal measures of influence, such as representation of nationals among staff; ASEAN+3 has only a 7% share of IMF economists, compared to 24% for the US and 30% for the EU. The IMF managing directorship has gone to a European national by convention, and the location of the institution's headquarters in Washington D.C. gives US economic policymakers easy and immediate access to the institution. For all of these reasons, government officials in East Asia have held that the IMF does not appropriately reflect their preferences and economic standing in the world economy.

These concerns particularly came to a head during the 1997-1998 Asian Financial Crisis, when many regional policymakers felt that the IMF systematically ignored their views and imposed inappropriate policy measures preferred by the US and European states (Lipscy 2003; Lee 2006; Grimes 2008). Delays in IMF disbursement prompted nations with ailing economies to question the ability of the Fund to deal with international economic emergencies swiftly and

effectively.[4] Washington's reluctance to participate in the Thai rescue package of 1997 - in contrast to the 1994 bailout of Mexico – particularly angered policymakers in Southeast Asia (Emmerson 1998).

The stringent conditions attached to IMF loans during the Asian Financial Crisis have been heavily criticized within East Asia. The former South Korean President Kim Dae Joong summed up his country's negative sentiment toward the Fund by naming the day of IMF disbursement "National Economic Humiliation Day." The experience of the 1997 regional economic collapse is widely remembered as the "IMF Crisis" in Korea and the second national humiliation since Japanese colonization. Thai President Taksin Sinawatra described the paying off IMF loans as a "liberation" and restoration of the country's "dignity."[5] Despite being the largest creditor state to the region, Japanese Ministry of Finance Officials also vehemently argued against the IMF's policy prescriptions and were largely ignored – former Ministry of Finance Vice Minister Watanabe noted that the IMF "would not cooperate" during the Asian Crisis, preferring to impose conditions first and provide funds later, hence worsening the situation beyond what was necessary.[6] One Japanese Ministry of Finance Official referred to IMF policy during the crisis as "flagellation of dead bodies."[7] Charles Adams, Singaporean professor and former IMF assistant director for East Asia, noted that "There's an implicit recognition that conditionality during the Asian crisis was too tough."[8] East Asian animosity towards the IMF cannot be dismissed as political posturing shared by all recipients of IMF

[4] Speech by John Lipsky, First Deputy Managing Director of the International Monetary Fund, at the 2009 Federal Reserve Bank of San Francisco Conference, Santa Barbara, California.
[5] "IMF Bailout: PM Sets Date for 'Liberation,'" *Nation*, January 3, 2003.
[6] "Why is Asia building a cache of dollars?; Asean+3 will breathe new life into 'dead' Asian Monetary Fund proposal when they meet on the sidelines of the ADB's annual meeting in May," *The Business Time Singapore*, March 10, 2005.
[7] Personal Interview, Japanese Ministry of Finance Official, March 2006.
[8] Simon Montlake, " Doubt Greets IMF Bailout Offers," *Christian Science Monitor*, Novemeber 21, 2008.

lending. During the 2008 financial crisis, of 30 emerging economies that received IMF financing, none were from East Asia, despite a compelling need in several countries – Korea and Singapore sought and received bilateral swaps from the US Federal Reserve.

The negative experience during the crisis provided a key impetus for East Asian states to accumulate stockpiles of international reserves to avoid future involvement of the IMF. In light of the crisis, Chinese financial officials viewed IMF intervention in China as inconceivable and pursued reserve accumulation and capital controls to buttress the economy against the possibility of a future crisis.[9] Deputy Governor of the People's Bank of China, Gang Yi, asserted that "Our abundant foreign exchange reserves could protect the banking industry from the impacts of financial crisis."[10] Simultaneously, China started advocating aggressively for greater voice in the IMF, as Prime Minister Wen Jiaobao noted, "We believe it is imperative that we should first undertake reform in international financial institutions, including the IMF. And through reform, we should increase the voting share, the representation, and the say of developing countries. "[11]

It is informative to compare the Asian Crisis to the Mexican Crisis of 1994. At the initial stages, these two crises were comparable in their potential consequences for the world financial system. Aggregate global bank exposure to Mexico and Thailand was about the same, at $50-60 billion.[12] However, the distribution of economic exposure, both financial and non-financial, varied considerably. The US was heavily exposed to Mexico and other Latin American countries where contagion was most likely – Mexico alone represented about 25% of US lending to developing countries on the eve of the crisis. In contrast, Japan was heavily exposed to

[9] Personal Interview, Chinese Government Official, June 2010.
[10] Gang Yi, Director, State Administration of Foreign Exchange; Deputy Governor, People's Bank of China, Remarks made at the Press Conference for the Third Session of the 11th National People's Congress, March 13, 2010.
[11] Premier Wen Jiabao's Interview with the Financial Times. http://www.fmprc.gov.cn/eng/zxxx/t535971.htm

[12] Data from the Bank for International Settlements.

Thailand and other East Asian states on the eve of the Asian Crisis, with Thailand accounting for about 25% of lending to developing countries (Lipscy 2003).

In concert with the US Treasury, the IMF responded quickly to the 1994 Mexican financial crisis. Less than a month into the December 1994 currency crisis in Mexico – during which the Peso was allowed to float following a steep devaluation – the IMF assembled a $30 billion emergency loan package on top of the $20 billion financial support package of loans and credits promised by the US.[13] This swift response was partially to prevent the crisis from spreading to or unleashing a wave of migrants into the United States, the largest shareholder in the IMF, which also exercises outsized informal influence. The Mexican bailout was also generally perceived as less onerous than those applied to East Asian countries.[14]

Biased application of policy prescriptions by the IMF is an issue of concern not only for developing countries vulnerable to balance of payments crises. There are also potential consequences for macroeconomic performance in closely-integrated developed economies. US banks were heavily exposed on the eve of the 1994 Mexico Crisis. The IMF rescue measures left US financial institutions largely unscathed, in direct contrast to Japanese financial firms, which were the most exposed to East Asia during the 1997-98 crisis. As Figure 1 demonstrates, Japanese financial institutions increased loan loss provisions dramatically in 1997-98, while no such trend is observed for US institutions during the Mexican Crisis. Japan was suffering through its own financial difficulties at the time, so the increase in provisions cannot be attributed to the crisis alone. However, other indicators make it clear that the crisis had a serious

[13] "Use of the Exchange stabilization Fund to Provide Loans and Credits and to Mexico," from Memorandum to Edward S. Knight, General Counsel, Treasury Department (Accessed from the Department of Justice website;http://www.justice.gov/olc/esf2.htm)

[14] E.g., according to data compiled by Copelovitch (2010a), the Mexican package contained 6 total conditions, compared to 9 for Thailand, 10 for South Korea, 17.5 for Indonesia.

adverse impact on Japanese financial institutions. Moody's downgraded all major Japanese financial institutions in 1997-1998, explicitly citing exposure to the Asian Crisis. There were no downgrades of US institutions in 1994 citing the Mexican episode (Van Rijckeghem and Weder 2000). In addition, estimates by the OECD suggest the Asian Crisis shaved 0.8-1.3% off of Japanese GDP growth. The crisis therefore also affected Japanese financial institutions through their domestic loan book. One potential consequence of this policy inconsistency is that the IMF may give US and European financial institutions an unwarranted advantage by lowering – and therefore distorting – the risk of loss from their international lending activities.

Their perceived lack of influence in the IMF is an important factor that has compelled East Asian countries to secure alternative forms of economic insurance for potential future crises. One such avenue has been the creation of regional swap agreements – the Chiang Mai Initiative and Chiang Mai Initiative Multilateralization – but these mechanisms remain largely dysfunctional and have not been utilized (Grimes 2011). The other main responses have been self-insurance through reserve accumulation and bargaining for greater say in the IMF. At both the APEC CEO Meeting and the G-20 meeting held in Pittsburgh, Pennsylvania, South Korean President Lee Myung Bak emphasized the need to reform the fundamental structure of the IMF by arguing that the fund's inability to provide global financial security is pushing countries to accumulate excess international reserves for self-insurance. Lee stated that, "The main reason for the sharp increase of currency reserves is that the IMF and the World Bank have failed to set up effective systems for the prevention of a crisis." [15] A Japanese Ministry of Finance official concurred, noting that "Now, each country wants to have its own insurance policy and not rely

[15] "IMF and World Bank Should Carry Out Reforms," *Yeonhap News*, September 25, 2009.

on the IMF," even though reserves represent a costly and "inefficient" form of insurance.[16] John Lipsky, first Deputy Managing Director of the IMF, conceded as much, noting that, "If a broader set of countries could rely on trusted counterparties or a multinational agency like the IMF in a crisis, we wouldn't have a world where countries are holding 20 or 30 or 40 percent of their GDP in reserves."[17]

The Asian Financial Crisis clearly revealed to East Asian leaders that the IMF could not serve as a reliable lender of last resort. As Table 1 shows, in China, South Korea, and ASEAN countries, the volume of reserves (measured as the 10 month average of reserves in imports) surged by 80%, 216%, and 42%, respectively, following the 1997 regional meltdown.[18] In contrast, the Mexican Crisis of 1994 did not lead to a change in Mexico's level of international reserves, which actually fell by 3% in the years after its crisis. Despite its crisis and involvement with the IMF, Mexico has not pursued aggressive self-insurance. In addition, Mexico was the first country to express interest in IMF's Flexible Credit Line (FCL) during 2008 financial crisis and was provided $47 billion dollars in April 2009, less than a month after its initial application. The attitude of Asian countries towards the Fund again stood in a stark contrast to that of Mexico. While many Asian countries had access to the FCL, a short-term loan lacking the stringent requirements typical of longer-term IMF loans, both the South Korean and Indonesian governments explicitly ruled out any type of IMF aid.[19] When the Wall Street Journal reported that South Korea was one of the countries set to receive the FCL, the South Korean government

[16] "Why is Asia building a cache of dollars?; Asean+3 will breathe new life into 'dead' Asian Monetary Fund proposal when they meet on the sidelines of the ADB's annual meeting in May," *The Business Time Singapore*, March 10, 2005.
[17] Speech by John Lipsky, First Deputy Managing Director of the International Monetary Fund, at the 2009 Federal Reserve Bank of San Francisco Conference, Santa Barbara, California.
[18] IMF, International Financial Statistics.
[19] http://www.fnnews.com/view?ra=Sent1101m_View&corp=fnnews&arcid=00000921603424&cDateYear=2009&cDateMonth=03&cDateDay=23

vehemently rejected any potential association with the IMF, arguing that Korea does not need external support with its economy soundly backed by sizeable foreign reserves.[20]

One common alternative explanation for reserve accumulation in East Asia is that it is a byproduct of export-oriented policies (Aizenmann and Lee 2005; Dooley et al. 2003; de Beaufort Wijnholds and Sondergaard 2007). The underlying logic is that Asian central banks purchase foreign exchange to keep their currencies weak and thus promote exports. However, East Asian countries have been pursuing export-oriented industrialization for decades, long before the Asian Financial Crisis (Haggard 1990; Rowen 1998). This explanation cannot account for the sharp acceleration in reserve accumulation subsequent to the Asian Crisis.

Another counterpoint to the export-based explanation for Asian reserve accumulation is the behavior of Taiwan. Taiwan is essentially the only large developed economy that has not been an IMF member since it was replaced by the People's Republic of China in 1980. U.S. government officials of the American Institute in Taiwan, the de facto embassy, confirm that there are no arrangements, formal or informal, for a rescue of Taiwan in the event of a financial crisis. For this reason, Taiwan offers a unique opportunity to examine the counterfactual case of a major economy without any prospect of being subject to IMF moral hazard. Importantly, Taiwan is not distinguished from other East Asian countries in terms of its export-orientation – its export-oriented developmental policies are often compared to other Asian "Tigers" such as South Korea and Singapore (Rowen 1998; Rodrik 1994).

Consistent with our theoretical premises, Taiwan has traditionally adopted an extremely conservative policy of self-insurance. Despite its relatively small size, Taiwan's international

[20] http://www.pressian.com/article/article.asp?article_num=60081215154502

reserves are the fourth largest in the world, only exceeded by China, Japan, and Russia.[21] Taiwan has also adopted an extremely cautious stance towards financial liberalization and capital inflows, and it has no sovereign wealth fund, choosing to invest its reserves primarily in US Treasuries and gold. This behavior is driven by the realization that no international organization will come to Taiwan's rescue in the event of a crisis.[22]

Taiwan's policies after the Asian Financial Crisis provide further support for our claim that the IMF's policies were responsible for a significant portion of reserve accumulation in the region since 1997-98. While other major East Asian countries sharply increased their foreign reserves after the 1997-98 crisis, Taiwan's reserves were more stable in comparison – reserves measured in months of imports averaged 14.6 during the ten years before 1998 and 13.8 in the ten years thereafter. Although many observers have described the reserve accumulation of states such as China and Korea to be "excessive," they are still below or comparable to levels maintained by Taiwan, as shown in Table 1. In effect, East Asian states have been converging towards self-insurance at levels consistent with no possibility of IMF involvement.

The substantive effect of this reserve accumulation is likely to have been large. Based on the current asset allocation and reserve levels of China, South Korea, and ASEAN countries, we can calculate a crude approximation for US dollar holdings that would have prevailed had pre-1997 levels of reserves been maintained. According to our calculations, the incremental reserve accumulation of these countries accounted for about $550 billion of US Treasury and Agency assets. This is comparable in magnitude to the second round of Quantitative Easing implemented by the Federal Reserve in 2010 of about $600 billion.

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[21] "Taiwan's Foreign Reserves 4th Largest in World," *The China Post*, 6-4-2011.

[22] This description of Taiwan's policies and motivations is based on discussions with Taiwanese officials in the Ministry of Economic Affairs and Foreign Affairs, as well as U.S. representatives as the American Institute in Taiwan, the de facto U.S. Embassy.

In sum, several pieces of evidence argue in favor of East Asian reserve accumulation as being driven by IMF distortions rather than export-oriented policies. First, policymakers, in public statements and interviews, indicate that the IMF was a critical factor. Second, export-oriented policies in East Asia have been in place for decades, but reserve accumulation seriously took off only after the Asian Crisis clearly demonstrated the region's lack of leverage over the IMF. Third, a country with comparable export-oriented policies but no IMF membership, Taiwan, has held reserves at relatively constant levels since the Asian Crisis. Fourth, although East Asia's reserve accumulation since the late-1990s has been described as too excessive to be motivated by precautionary concerns, current levels are either comparable to or below those of Taiwan, which is the only major economy in the contemporary international system which truly has no choice but to self insure.

Empirical Analysis

In this section, we will provide a more general, quantitative analysis of our propositions based on data from 1980-2010. We extend the data from Barro and Lee (2005). The data contains information on 130 countries in five year increments, i.e. 1980-1985, 1985-1990, etc. We follow Barro and Lee in using five year increments as some data, such as representation among IMF personnel, are not available on a yearly basis. We extended the data by adding additional variables and information for recent years. Independent variables are coded as of the beginning of each period, while dependent variables are coded as average levels over the five year period. A summary of variables used and sources is available in Table 2.

We begin by considering the determinants of IMF lending. Existing quantitative analyses of creditor state influence over IMF lending have generally focused on the possibility that IMF lending is unduly influenced by US interests.[23] IMF lending appears to be influenced by a recipient's diplomatic ties to the US as expressed by proximity of voting profile in the UN General Assembly (Thacker 1999), intensity of trade with the US (Barro and Lee 2005), and bank lending from US financial institutions (Broz and Hawes 2006; Oatley and Yackee 2004). However, these studies have generally analyzed these variables piecemeal and have often produced contradictory results. For example, while Thacker (1999) and Oateley and Yackee (2004) find that General Assembly voting is a useful predictor of IMF lending, Broz and Hawes (2006) find no evidence of this. Thacker (1999) and Bird and Rowlands (2001) find that a high level of exports from the US are negatively related to IMF lending, while Barro and Lee (2005)

[23] A notable exception is Copelovitch (2010b), who analyzes the impact of divergence among major creditor states on IMF policies.

find a positive association between IMF lending and trade intensity with the US. In addition, although Barro and Lee (2005) finds that employment of home country nationals among IMF economists is a useful predictor of IMF lending, the variable is not included in most other studies. In deference to these previous studies, we consider a range of proxies for influence over IMF policymaking. Two measures capture the potential for countries to exert direct influence over IMF policymaking: quota share and share of IMF economists. Other variables are proxies for influence via influential members of the IMF: UN voting affinity, trade ties, and bank exposure to the US, major European states, and Japan.

In terms of IMF lending, there are three dependent variables of interest – the size of IMF loans as a share of the receiving country's GDP averaged over each five year period, the fraction of months during each five-year period that a country operated under an IMF loan program,[24] and a dichotomous variable indicating an approval of any new IMF programs during the five year period. In terms of IMF conditionality, we use PA (prior actions required by the IMF prior to loan disbursement) and PC (performance criteria), available from Copelovitch (2010a, 2010b). As the dependent variables are bounded, we use Tobit specifications (Tobit 1958; Amemiya, 1984) to avoid potential bias from censoring.[25] For the dichotomous approval variable, we use

[24] e.g. if a country had an IMF program for the entire period, this variable would be 1. If it had a program for 57 out of 60 months, the a variable would be 57/60 = 0.95, etc.

[25] e.g., IMF lending is bounded by zero at the lower limit. Hence, the Tobit specification is:

$L_{it}^* = \alpha + \beta X_{it} + \delta * time_t + u_{it}$, $L_{it} = \max [0, L_{it}^*]$,

whereas program participation is bounded between zero and one, hence the specification is:

$P_{it}^* = \alpha + \beta X_{it} + \delta * time_t + u_{it}$, $P_{it} = \min[1, \max(0, P_{it}^*)]$,

where L_{it} and P_{it} are the relevant dependent variables, the vector X_{it} denotes country specific independent variables as shown in the regression tables and footnotes, and u_{it} is a random error term. "$time_t$" denotes period dummies to control for common external factors such as world macroeconomic conditions.

probit.[26] Standard economic controls for determinants of IMF lending are included in all statistical models, measured at the beginning of each five year period. These are international reserves as a proportion of imports, per capita GDP, GDP, the lagged GDP growth rate,[27] and a dummy variable indicating membership in the OECD. The squares of per capita and absolute GDP are included to account for the possibility of a nonlinear relationship between those variables and IMF lending. As noted by Barro and Lee (2005), other economic variables such as magnitude of current account deficits and inflation are not meaningful predictors of IMF lending once one controls for lagged GDP growth and international reserves. All absolute, continuous variables are logged to avoid undue influence of outliers.[28] Finally, we also include dummy variables for each five year period.

Since the political determinants of IMF lending have been analyzed extensively elsewhere, we will omit an extensive discussion of the empirical results and simply report our findings. Of the variables analyzed, bank lending from the United States or major European countries was most consistently associated with generous IMF policies – more lending and fewer conditions. Of the other variables, share of IMF economists and share of quota were generally signed in the correct direction but not consistently statistically significant. Other proxies for ties with large creditor states, i.e. UN voting and trade, were generally not strongly associated with IMF lending once bank lending was included in the models.

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[26] i.e.:

$A_{it}^* = \alpha + \beta X_{it} + \delta^* time_t + u_{it}$, $A_{it} = 1$ if $A_{it}^* > 0$ and $A_{it} = 0$ if $A_{it}^* \leq 0$.

Variable definitions are analogous to the previous footnote.

[27] i.e., for the previous five year period.

[28] For the BIS bank lending data, years prior to 1983 are unavailable. Hence, we use the value for 1983 for the 1980-1985 period. Dropping this period from the analysis does not alter the substantive conclusions.

Hence, we focus primarily on bank lending from the United States and Europe[29] as a proxy for expected influence in the IMF. We draw comparisons with Japan, which is the other major source of international bank lending, but has historically been underrepresented and unable to exert influence within the IMF (Lipscy 2011). Figure 2 provides an illustration. The figure plots the predicted probability of IMF loan approval according to counterfactuals generated from a probit specification in which US and EU bank exposure is interacted with Japanese bank exposure. The figure shows that the probability of IMF loan approval increases dramatically as bank lending from the United States and European countries increase, but there is no change in the probability of IMF loan approval with respect to Japanese bank lending. For this reason, our theory predicts that countries with high exposure from the US and Europe should be more susceptible to moral hazard. This should be reflected in a lower tendency to self-insure through reserve holdings, as well as more frequent incidence of currency crises. In comparison, countries with high exposure from Japanese financial institutions have no reason to expect generous IMF policies in the event of a crisis. As lending from Japan increases, we generally expect countries to either maintain a similar level of reserves or increase reserves as a precautionary measure against capital outflows. Since such countries are not subject to increased moral hazard, we would not expect any change in the incidence of currency crises.

For our first model, the dependent variable is reserves, expressed in months of imports. As with IMF lending, we use a Tobit specification as the dependent variable is bounded at zero.[30] The statistical results are presented in the first two columns of Table 3. In the first

[29] We use lending from France, Germany, and the UK, as these are the largest international lenders in Europe and likely to hold the most sway in the IMF. Including other, smaller European lenders does not alter the substantive results.

[30] i.e., the Tobit specification is:

$R_{it}^* = \alpha + \beta X_{it} + \delta * time_t + u_{it}$, $R_{it} = \max [0, R_{it}^*]$,

column, we include basic macroeconomic controls: per capita GDP and its square, GDP and its square, the lagged GDP growth rate, the rate of inflation, and a dummy variable indicating membership in the OECD. In the second column, we include several additional variables that are likely to be correlated with the dependent variable but also endogenous to government decisions over reserves – exports, imports, a dichotomous indicator for currency peg, and a measure of currency undervaluation. It could be problematic to include these variables in our model, as a government that wishes to accumulate reserves could do so by weakening the exchange rate and running a current account surplus – we would be controlling for a variable that is a consequence of our key explanatory variables (King et al. 1994). However, since the leading alternative explanation for reserve accumulation is the mercantilist account, it is helpful to examine whether the substantive effect we find runs entirely through the exchange rate and trade channels. As the table shows, bank exposure from the US and European states is consistently associated with a lower level of reserve holdings across both specifications, while bank exposure from Japan is not.

We then consider the incidence of currency crises. We use the currency crisis coding from Hutchinson (2001). The variable is dichotomous with 1 indicating any occurrence of a currency crisis during the relevant five year period, and zero otherwise. We use a probit specification as the dependent variable is dichotomous.[31] The third and fourth columns of Table

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where R_{it} is the dependent variable, the vector X_{it} denotes country specific independent variables as shown in the regression tables and footnotes, and u_{it} is a random error term. "$time_t$" denotes period dummies to control for common external factors such as world macroeconomic conditions.

[31] i.e., $C_{it}^* = \alpha + \beta X_{it} + \delta * time_t + u_{it}$, $C_{it} = 1$ if $C_{it}^* > 0$ and $C_{it} = 0$ if $C_{it}^* \leq 0$.

where C is a dichotomous variable indicating the occurrence of a currency crisis, the vector X_{it} denotes country specific independent variables as shown in the regression tables and footnotes, and u_{it} is a random error term. "$time_t$" denotes period dummies to control for common external factors such as world macroeconomic conditions.

3 show that high bank exposure from the US and Europe is consistently associated with a higher likelihood of currency crises, while bank exposure from Japan is not.

We also conducted several robustness checks. To make sure our results are not completely contingent on the East Asian dynamics described in the previous section, we included region dummies and also excluded the 2000-2010 period when East Asian reserve accumulation took off. We also included random effects to account for unobserved heterogeneity among individual countries. To account for oil producers, who tend to hold a high level of reserves for unrelated reasons, we also included a dummy variable for oil exporters. None of these alternative specifications changed the substantive findings.

To provide a more intuitive depiction of our results, Figure 3 plots the predicted levels of reserves from a variant of our model in which we interact US/European bank exposure with Japanese bank exposure. The figure shows a pattern consistent with our expectations. As countries receive more bank lending from Japan, there is a tendency to hold a slightly higher level of reserves. This makes sense from a precautionary standpoint: since foreign capital flows can reverse quickly, greater dependence on foreign bank lending should motivate countries to seek greater self-insurance. However, this pattern is strikingly reversed for countries receiving large volumes of bank lending from the US and Europe. As lending from the US and Europe increase, countries tend to hold a much *lower* levels of reserves. As Figure 4 illustrates, large bank exposure from the US and Europe is also associated with a dramatically higher predicted probability of currency crisis incidence. In direct contrast, bank exposure from Japan is not associated with any change in the likelihood of crisis incidence.

These findings are broadly consistent with our theoretical expectations that IMF moral hazard is distributed unevenly across the international economy. Countries with strong

economic ties to the US and Europe, particularly through financial institutions, have tended to hold a lower level of reserves and more frequently experienced crises. Importantly, our findings are not driven by East Asia or the most recent period of aggressive reserve accumulation among developing countries.

Conclusion

In this paper, we have argued that political imbalances within the IMF have important, real economic consequences for the global economy. Because IMF decision-making is heavily politicized and biased towards the interests of Western states, the international system is effectively governed by a biased insurance mechanism. This bias has left countries and financial institutions with strong ties to the West subject to asymmetric moral hazard, while those lacking such ties have been compelled to pursue aggressive self-insurance through the accumulation of international reserves.

We illustrated our logic by examining the experience of East Asia since the 1997-98 financial crisis. That crisis highlighted the powerlessness of East Asian states over the decision-making apparatus of the IMF and compelled these countries to accumulate large quantities of international reserves. We established the association between reserve accumulation and the IMF through several means. First, interviews and public statements by policymakers in the region clearly implicate a desire to avoid further entanglement with the IMF as a primary motivation for reserve accumulation. Second, we drew comparisons with Taiwan, which is not an IMF member for political reasons, but shares many essential characteristics with other East Asian economies, such as an export-orientation and undervalued exchange rate. In contrast to other East Asian countries, Taiwan has always held a high level of reserves and did not alter its behavior after 1997-98, which is consistent with our theoretical account and inconsistent with other accounts that emphasize mercantilist motives. We also drew comparisons with Mexico, which can expect generous treatment from the IMF by virtue of its proximity to the United States. Unlike East Asian states, Mexico has always held a low level of reserves and did not markedly

increase this level after the 1994 crisis. Mexico was also the first country to seek a loan from the IMF during the 2008 global crisis, while all ASEAN+3 countries refused to do so despite a compelling need for liquidity in several cases.

We also analyzed a panel data set covering 1980-2010 to establish that our assertions are not limited to a particular region or time period. We find that countries with close ties to the West – as expressed by bank lending from the United States and major European states – tend to exhibit strong characteristics of moral hazard, i.e. low levels of reserves and frequent currency crises. In contrast, strong ties to Japan, the other major international creditor during the time period analyzed, was not associated with moral hazard.

Our account clearly establishes that contestation over representation in the IMF is not simply a matter of national ego or prestige. Developing countries with limited influence within the IMF are forced to bear the costs of holding a large quantity of reserves in conservative assets such as US Treasury securities. This perverse flow of capital from developing to developed countries over the past decade played an important role in exacerbating global imbalances and fueling the US housing bubble in the mid-2000s. In effect, our account suggests that political distortions in the IMF played an indirect role in creating the preconditions for the global financial crisis of 2008.

We also highlight the asymmetric impact of IMF lending on the activities of internationally active financial institutions. Our quantitative analysis indicates that the IMF is much more likely to bail out highly-exposed Western financial institutions on generous terms. In domestic financial markets, large banks that are deemed "too big to fail" receive significant advantages, including higher valuations (Brewer III and Jagtiani 2009) and lower risk premiums (Voelz and Wedow 2009). As we have asserted, "too big to fail" in the international context is a

function of influence over IMF policymaking. As such, Western financial institutions are likely to enjoy unfair competitive advantages in international lending. For the past several decades, Japanese financial institutions have been the primary non-Western lenders in international markets, and have therefore borne the brunt of this asymmetry. As other countries develop economically and expand their international financial activities, this issue is likely to become more salient.

The IMF, having realized that international monetary coordination cannot succeed without the support of emerging countries such as China and Korea, implemented a review of the quota system in 2008 in order to pacify angered Asian members by providing them with more political leverage within the institution. However, these measures are modest in their formal effect and do very little to remedy informal biases in IMF governance. While China and Korea saw an increase in their voting rights during the March 2011 reallocation of voting power, the voting share of China, Japan, and Korea – the joint holders of approximately 19% of nominal world GDP – continues to hover at approximately 14%.[32] This disparity is set to widen further as economic growth in East Asia exceeds that of the West. While the quota realignment has resulted in a 0.52% drop in the US quota (from 17.02% to 16.50%), US veto power remains unaffected under an IMF system that requires an 85% supermajority from its Executive Board for its policy approvals.[33] The Fund's top post continues to be occupied by a European. When IMF chief Strauss Kahn resigned in May 2011, European countries were able to successfully place their preferred candidate – French Finance Minister Christine Lagarde – at the helm. As Russian Finance Minister Alexei Kudrin noted, "As long as the Fund is seen as an organization in which all decisions are taken by a relatively small number of rich countries, and then

[32] Statistics by IMF Finance Department (http://www.imf.org/external/np/sec/pr/2010/pdfs/pr10418_table.pdf)
[33] http://web1.iseas.edu.sg/?p=4062

announced in the name of the international community, mistrust in the Fund will persist in many regions of the world."[34]

[34] Lesley Wroughton and Emily Kaiser, "IMF Told to Toughen Scrutiny of Rich Powers," *Reuters*, 10-10-2010.

Table 1: 10 Year Average of Reserves (Months of Imports) Before and After Asian and Mexican Crises

	Before Crisis 1987-1996	After Crisis 1998-2007	% Change
China	6.28	11.28	80%
South Korea	2.22	7.02	216%
ASEAN Average	2.97	4.21	42%
Taiwan	14.62	13.78	-5%
	1984-1993	1995-2004	% Change
Mexico	2.65	2.57	-3%

Note: Whereas East Asian states that are IMF members dramatically increased their reserve holdings after the Asian Crisis, Taiwan did not, and Mexico did not after its 1994 crisis. Taiwan is not an IMF member and therefore cannot expect any assistance in the event of a crisis. Mexico's economic and geographic proximity to the United States means generous treatment by the IMF is likely.

Data Source: International Financial Statistics, IMF; Statistical Database of the Central Bank of the Republic of China (Taiwan).

Table 2: Variable Descriptions

Variable	Explanation	Source
OECD membership	Identifier for OECD membership	OECD Website : List of OECD Member Countries
Reserves	International reserve, months of imports	World Development Indicator : World Bank (http://data.worldbank.org/data-catalog)
IMF Participation Rate	IMF Participation rate (SBA and EFF) * Fraction of months during each five-year period that a country operated under an IMF loan program	IMF Finance Department Website - Lending Arrangements (http://www.imf.org/external/np/fin/tad/extarr1.aspx)
IMF loan-GDP Ratio	IMF loan-GDP ratio (SBA and EFF)	IMF finance Department Website - Lending Arrangements (http://www.imf.org/external/np/fin/tad/extarr1.aspx) GDP : World Development Indicator: World Bank (http://data.worldbank.org/data-catalog)
IMF Loan Approval	IMF loan approval frequency over 5 years(SBA and EFF)	IMF Finance Department Website - Lending Arrangements (http://www.imf.org/external/np/fin/tad/extarr1.aspx)
PA	Prior actions required by the IMF prior to loan disbursement	Copelovitch (2010a, 2010b)
PC	Performance criteria	Copelovitch (2010a, 2010b)
Currency Valuation	Measure for undervaluation of currency	Dani Rodrik (2008) The Real Exchange Rate and Economic Growth available at (http://www.hks.harvard.edu/fs/drodrik/research.html)
Peg	Identifier for pegged Exchange Regime	Shambaugh (2004) Exchange Rate Regime Classification (http://www.dartmouth.edu/~jshambau/)
Import	Country's total import (5 year average)	Trade: UN Comtrade (http://comtrade.un.org/db/default.aspx) GDP: World Development Indicator: World Bank (http://data.worldbank.org/data-catalog)
Export	Country's total export (5 year average)	Trade: UN Comtrade (http://comtrade.un.org/db/default.aspx) GDP: World Development Indicator: World Bank (http://data.worldbank.org/data-catalog)
Openness	Trade openness (export + import/GDP, 5 year average)	Import and export value from UN Comtrade Database, GDP from World Development Indicator : World Bank (http://data.worldbank.org/data-catalog)
Inflation	Inflation, consumer prices (annual %), Inflation, GDP deflator (annual %)	World Development Indicator : World Bank (http://data.worldbank.org/data-catalog)

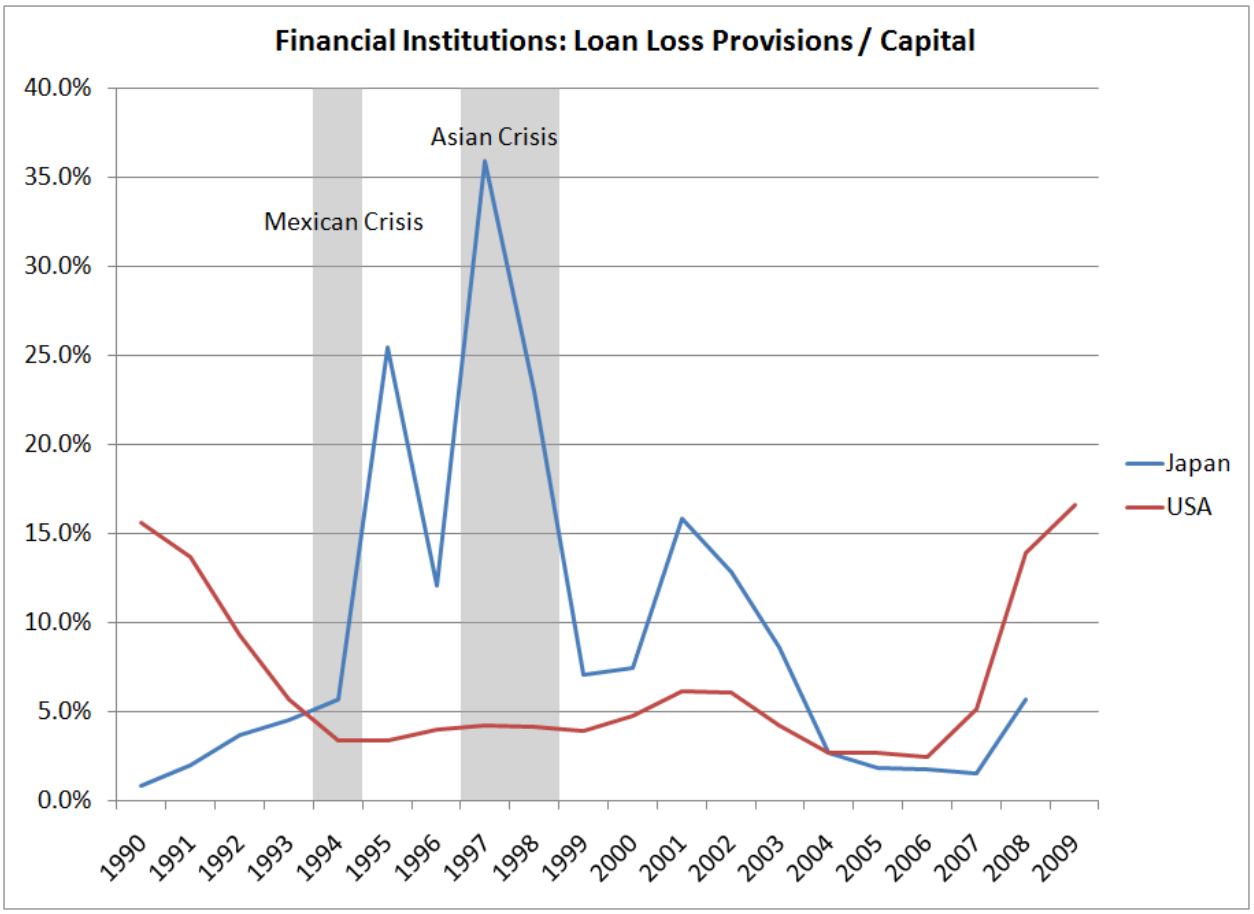
Lagged Per Capita GDP Growth Rate	Per capita GDP growth rate,lagged * Average over the previous five-year period	World Development Indicator : World Bank (http://data.worldbank.org/data-catalog)
GDP Per Capita	GDP per capita (2002 thousand US dollars)	World Development Indicator : World Bank (http://data.worldbank.org/data-catalog)
GDP	GDP in 2002 million US dollars	World Development Indicator : World Bank (http://data.worldbank.org/data-catalog)
Share of IMF Staff	Share of nationals among IMF economists	IMF Diversity Report, Various Years
Quota Share	Share of IMF quota	IMF Annual Reports, Various Years
Currency Crisis	Dichotomous Indicator of Currency Crisis Incidence	(Hutchinson 2001)
Japan Bank Lending	International Positions of Japanese Banks in Country (Billions of US Dollars)	BIS, Locational Banking Statistics
US Bank Lending	International Positions of US Banks in Country (Billions of US Dollars)	BIS, Locational Banking Statistics
EU Bank Lending	International Positions of French, German, and UK Banks in Country (Billions of US Dollars)	BIS, Locational Banking Statistics
US UN Affinity	UN voting affinity score for the US	Constructed from Erik Gartzke's UN voting data (http://dss.ucsd.edu/~egartzke/htmlpages/data.html)
EU UN Affinity	UN voting affinity score for major Europe (Average value for Germany, UK, and France)	Constructed from Erik Gartzke's UN voting data (http://dss.ucsd.edu/~egartzke/htmlpages/data.html)
Japan UN Affinity	UN voting affinity score for Japan	Constructed from Erik Gartzke's UN voting data (http://dss.ucsd.edu/~egartzke/htmlpages/data.html)
Japan Trade	Bilateral trade with Japan (million US dollars)	Trade: UN Comtrade (http://comtrade.un.org/db/default.aspx) GDP: World Development Indicator: World Bank (http://data.worldbank.org/data-catalog)
EU Trade	Bilateral trade with France, Germany, UK (million US dollars)	Trade: UN Comtrade (http://comtrade.un.org/db/default.aspx) GDP: World Development Indicator: World Bank (http://data.worldbank.org/data-catalog)
US Trade	Bilateral trade with the US (million US dollars)	Trade: UN Comtrade (http://comtrade.un.org/db/default.aspx) GDP: World Development Indicator: World Bank (http://data.worldbank.org/data-catalog)

Table 3: IMF Bias and Moral Hazard, 1980-2010

	Reserves (Tobit)	Reserves (Tobit)	Currency Crisis (Probit)	Currency Crisis (Probit)
US & Europe Bank Exposure	-0.57* (0.11)	-0.38* (0.15)	0.20* (0.06)	0.21* (0.09)
Japan Bank Exposure	0.14* (0.06)	0.12 (0.08)	-0.08* (0.03)	-0.05 (0.04)
US UN Affinity	-0.16 (0.88)	-0.16 (1.21)	-0.28 (0.62)	-0.46 (0.85)
Europe UN Affinity	0.09 (2.00)	-0.53 (2.68)	-1.96 (1.30)	-0.85 (1.69)
Japan UN Affinity	0.95 (1.75)	0.91 (2.27)	2.32* (1.15)	1.87 (1.48)
Quota Share	-0.01 (0.02)	0.20 (0.26)	0.17 (0.10)	0.06 (0.16)
Share of IMF Staff	-0.18 (0.15)	-0.10 (0.18)	0.10 (0.08)	-0.04 (0.10)
Exports		3.93* (1.67)		-0.95 (1.18)
Imports		-4.73* (1.71)		1.03 (1.18)
Peg		-0.33 (0.31)		-0.36* (0.17)
Currency Valuation		0.37 (0.31)		-0.07 (0.22)
n	595	404	639	408

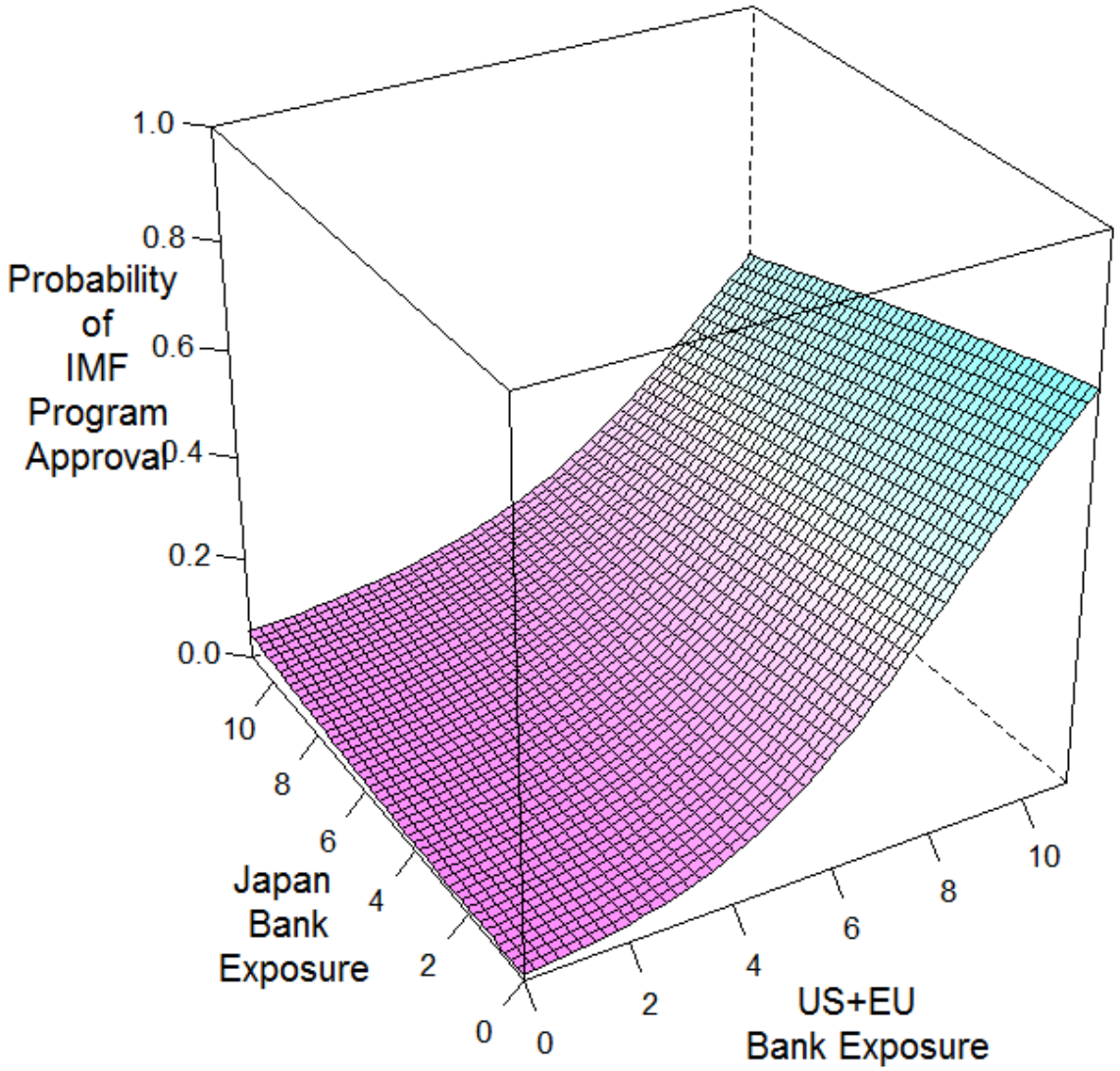
Note: Control variables included in the models and not shown in the table: per capita GDP growth rate, real GDP per capita and its square, log real GDP and its square, OECD dummy, and panel dummies. Observations are in five year increments (e.g., 1980-1985), with reserves measured as a five year average and currency crisis coded as 1 if any crisis occurs during the period. All independent variables are measured at the beginning of the five year period. Standard errors in parentheses. Star denotes a coefficient at least two standard errors removed from zero.

Figure 1



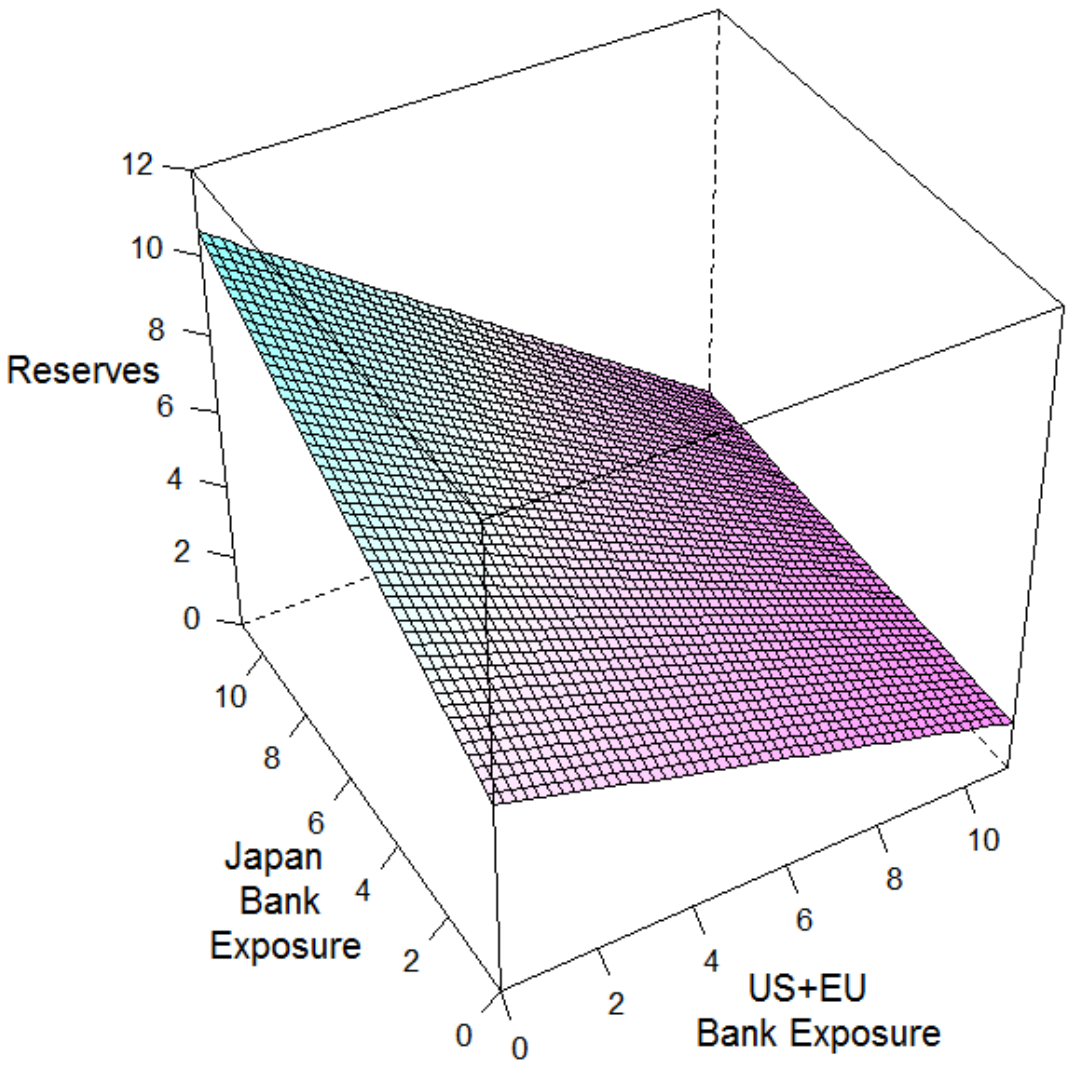
Note: Japanese financial institutions incurred major losses from the 1997-98 Asian Financial Crisis (see main body of text for details and caveats). Despite a comparable level of financial exposure, US financial institutions were not significantly affected by the 1994 Mexican crisis.
Source : OECD

Figure 2: Predicted Probability of IMF Program Approval According to Bank Exposure by Source



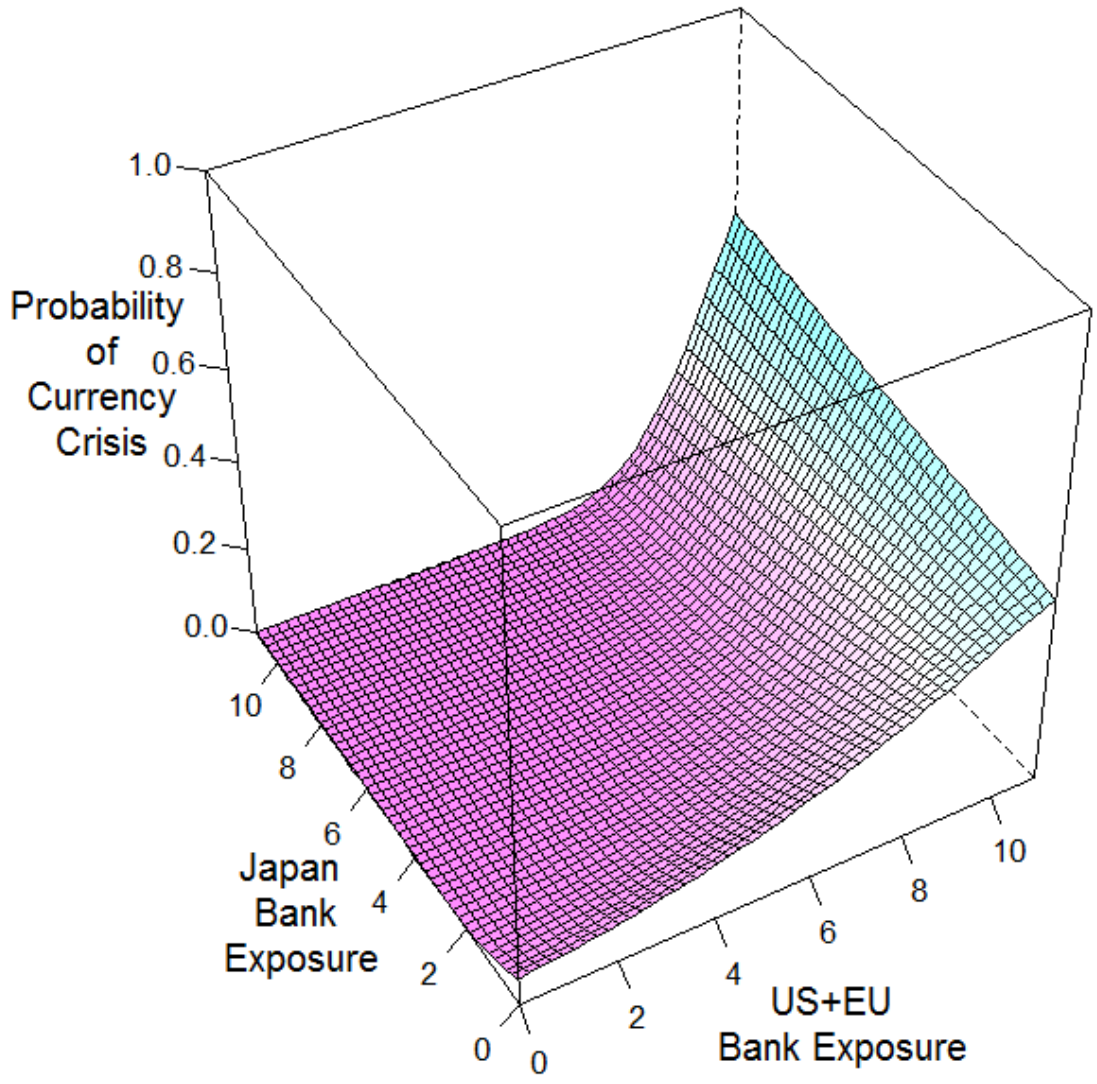
Note: This figure plots the predicted probability of an IMF program approval simulated from our probit model (King et al. 2000). The vertical axis is the predicted probability of approval during a five year period. The horizontal axes depict the natural log of bank lending received from the indicated lenders. The figure illustrates that IMF program approval is much more likely for countries that have received large volumes of lending from the United States and major European countries, but the likelihood of approval is largely invariant to the level of lending from Japanese financial institutions.

Figure 3: Predicted Level of Reserves According to Bank Exposure by Source



Note: This figure plots the predicted level of reserves simulated from our tobit model. The vertical axis is the predicted level of reserves, in months of imports. The horizontal axes depict the natural log of bank lending received from the indicated lenders. The figure illustrates that countries that have large bank exposure from the US and Europe tend to hold much less reserves than countries with low exposure, while the opposite is true for Japanese bank exposure.

Figure 4: Predicted Probability of Currency Crisis According to Bank Exposure by Source



Note: This figure plots the predicted probability of a currency crisis simulated from our probit model. The vertical axis is the predicted probability of a currency crisis during a five year period. The horizontal axes depict the natural log of bank lending received from the indicated lenders. The figure illustrates that countries that have large bank exposure from the US and Europe are much more likely to experience a currency crisis, while Japanese bank exposure is largely uncrelatd to the probability of a crisis.

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