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A Regional Repo Market Initiative for Global Financial Stability

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The prevailing global financial system suffers from a shortage of good collateral for increased reliance on nonbank secured lending. Given that the global financial crisis was mainly triggered by the collapse of the collateral pool for dealer-based credit intermediation, this issue needs to be resolved quickly for normalized credit supply. Primarily, increased supply capacity for safe assets that can serve as valid collateral is the key agenda. This would be possible with a better use of USTs that are kept in EME silos and a broader recognition of an emerging market sovereign collateral pool. The inclusion of new collateral into the expanded and invigorated repo system that includes Asia would stabilize global capital flows and improve financial stability. In a related context, a market-driven, risk-mitigating regional repo market initiative would also bring balance to an increasingly market-driven financial ecosystem and mitigate the global shortage of safe assets.

Keywords: international monetary system reform, regional repo market, collaterals, cross-border capital flows

Introduction

In the wake of global financial crisis, emerging economies are witnessing seemingly contradictory policy recommendations for the regional financial stability. Some argue for continued reliance on FX reserves [IMF (International Monetary Fund), 2013], while others question the validity of reserve practices of industrialized countries (Goldberg, 2013), and emphasize extensive swap arrangements among central banks (Steil & Walker, 2015; Allen & Moessner, 2010). Despite numerous efforts to secure financial stability in Asia, the region still remains shock-prone. Asia still remains as compensatory choices to adjust global portfolios as it lacks its own assets denominated with its own currencies. It is not certain whether this instability is the result of push and/or pull factors a priori, or inherent weaknesses in the system, but emerging economies need to look deeper into this for better understanding and effective remedies. In fact, it needs to be emphasized that emerging markets have resorted to a whole gamut of safety devices to achieve financial stability through the recurrent financial crises during the past decades. For instance, the build-up of massive FX reserves and bilateral swap arrangements with the US Federal Reserve in particular have been quite instrumental for EM economies in guarding against ever-growing market volatility associated with major crises (Obstfeld, Shambaugh, & Taylor, 2009). However, the recent global financial crisis has proven the limitations of conventional policy tools, e.g., sterilized FX intervention, FX reserves hoarding to prompt for ready liquidity against recurrent shocks. Further, the supervisory guidelines for liquidity have been strengthened with the Basel III. Even though it is not entirely clear that deepening swap agreements may weaken the precautionary motive for reserve accumulation recently

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(Aizenman, Jinjarak, & Park, 2011a; 2011b), the lingering volatility reawakens the extra needs for a different set of preparations for the future.

Going forward, recent changes in financial landscape call for renewed and structural approach by the EME. The future efforts need to start where it is most underdeveloped. It is well documented in literature that most emerging economies are experiencing tangible and substantial changes in the way they fund FX liquidity since the GFC (Baba & Packer, 2009). Despite the substantial changes in the way EMEs engage in FX funding, the stabilization measures are largely short-term fixes, not rigged into deeper and improved financial mechanism. As such, the shock-prone financial network that often gets dislocated and becomes irrelevant in times of need. In consequence, financial stability becomes harder to maintain or maintained at increasingly higher costs. Fundamentally, outsourcing of the financial system, which basically means hollowing out its own resources to utilize the outside system, would no longer work when external liquidity cannot be secured in a stable manner. The EMEs fall short of addressing this increasingly complex and complicated shock propagation channel and experience increased vulnerability against a more network-like financial system. Given the increasingly sophisticated risk profiles associated with trend changes for securitized banking and the heightened risk-sensitive supervisory guidelines of Basel III, the EME's capacity to tackle risk factors via market participation remains quite limited.

Broadly speaking, the current practices among EMEs need to be expanded into more market-based funding practice where the role of collateral becomes crucial. Since eligible collaterals are mainly used in repo markets, which is a principal venue for market-based funding channel in US and Euro, there needs to be sizable pool of safe assets for financial markets to function properly (Gourinchas & Jeanne, 2012). Given that basic inputs for repo transactions are treasuries, the Asian tradition of hoarding FX reserves needs to be changed primarily to allow better use of its holdings and/or increase supply of its own collateral pool. Since financial instabilities are mostly associated with excessive dependency on external markets for their FX funding needs, market-based funding channel in the region needs to be further strengthened. In practice, given the growing importance of repo market in money market operations and derivatives trading, the glaring missing link in Asia has been the lack of regional repo market itself and restrictive use of its asset pools as legitimate collateral.

In formulating the proposal for a regional repo market in Asia, two key observations can be added. First, it should be made clear that FX liquidity funding activities need to be institutionalized (i.e., formal exchange or swap facilities) rather than put on the back burner since that is something that cannot be handled by emerging economies on their own. Permanent market backup for FX funding needs to be developed in the form of cross-border repo market and collateral management services so that EMs can enjoy stable funding without excess reliance on external sources. Instead of the current laissez faire approach about FX funding with its heavy reliance on foreign bank branches, EM banks should play a more proactive role in cross-border tri-party repo markets. Second, a set of inclusive and supervisory and regulatory efforts in EMs should be employed so that shock-absorbing capacities are strengthened in the region without relying on recurring policy efforts. Local and regional financial networks need to be developed further and secured for a more efficient international credit allocation. It remains the task for future studies to compare various collateral pools for better credit intermediation and other favorable effects on the real economy (Hrung & Seligman, 2011).

Among other factors, this paper argues that the lack of safe assets for the region as well as the inadequate market infrastructure for better mining and utilization of collateral pools remains the underlying cause for market underdevelopment and financial instability. Emerging economies justifiably have potentially safe assets

for use as collaterals but could not mine those for global use due to inherent difficulties. The absence of their own safe assets forces emerging markets to engage in herd behavior for treasuries with the overall financial system becomes increasingly shock-prone. And the current practice of hoarding safe assets per se has the inherent vulnerability that would show up in a tail-event situation. That is, emerging market economies' overall asset choices are hardly stabilizing since capital flows become polarized and unbalanced due to perennial heavy demand for safe assets, which itself can be destabilizing. In some instances, emerging economies have renewed supervisory efforts under the prevailing setting, practically thwarting traditional banking practices for corporate lending while exercising unexpected balloon effects in shadow and off-shore banking (Sheng, Edelmann, Hu, & Sheng, 2015). This is a case of good lesson that turns into a bad advice. That is, satisfying regulatory requirements would force banks to remain even more conservative, except for real estate collateralized lending. As a result, the pursuit of short-term financial stability actually leads to increasing polarization of an economy and a misallocation of credits.

In this paper, a modest proposal is formulated to overcome this problem. It specifically addresses the issue of lack of safe assets and the prevailing market mechanism that is predominantly dollar centric, which suppresses market incentives for interbank operations in the region. The rest of the paper is organized as follows: in the following chapter, this paper argues that lack of safe assets and the moribund repo market that would not utilize existing collateral pool in the region remains as the weakest link. Specifically, both issues related with the shortage of safe assets that can serve as collateral in repo transactions and the lack of underlying system to move collaterals across the border will be addressed. Some policy implications and suggestions to overcome this issue are made in the final chapter.

Rationale for a Regional Repo Market Development

Before addressing the importance of collateral in recent financial operations, it is time to recognize the crucial role of repo market regionally. This is because modern day funding that cannot miss out the role of nonbanks is increasingly market based and the only viable system is a dollar-centric system with fully operational money and interbank market. This reality makes the system more centralized since there are few alternative infrastructures and collateral bases in the region to rely on. Above all, it needs to be emphasized that prevailing market-based, collateral-driven funding practices in an increasingly integrated network environment require extensive use of safe assets as collaterals. For EM's economies, among other things, financial stability calls for a new set of collateral that can be made available in cross-border funding, which is currently disproportionately lacking in an EM setting. It also underscores the dominant position of a vehicle-currency country in an integrated financial system, whose network externality actually increases the overall systemic risk despite its pivotal role in maintaining short-term financial stability. The so-called flight to security or safety in a network environment where the only viable option is the dollar asset would lead to bad equilibrium because of the failure of systemic risk management. Given this reality, any future financial instability will exacerbate the EM's burden of securing enough safe assets via spillover channels (IMF, 2013). Simply put, it becomes especially burdensome for EME to secure stable funding when things turn bad because the network externality of prevailing system shuts off market access in the periphery.

Unfortunately, the regional capacity to produce safe assets for collateral is neither recognized nor identified as sources of trouble. In fact, the choices by EME after the global financial crisis have been passive adoption of new, yet complicated funding practices with increased use of swaps and derivatives. However, the end result is

a more integrated system where shocks move from the center to the periphery. As a result, the more integrated the financial system for EM's economies, the more pronounced the gap between the supply and demand for safe assets in the region. Unlike the vehicle-currency countries, any shock propagated in the system would predominantly require extra preparations for the FX liquidity provisioning in emerging economies, that is, extra buffer of margining requirements. As for the crucial FX liquidity requirements itself, emerging economies have neither the indigenous funding network nor the safe assets that can be used as collateral in cross-border nonbank funding practices. Among the overriding concerns, emerging economies particularly show that short-term stabilization efforts of EM's economies may result in even greater instability owing to the inherent lack of safe assets and the skewed portfolio that rely too much on "the existing pool of safe assets (US Treasuries)". Simply, the change calls for increased supply of safe assets from the region and the better utilization of added pool of collaterals via repo market. Without newly produced safe assets, prevailing risk management practices would not secure financial stability as the system becomes more integrated and systemic risks harder to control.

In a similar vein, applying global standards for risk management in an increasingly integrated environment with different financial systems actually leads to the build-up of systemic risks. As such, the so-called safety gears regarding capital base and liquidity requirements [e.g., NSFR (Net Stable Funding Ratio), LCR (liquidity coverage ratio)] are made less effective in guarding against crises. Despite the needs for global actions for systemic risk management, most of the stabilization efforts based on sovereign responses are actually fostering a more fragmented system in which risks are hard to monitor and even harder to control. And the endogenous EM's responses toward "flight to safety or security" result in an overstretched situation of the international monetary system due to its fragmentation. By now, it should be made clear that frequent dislocations of a newly developed funding market illustrate the fundamental need for an expanded sovereign collateral pool (Pozsar, 2011; Singh, 2014a; 2014b; Hordahl & King, 2008) for global financial stability. It also should be noted that the lack of collateral for nonbank credit intermediation is the result of an existing, stringent classification of collateral and partly explains the widening gap between the demand and supply for safe assets (Table 1). Run for the safety when there are few viable options that make everyone riskier.

The post-global financial crisis experiences clearly indicate that the increasingly market-based financing practices have placed an increasingly great burden on emerging market economies in the form of uncontrollable and unavoidable systemic risks. Given that EM's economies unilaterally rely on FX funding needs for stability purpose, changes in funding mechanisms place newly introduced risk exposures on EM's economies. Just as the securitized banking that led to the sub-prime crisis in the United States, most emerging economies have yet to realize the complex nature of risks involved in a newly developed funding scheme in repos and swaps, among others. Besides the cross-border issues, emerging market banks and authorities face a very uncomfortable situation in which risks can neither be monitored nor controlled with the increased use of derivatives of unrecognized counterparty risks. If the EM's situation is important for global financial stability, and if the sources of risk stem from changes in funding practices that are increasingly market based, a background of emerging markets with poor market support spells trouble going forward. Simply put, for emerging economies to achieve financial stability, its own repo market with its own collateral base needs to be installed to bring balance into a "capital flow uphill" global financial system. The situation needs to be corrected.

Extending the discussion in a global context further underscores the importance of a global repo network. The role of collateral based repo market in modern day financial system cannot be emphasized too much. Given the relative importance of collateral in increasingly secured funding practices globally, it is difficult to expect

smooth credit intermediation when sizable amounts of collateral are kept at the US Federal Reserve and EM central banks for QE related activities. The situation could get worse when tapering by the Federal Reserve actually begins to impact secured funding channels that remain closed to Asian emerging markets. Given the need for an increased supply of good collateral, and the current lack of preparation in EM's economies to meet this change, possible improvements can be expected via expanding the legitimate pool of collateral to include EM sovereign debts of good standing for cross-border repo transactions. Recognition of legitimate collateral pool would not require formal agreement among sovereigns, but a blessing of the global body for renewed market acceptance would be a big boost.

In practice, the most practical way to overcome this problem is to expand on the collateral pool by updating the Eligible Collateral Criteria (ECB, 2014a). As explained, the increasing importance of collateral in modern day finance is related to the shortage of safe assets, where Asia does not perform its fair share of producing quality safe assets of international acceptance (Caballero & Krishnamurthy, 2009). While the credit intermediation increasingly relies on collateral, this under-provisioning of necessary ingredients makes EM Asia more reliant on the outsourcing of its financial system. The importance of collateral as safe assets has been previously noted in the singular success of the TSLF (Term Securities Lending Facility) after the recent crisis (Hrung & Seligman, 2011). The stabilizing effects of the TSLF symbolize the importance of safe assets against the backdrop of nonbank secured funding markets which are now called as shadow banks. As such, safe assets are a key source of liquid, stable collateral in private and central bank repo agreements and in derivatives markets. They perform as the lubricant, benchmark, or substitute of trust in most financial transactions (IMF, 2012). In previous studies, Gorton and Ordonez (2013) explained that there is a demand for safe assets, either government bonds or private substitutes, for use as collateral. However, only US Treasuries qualify for de facto safe assets, creating the gap between the supply and demand for safe assets.

Further, the private sector cannot produce risk-free collateral to satisfy the growing demands for safe assets and the economy remains fragile to the extent that the gap persists. It is no wonder that government bonds virtually replace private assets during crisis for renewed confidence. The purported story about safe asset shortage stems from the reality that the supply of treasuries is bound to be limited and there are fewer equivalents available in the market as the Federal Reserve has kept a sizable share under its balance sheet. Currently, there are no viable suppliers of collateral in the global repo market. This gap can be indirectly measured as changes in collateral velocity or a broad definition of money multiplier (Singh, 2014a). Simply, the collateral shortage would be associated with declining collateral velocity or shrinking money multiplier. And larger swings in this ratio also mean a loss of stability in the use of private vs. public collateral. Even though concrete numbers will be further examined in follow-up studies, continue to indicate the growing role of collateral in nonbank operations. To restore balance in the supply and demand for collateral, there needs some extra supply of legitimate collateral, which can only come from Asia.

In a related context, Krishnamurthy and Vissing-Jorgensen (2012) showed that the net supply of government debt is strongly negatively correlated with the net supply of private risk-free debt. Given this correlation between two classes of bonds, changes in the supply of outstanding treasuries have significant effects on the yields of privately created assets. Gorton, Lewellen, and Metrick (2012) also documented that the share of safe assets in the United States, in fact, remained almost constant as a percentage of all US assets since 1952 even though the extra scan of collateral velocity, as well as multipliers, reflects the increasingly important role of collateral in the credit cycle (Singh, 2014b). Instability in "safe asset share" implies a near crisis and

underscores the importance of providing balanced collateral pools to avoid excessive swings in the ratio. That is, the ratio itself, as well as the relative contribution by private vs. public, is also important for financial stability. In this vein, the EM-produced bonds can be legitimately used as supplementary collateral, potentially relaxing borrowing restrictions for many firms. In short, repo market provides background for collateral supply and utilization, which is a backdrop for maintaining proper level of safe assets for financial stability.

Table 1

Simple Classification of Collateral by Type and Collateralized Market

<table>
<tr><th colspan="2">Type of security</th><th>Repo</th><th>Securities lending</th><th>Collateralization of derivatives</th></tr>
<tr><td colspan="2">Cash</td><td>N/A</td><td>From 25% in Europe to 80%-95% in US and 97% in Japan</td><td>Predominant</td></tr>
<tr><td colspan="2">Letters of credit</td><td>No</td><td>US</td><td>No</td></tr>
<tr><td colspan="2">Government bonds</td><td>81% in Europe,
57% or less in US</td><td>Predominant form of non-cash collateral but limited to high quality issuers and excluding non-OECD</td><td>Predominant but limited to high quality issuers and excluding non-OECD</td></tr>
<tr><td rowspan="3">High grade</td><td>Sovereign</td><td rowspan="3">Less than 5% in Europe,
5% in US</td><td rowspan="3">65%-70%</td><td rowspan="15"></td></tr>
<tr><td>Supranational</td></tr>
<tr><td>Agency</td></tr>
<tr><td rowspan="12">Credit</td><td>Equity</td><td>Less than 5%</td><td>25%-30%</td></tr>
<tr><td>IG non-financial institutions</td><td rowspan="2">Less than 5%</td><td>5%</td></tr>
<tr><td>IG financial institutions</td><td rowspan="11">Little or no use as collateral</td></tr>
<tr><td>Covered bonds</td><td>Less than 10%</td></tr>
<tr><td>RMBS</td><td rowspan="2">Less than 5% in Europe,
29% in US</td></tr>
<tr><td>CMBS</td></tr>
<tr><td>ABS</td><td>Less than 1%</td></tr>
<tr><td>CDO, CLO, CLN, etc.</td><td>Less than 1%</td></tr>
<tr><td>Money market</td><td>Less than 1%</td></tr>
<tr><td>High yield</td><td>No</td></tr>
<tr><td>ETF & other funds</td><td>No</td></tr>
<tr><td>Credit claims</td><td>Less than 1%</td></tr>
</table>

Notes. European repo data are from ICMA European repo market survey for December 2012 and US data are from the FRBNY for primary dealers (www.newyorkfed.org/markets/primarydealers.html). “Sovereign” means government securities issued in foreign currency. IG means investment grade (BBB- or above). Source: European Parliament (2013).

Ways to Overcome Shortage of Safe Assets: Better Use of Collaterals in Cross-border Repo Markets (Pump vs. Plumbing)

Drawing upon previous studies on regional cooperation, three aspects of future actions are emphasized as a possible venue for remedial actions:

First, it should be a region-wide effort since necessary elements for currency internationalization cannot be satisfied based on the sovereignty-driven efforts. And an individualistic approach would cause spillovers and would require enormous resources that cannot be made available on a time-consistent basis (Choi, 2014).

Second, it should be the market-driven, not policy-led environment to secure a foothold for active participation of new private entities such as asset managers, broker-dealers, pension, insurance, hedge funds, and clearing and settlement services. The world is saddled with enough of an adjustment burden borne by national authorities, and further intervention would lead to stumbling blocks with no resolution in sight. It is

true that privately created issues have often resulted in an excessive role for the public sector, but it is important to restore balance in the financial eco-system to secure grounds for global financial stability and sustainable growth. The pivotal role of private market participants in a well-functioning market remains the core function for financial stability. Yet, pendulums of changing market perception have swung too much. A completely different picture is observed after the GFC (IMF, 2012). The private liquidity provision basically evaporated after the GFC, resulting in enormous cash pools of several corporations and asset management companies (Table 2). Given the fragile nature of regional governance that is often bureaucratic, a concrete market-driven agenda needs to be invigorated as a top priority to avoid excessive swings.

Table 2

Corporate Cash Holding (US, Korea)

Top five company of Korea	Cash holding (trillion won, 2014Q1)	Top five company of US	Cash holding (billion dollar, 2015Q2)
Samsung	182.4	Microsoft	96.5
Hyundai Motors	113.9	Google	69.8
SK	58.5	Cisco system	60.4
LG	49.6	Oracle	54.4
POSCO	44.5	Apple	34.7

Source: CEOscore, FactSet.

Third, the efforts to address current issues are essentially related to the reform agenda of the international monetary and financial system. That is, the current system needs reform to better handle nonbank, collateralized credit intermediation by fully recognizing the nexus between banks and nonbanks. It should be able to provide balanced collateral pools by recognizing the systemic importance of repo markets in shadow banking (Gorton & Metrick, 2010). And, any impetus for global rebalancing and stable cross-border capital flow needs full-fledged global support, for example, the Group of 20, because boosting a regional capacity for collateral supply is essentially a focal agenda of the impending global financial system upgrade.

Owing to its inherent feature that requires minimum collateral for transactions, the repo remains the core component of today's financial ecosystem. As stressed, basic solution starts from developing a regional repo market and strengthening the collateral management services in Asia. By accepting legitimate sovereign collateral first, emerging economies of periphery countries can enjoy stable FX funding without generating further capital flows uphill that would jeopardize the international monetary system. The following sketches possible course of actions.

Pump Activities (Supply of Collateral)

Building on these requirements, future action plans need to concentrate on developing regional repo markets as a basis for creating the market demand for Asian collateral. First, as observed, EM's economies need a stable FX funding source other than via FX reserves, swap arrangements, and other facilities. That is, emerging market economies badly need their own financial market infrastructure for market-based stable funding. Second, repo markets are good preparation for the future regulatory changes that emphasize "secured lending". Asian economies should be able to secure enough FX funding via its own market operations without excess reliance on foreign banks to do the job instead. It is also desirable to secure funding facilities that would not interfere with a set of prudential guidelines. In fact, secured funding based on collateral is the forward-looking, superior choice given the stricter Basel III directives against unsecured funding exercises (BCBS, 2013). Third, Asian emerging market economies already have enough good collateral to help them

engage in stable funding without being subject to wide market swings of narrowly defined existing collateral pools. Unlike the US and European repo markets, however, Asia's repo presence is still quite minimal (Table 3). In fact, the world economy badly needs good collateral pools for better collateral pricing, and balanced credit intermediation, which practically narrows down the choice for collateral mines (Pozsar, Adrian, Ashcraft, & Boesky, 2010; Pozsar, 2011) to Asia. To sum it up, the regional collaterals can be created and utilized in an extended regional repo framework. And this needs a high priority agenda for countries in Asia.

Table 3

Repo-to-GDP Ratio in the United States (in Billions of US Dollars and Percent)

Year	Repo year	Rev. repo year	Total year	GDPUS (millions)	Total year/GDPUS
1996	245	182	426	8,100	53
1997	291	222	513	8,609	60
1998	355	279	634	9,089	70
1999	340	268	608	9,666	63
2000	361	274	636	10,290	62
2001	448	329	777	10,625	73
2002	546	405	951	10,980	87
2003	589	422	1,011	11,512	88
2004	719	521	1,239	12,277	101
2005	825	591	1,416	13,095	108
2006	847	556	1,403	13,858	101
2007	973	622	1,595	14,480	110
2008	985	653	1,638	14,720	111
2009	645	459	1,104	14,418	77
2010	663	518	1,181	14,958	79
2011	689	549	1,238	15,534	80
2012	686	541	1,226	16,245	76
2013	666	501	1,167	16,800	70

Sources: Securities Industry and Financial Markets Association (SIFMA) and World Bank Indicators.

At present, the only viable option is to broaden the base of collateral by expanding the current classification to include Asian sovereign debt. By accepting Asian sovereign collateral in the repo market, the gap can be narrowed and there would be enough collateral base to run the system. As a matter of practical choice, it is important that market-based funding activities, for example, repos, start accepting EM's government bonds as legitimate collateral. There are flexible market adjustment mechanism, e.g. haircuts or margin requirements, to accommodate possible pricing difficulties at the outset. It would help emerging markets to overcome the initial hurdle of a recognition gap in laying the foundation for future market development. Given the classification (Table 4), only JGB is treated as valid collateral for repo, and most Euro bonds, including crisis countries, still remain legitimate collateral. This hardly sits well with the reality as well as credit ratings by major agencies (Table 5). Also, further inclusion of sovereign debts as legitimate collateral would allow Asia to utilize the improved version of today's wholesale funding to better manage risks in an increasingly integrated environment. That is, the market-based, demand-driven incentives need to be activated to start a virtuous cycle that will eventually help EM Asia secure basic requirements for financial stability. This two-pronged, collateral-based, supply, and demand approach would pave the way to develop financial markets in Asia and it can start with reforming the eligibility criteria for legitimate collaterals.

Table 4

Central Bank Collateral Eligibility Requirements

	I	II	III	IV	V
ECB	- Central government - Debt instruments - Debt instruments issued by NCBs	- Local and regional government debt; Jumbo covered bonds - Agency debt instruments - Supranational debt instruments	- Traditional covered bank bonds - Debt instruments issued by non-financial corporations and other issuers - Other covered bank bonds	- Credit institution debt instruments (unsecured) - Debt instruments issued by financial corporations other than credit institutions (unsecured)	- Asset-backed securities
BoE	- Sovereign and central bank debt (including associated strips) of 22 countries (UK, Canada, France, and so on)	- Bonds issued by G10 government agencies - Conventional debt issued by Freddie Mac and Fannie Mae - Sterling, euro and US dollar denominated securities issued by major international institutions	- Covered bonds. The underlying assets may be either UK or EEA public sector debt - UK and EEA residential mortgage-backed securities (RMBS). - UK, US, and EEA securitized portfolios	- Credit institution debt instruments (unsecured) - Debt instruments issued by financial corporations other than credit institutions (unsecured)	- UK, US, and EEA asset-backed securities (ABS) backed by credit cards
Fed	- US Treasuries fully guaranteed agencies - Foreign government guaranteed - Brady bonds	- Government sponsored enterprises - Foreign government agencies - Supra-nationals - German jumbo-Pfandbriefe - Municipal bonds - Agency-backed mortgages	- Corporate bonds - Covered bonds - Commercial mortgage backed securities (AAA rated)	- Certificate of deposit - Bankers' acceptances - Commercial paper Asset-backed - Commercial paper - Corporate bonds	- Asset-backed securities) - Collateralized debt obligations-AAA - Trust preferred securities Private label CMOs
Sveriges Bank	- Secured issued by central governments - Securities issued by central banks - Other claims on central banks	- Securities issued by international organizations - Securities guaranteed by central governments - Securities issued or guaranteed by local governments or authorities abroad - Securities issued by so- called agencies	- Covered securities	- Other eligible securities	- Asset-backed securities
BoJ	- Government bonds (excluding floating-rate bonds, STRIPS, inflation indexed bonds, and treasury bills) - STRIPS - Foreign government bonds	- Government-guaranteed bonds - Government-guaranteed dematerialized commercial paper - Municipal bonds - Fiscal Investment and Loan Program (FILP) agency bonds	- Corporate bonds - Dematerialized commercial paper issued by domestic corporations - Dematerialized commercial paper issued by foreign corporations with guarantees - Bills drawn by companies	- Bonds issued by real estate investment corporations - Dematerialized commercial paper issued by real estate investment corporations - International financial institution bonds - Bills drawn by real estate investment corporations	- Asset-backed securities
SNB	No distinction is made by asset class				- Asset-backed securities

Source: ECB (2014a).

Table 5

Sovereign Ratings (Long-term, Sep. 5, 2014)

	Foreign currency			Local currency		
	Moody's	S&P	Fitch	Moody's	S&P	Fitch
Advanced economies						
United States	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa
United Kingdom	Aa1	Aa1	Aa1	Aa1	Aa1	Aa1
Japan	Aa3	Aa3	Aa3	Aa3	Aa3	Aa3
Germany	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa
France	Aa1	Aa1	Aa1	Aa1	Aa1	Aa1
Italy	Baa2	Baa2	Baa2	Baa2	Baa2	Baa2
Portugal	Ba1	Ba1	Ba1	Ba1	Ba1	Ba1
Spain	Baa2	Baa2	Baa2	Baa2	Baa2	Baa2
Emerging markets						
Brazil	Baa2	BBB-	BBB	Baa2	BBB+	BBB
Chile	Aa3	AA-	A+	Aa3	AA+	AA-
China	Aa3	AA-	A+	Aa3	AA-	A+
Colombia	Baa2	BBB	BBB	Baa2	BBB+	BBB+
Czech Republic	A1	AA-	A+	A1	AA	AA-
Hong Kong SAR	Aa1	AAA	AA+	Aa1	AAA	AA+
India	Baa3	BBB-u	BBB-	Baa3	BBB-u	BBB-
Indonesia	Baa3	BB+	BBB-	Baa3	BB+	BBB-
Korea	Aa3	A+	AA-	Aa3	AA-	AA
Malaysia	A3	A-	A-	A3	A	A
Mexico	A3	BBB+	BBB+	A3	A	A-
Nigeria	Ba3	BB-	BB-	Ba3	BB-	BB
Peru	A3	BBB+	BBB+	A3	A-	A-
Philippines	Baa3	BBB	BBB-	Baa3	BBB	BBB
Poland	A2	A-	A-	A2	A	A
Russia	Baa1	BBB-	BBB	Baa1	BBB	BBB
Singapore	Aaa	AAAu	AAA	Aaa	AAAu	AAA
South Africa	Baa1	BBB-	BBB	Baa1	BBB+	BBB+
Thailand	Baa1	BBB+	BBB+	Baa1	A-	A-
Uruguay	Baa2	BBB-	BBB-	Baa2	BBB-	BBB

Source: Bloomberg L. P.

The private creation of credits also underscores the importance of a broader measure of money and credit than M2. Again, given the growing gap as implied by the declining velocity (Singh, 2014a; 2014b), the current collateral constraints need to include new assets from Asia in the collateral pools. By a broad measure, sovereign collateral from A3 (China, Japan, and Korea) can rightly serve as a prime candidate for legitimate collateral, especially for expanded and smoother repo transactions (Table 5). It is somewhat mysterious that, given a shortage of government bonds, and a heavier reliance on privately produced safe assets, Asian sovereign bonds are still excluded from the collateral pool for repo transactions. If Asian bonds are proven repo-compatible, the global financial system will run more smoothly because unbalanced factors (an excessive burden on dollars and dollar assets) can be better controlled.

To make some progress in this category, the first step toward market development would be the acceptance of sovereign bonds as legitimate collateral for bilateral and tri-party repo transactions. Recently, the

Hong Kong Monetary Authority (HKMA) launched an initiative to include some sovereign bonds of EM's economies. By exposing sovereign bonds to variable haircuts and margining requirements, market pressures can be better utilized to build the necessary market infrastructure in emerging economies (Tables 6 and 7).

Table 6

US Tri-party Repo Haircut Statistics (in Percent)

Asset group	Cash investor margin levels		
	10th percentile	Median	90th percentile
ABS (investment & noninvestment grade)	5.00	7.00	15.00
Agency CMOs	2.00	3.00	7.00
Agency debentures & strips	2.00	2.00	3.00
Agency MBS	2.00	2.00	3.00
CMO private label (investment & noninvestment grade)	3.00	8.00	18.40
Corporates investment grade	3.00	5.00	10.00
Corporates noninvestment grade	3.00	8.00	16.30
Equities	5.00	8.00	15.00
Municipality debt	0.00	5.00	10.00
US Treasuries strips	2.00	2.00	2.20
US Treasuries excluding strips	2.00	2.00	2.00

Source: Federal Reserve Bank of New York (May 9, 2013).

Table 7

Typical Haircut on Term Securities Financing Transactions

	2007. 6			2009. 6		
	Prime counterparty	Non-prime counterparty	Hedge funds and other unrated counterparties	Prime counterparty	Non-prime counterparty	Hedge funds and other unrated counterparties
G7 government bond						
Short-term	0	0	0.5	0.5	1	2
Medium-term	0	0	0.5	1	2	3
US agencies						
Short-term	1	2	3	1	2	3
Medium-term	1	2	3	2	5	7
Pfandbrief	0	0	1	1	2	8
Prime MBS						
AAA-rated	4	6	10	10	20	30-100
AA-and A-rated	8	12	25	100	100	100
Asset-backed securities	10	20	20	25	50	100
Structured products (AAA)	10	15	20	100	100	100
Investment grade bond						
AAA-and AA-rated	1	2	5	8	12	15
A-and BBB-rated	4	7	10	10	15	20
High-yield bonds	8	12	20	15	20	40
Equity						
G7 countries	10	12	20	15	20	25
Emerging economies	15	20	35	20	25	40

Source: CGFS (2010).

All in all, there are ample reasons to expand the safe asset categories by exposing and introducing sovereign collaterals under the market scrutiny instead of adhering to a narrowly defined safe asset category of the UST. As such, it is important that the potential role of Asian assets in filling the gap needs to be further analyzed. It happens that the shortage is most acute in the nonbank-secured funding market arranged by nonbanks. Therefore, an expanded pool of collateral fed into the repo market would directly impact one of the underlying causes of financial instability. That is, enhanced recognition of sovereign collateral from Asia in the cross-border repo market, irrespective of the features, for example, tri-party repo or bilateral repo, would ease the current frictions and help grease the modern wheels of credit creation.

The choice of repo market vis-a-vis alternatives, such as the outright internationalization of a currency, stems from the initial lack of confidence among market participants. This basically precludes any successful internationalization move by the regional EM authorities. The repo market, by definition, does not require full-fledged market confidence since repo means its own confidence and serves as the basis of collateral value. Given that the current classification of collateral assets excludes Asian government bonds, with the possible exception of JGB, an inclusive reclassification of eligible collateral pools would qualify most of the EM's government bonds (European Parliament, 2013). Accordingly, an initiative to develop a regional repo market in Asia would help usher in a new supply of safe assets with minimal efforts of international recognition by the G-20. It is ironic that the current collateral shortage remains unchecked in parallel with the absence of legitimate EM sovereign collateral (Table 1). It is noted that some of the preconditions for legitimate collateral can also be satisfied using the resources of international financial institutions (IFIs), if additional credit enhancements or backups become necessary. Above all, broad-based collateral assets would provide a stable foundation for credit creation and more balanced allocation. More balanced credit flows can help boost investment and growth potential. Greasing the wheels of a more balanced financial system via an increased supply of safe assets to serve as collateral would be a worldwide improvement (Table 8).

Table 8

Size of EMEAP Repo Markets (Repos Outstanding at End 2013)

	As a percentage of bonds outstanding	As a percentage of bonds outstanding (excluding central bank repo)
UK	43.5*	42.6*
USA	16.646	16.4
Australia	18.6	14
China	10.5*	10.5*
Indonesia	0.4	0
Japan	15.2	15.2
Korea	11.3	9.9
Malaysia	3.1	1
New Zealand	0.9	0.6
Philippines	7.9	0.1
Singapore	10.1	1.8
Thailand	18.6	7.2

Note. * As at end 2012. Source: EMEAP (2014).

Plumbing (Collateral Velocity)

In addition to further excavation of legitimate collateral pool from Asia, there needs a system to mobilize this extra pool. The practical road map to develop the repo market has been prepared and implemented by the

HKMA with some success, but the drive needs to be expanded into a regional effort that utilizes treasury-equivalent regional collateral (Figures 1 and 2). Additional necessary support can be supplied by international organizations (e.g., IMF and other global players) for collateral management, guarantees, and securitization. In addition to the engagements by the IFIs, clearing and settlement facilities need to be sourced out to existing players, e.g. Euroclear, Clearstream, JP Morgan, and NY Mellon, etc., which will eventually be joined by regional facilities in due course. Given the current lack of adequate infrastructure in the region, their participation in the regional repo market is vital. Also, more attractive incentive packages to attract more EM's sovereign collateral pool, i.e., flexible haircut and margin requirements as market based safety devices, need to be strengthened further. Possibly, some kinds of insurance, e.g. CDS (Credit Default Swap), for market dislocation of EM, collaterals also need to be developed.

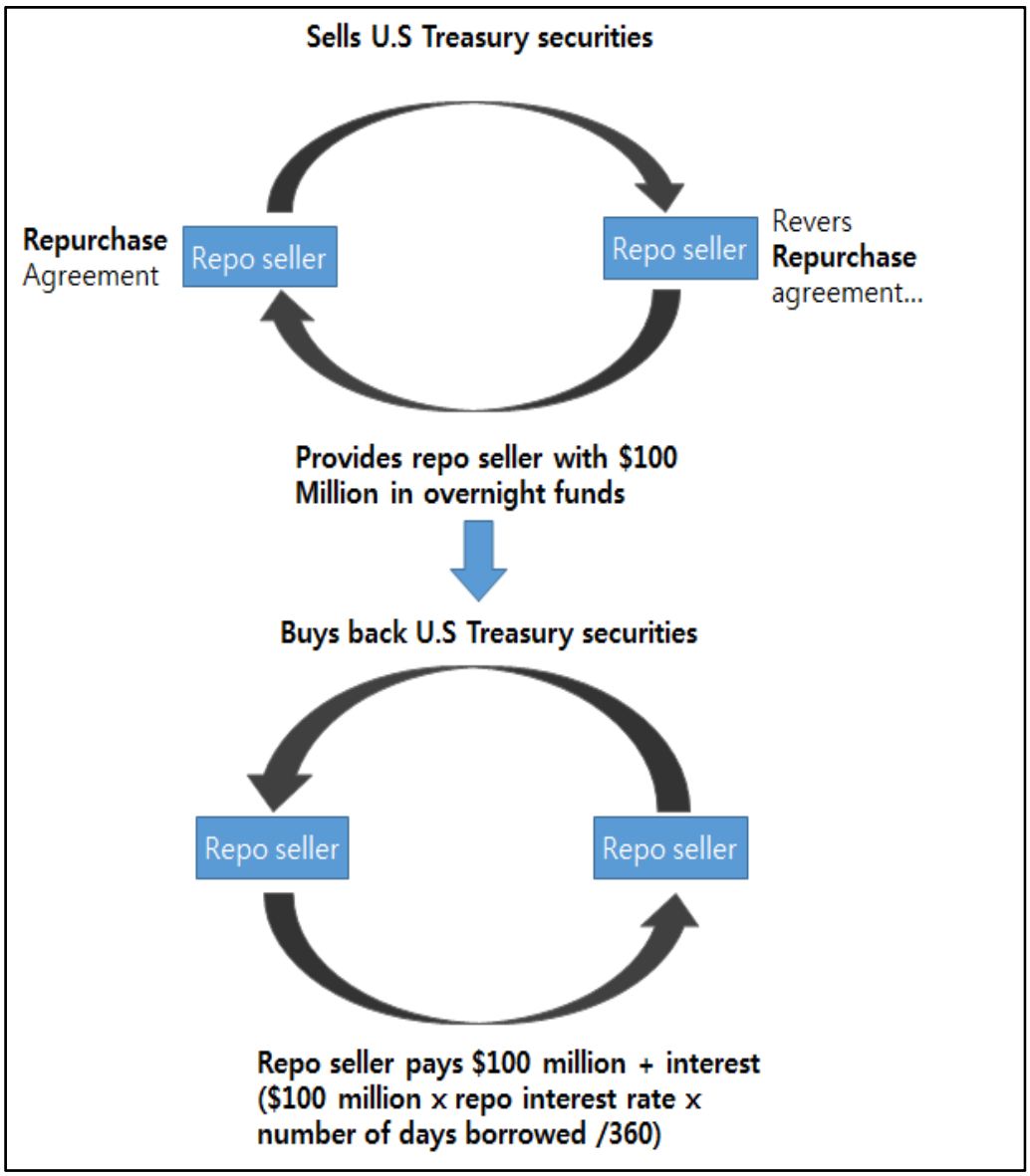

Figure 1. A schematic of an example of a repo transaction. Source: Securities Industry and Financial Markets Association.

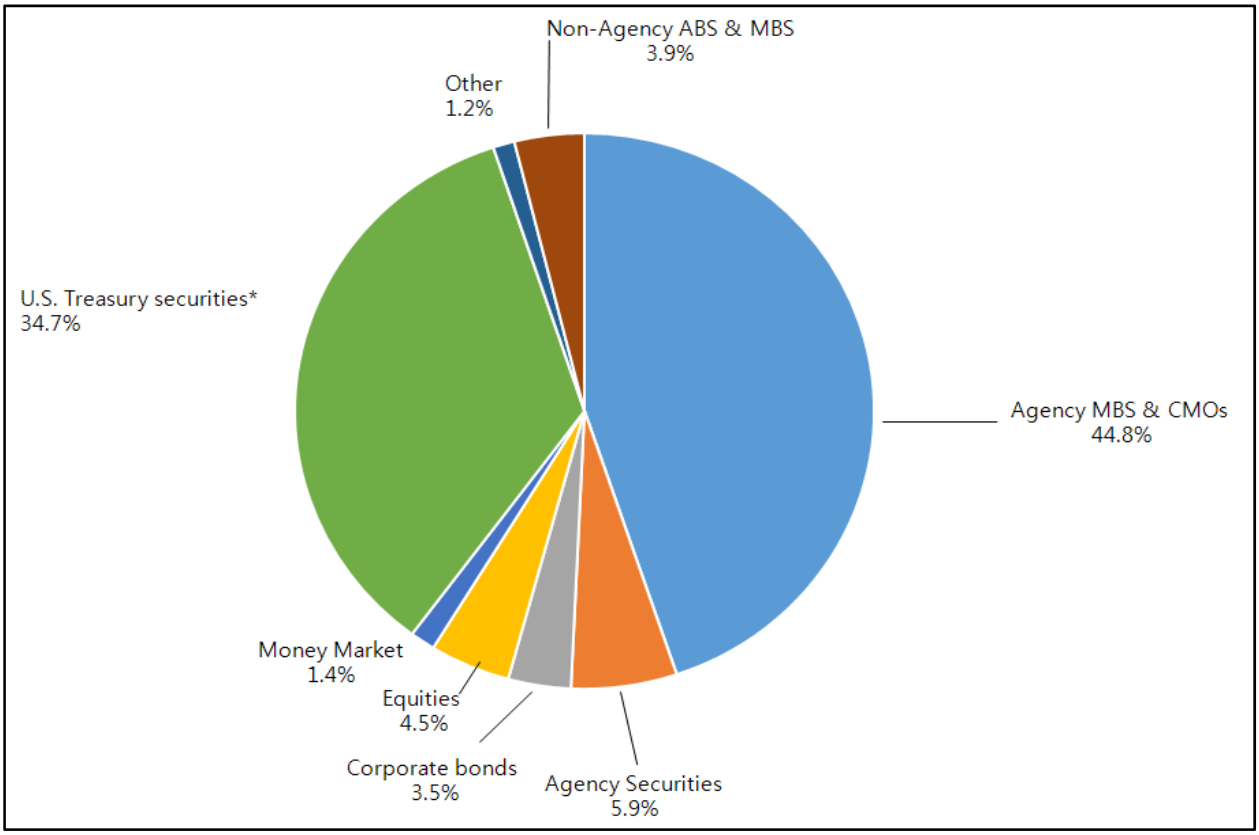

Figure 2. The breakdown of the most common types of collateral used in the US tri-party repo market. Source: Federal Reserve Bank of New York, most common collateral used, as percentage of total (July 11, 2012).

Also, regional repo markets can be developed without the arduous task of securing conditions for bond market development in the region. It is also suggested that commercially available market instruments denoted in a common currency index, for example, EM-indexed CDO or covered bond, can also be circulated even without explicit government-level cooperation. That is, an initial repo market can start with an existing pool of sovereign collateral even without introducing a common index. As emphasized, the precondition is the acceptance of a new class of sovereign assets for collateral in a growing network of global repo markets. Here, the European situation needs to be compared: only well-qualified assets are introduced as collateral in repos as a market primer to enhance public recognition. All in all, this market-initiated possibility is the most relevant choice to enhance global financial stability globally. Garnering an initially positive market response and embracing the support of IFIs would also help overcome early problems in securing a foothold for financial stability.

Expected Outcome

The suggested concrete steps would help reverse the ironic vicious cycle of heading toward eventual tail events even with the best policy efforts. This effort also resonates well with the reform needs of the current international monetary system. It should be noted that the US Federal Reserve cannot yet release collateral it absorbed during the GFC via QE. And the resulting lack of good collateral to grease the financial wheel can only be secured by introducing repo-able collateral from Asia. The latter would be fed into the existing machinery, notably hedge fund equivalents in the US-centric system. A changed system should better utilize collateral, e.g., higher collateral velocity proposed by Singh (2014a) (Figure 3), even though practices on

rehypothecation vary across regions. It is practically infeasible to expect smooth credit flows when the nexus between banks and nonbanks remains clogged. A well-functioning repo market would resolve the issue of financial plumbing because it is less dependent on strict requirements of reserve currencies. In fact, Asia holds the key to overcome current problems in international finance.

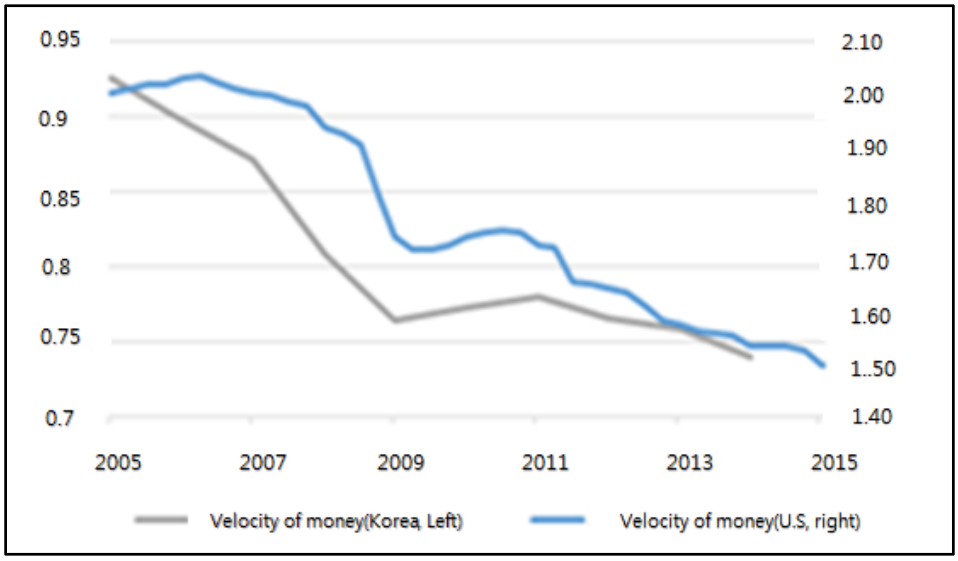

Figure 3. The velocity of money (US, Korea). Source: BOK, FRB.

A regional repo market initiative would, therefore, have the following benefits. First, it would help stabilize the dollar's vehicle-currency status by relieving the excess burden as a sole reserve currency, especially in a hierarchical network environment in which most EM's economies operate. Increasing the supply of safe assets using a type of index and expanding the collateral pool for the nonbank-intermediated credit supply (Singh, 2014b) would enhance financial stability. Simply, an expanded pool of collateral would ease the pressure off the haircuts and margins when market conditions vary. Second, the use of a common index can serve as a backbone for a new reserve currency, and can be easily accepted in the market when appropriate institutions back up the provision and circulation of the newly proposed asset. That is, Asia needs to start experimenting with financial assets denominated with a common index. Also, the new asset needs to be given full status as valid collateral in the current dealer-based credit intermediation process. Any participants should be able to borrow using EM's bonds as collateral. Or Asia can begin using its existing sovereign debt as valid collateral for repo transactions.

All in all, a regional repo market based on expanded collateral pools from emerging markets would help decentralize the excessive loadings on the current system that only accepts a pool of narrowly defined collateral. Without scrambling for the treasuries, EM Asia can start utilizing its own collateral pools to secure stable FX funding in a newly developed market. While previous Asian bond initiatives failed to attain enough market demand among current account surplus countries, the use of bonds for collateral purposes in repo transactions or securities lending is both practical and relevant in a global context. It would help emerging markets to overcome the situation whereby they cannot utilize their enormous pool of collateral for financial transactions because of restrictive classification and lack of proper machinery.

Summary and Conclusion

In conclusion, increasing the supply of new safe assets for collateral pool as well as enhancing the circulation of collateral across different jurisdictions would be necessary to make the money go around. This is a belated realization after decades of stabilization efforts under the existing “international monetary system”. As explained, the fundamental changes in the way firms engage in FX funding have contributed to the renewed importance of safe assets in repo market. The changed environment highlights the diverse sources of risks in an integrated “global financial system”, which exposes different shock propagation channel that emerging economies find it very difficult to contain (ECB, 2014b). Developments in wholesale funding markets during financial turmoil illustrate the fragility of unsecured interbank markets, and the excessive requirements for the highest-quality collateral in the US tri-party repo market imply very limited scope for future preparation for EME to attain financial stability. Given that the source of financial instability in the region stems from the lack of financial infrastructures to allow safe assets to perform its function, e.g. via repo market, EMEs should make direct efforts to address underlying causes of financial instability instead of strengthening conventional policy measures.

Increased hoarding would not ensure financial stability, while increased velocity would ease financial frictions. Essentially, the limitations of old policy tools and increasing integrated nature of global financial system underscore the need for a more inclusive reform of the international monetary system (Copeland, Duffie, Martin, & McLaughlin, 2014) that includes better utilization of existing pool of safe assets as well as increased supply of safe assets from the region. Given the dire needs for financial foothold in the region, developing regional repo market would be a first step toward a more balanced global financial system. Especially, given the geopolitical constraints, developing a regional repo market in Asia is the only viable option to take care of long-term rebalancing needs via market development as well as mitigating financial instabilities caused by increasingly collateral-based integration of the dollar-centric international monetary system.

This paper also points out that some of the EM’s assets can be used for credit intermediation by allowing an expanded pool of qualified EM’s collateral assets to be used in cross-border repo markets. It singularly emphasizes the need to include Asian (A3) sovereign collateral. A more natural evolution of the global financial system can be expected by strengthening the nexus between bank and nonbank activities via expanding the collaterals for repo transactions. The enhanced recognition of EM’s sovereign bonds in international repo transactions would also help overcome recognition barriers associated with the original sin (Eichengreen, Hausmann, & Panizza, 2003). By addressing the concerns for stable FX funding, regulatory requirements, and the need for capital market development in Asia, cross-border repo based on newly introduced EM sovereign collateral would be proven effective. Simple and renewed recognition of repo collateral assets would usher in an era of better credit supply and intermediation. Also, initial and sometimes weak conditions for market development in emerging economies can be overcome to lay the foundation for sustainable global financial stability.

To increase the supply of safe assets that global markets need without incurring unnecessary problems, a better utilization of a collateral pool from Asia is necessary. An increase in collateral velocity is no longer a viable option for emerging economies, because US Treasuries remain as the ultimate safe assets globally in a dynamic game setting. A new category of safe assets originated in Asia would also expand the choices of asset management and help EMs to secure stable FX liquidity in favor of ad hoc arrangements via the public sectors.

Instead of dealing with shadow banking with a flurry of regulations, it is important to make the money flow in a smoother manner by expanding the legitimate collateral base that includes public bonds other than treasuries in repo financing. Specifically, international monetary system reform efforts can start with a broader definition of legitimate collateral assets that can be used in repo transactions.

If efforts in this direction are not activated, the global choice would be narrowed down to extreme choices: full dollarization with even greater volatility in emerging markets or increasingly segmented markets with less trade. What could have been achieved with the ultimate introduction of sovereign bonds or a common index denominated in financial assets would be replaced with a drastic disintegration of the existing financial network and an even bigger presence of shadow banking. A better understanding of this situation is direly required to promote positive international action. Suggestions to narrow the gap between the supply and demand for safe assets include using EM's sovereign bonds as valid collateral for the nonbank-intermediated credit supply in repo markets. Policy suggestions also include a road map to increase the supply of safe assets that are denominated in currencies other than dollar into a newly developed regional repo market. Actions can immediately start with a broader recognition of legitimate collateral used in nonbank-intermediated credit channels. For instance, the current off-shore initiatives and internationalization drive need to be further developed into a broader framework to promote regional repo markets in Asia.

In conclusion, Asian emerging markets' increasing dependency on a narrowly defined international monetary system does not augur well for the global financial stability. To achieve better equilibrium, Asia needs a regional repo market that makes better use of silo-ed US Treasuries and its sovereign collateral pools for stable FX funding to contribute to stability in a network environment. It also would allow Asian emerging markets to develop their own financial markets, increasing their growth potential with resulting worldwide benefits.

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