

# INTERNATIONAL MONETARY FUND

## **Enhancing International Monetary Stability—A Role for the SDR?**

Prepared by the Strategy, Policy, and Review Department

In collaboration with the Finance, Legal, Monetary and Capital Markets Departments, and in consultation with the Research and Area Departments

Approved by Reza Moghadam

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### **Overview**

- ❖ The SDR has enjoyed renewed attention lately in the context of debates on international monetary reform. To be sure, the term SDR has been used to refer to three different concepts—(i) a composite reserve asset created in 1969: the “official SDR” as defined in the Fund’s Articles; (ii) a potential new class of reserve assets: tradable SDR-denominated securities issued by the Fund or an investment vehicle backed by a subset of the Fund’s membership; and (iii) a unit of account, which could be used to price internationally traded assets (e.g., sovereign bonds) and goods (e.g., commodities), to peg currencies, and to report balance of payments data. All three are discussed here.
- ❖ In these different roles, the SDR might help serve respectively the following objectives: reducing the extent and costs of international reserve accumulation; augmenting the supply of safe global assets and facilitating diversification; and reducing the impact of exchange rate volatility among major currencies. Expanding the SDR basket to major emerging market currencies presents trade-offs, but could further support these objectives.
- ❖ In order to make a difference in any of these areas, the role played by the SDR would need to be enhanced considerably from its current insignificant level. Very significant practical, political, and legal hurdles would need to be overcome in the process. Given the potential benefits however, experimental steps along the lines outlined here could be considered in the years ahead. In this spirit, the paper open-mindedly puts forward a broad range of options for debate. As the international community comes to a firmer view on the SDR’s potential role, the most promising options could be assessed further.
- ❖ Clearly, problems in the international monetary system (IMS)—persistent global imbalances, large and volatile capital flows, exchange rate gyrations disconnected from fundamentals, insufficient supply of safe global assets—are complex and call for an array of remedies—global policy collaboration and stronger surveillance, enhanced systemic financial safety net, financial deepening in emerging markets and more generally development of new reserve assets. The issue is whether there is a helpful role to play for the SDR amid these solutions. This paper suggests there might be.

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## I. WHY ENHANCE THE ROLE OF THE SDR?<sup>1</sup>

1. *Why the SDR?*<sup>2</sup> The IMS has demonstrated resilience through the various stages of recent crisis and the role of the U.S. dollar as a safe haven has also been confirmed, suggesting it can be expected to remain the most important global reserve currency for the foreseeable future. However, as emphasized recently by the IMFC and G20, and previously noted by the Executive Board, the current international monetary system (IMS) suffers from a range of problems, which have been detailed in earlier Fund work on reserve accumulation and the stability of the international monetary system (IMF, 2010f); and more recently in the context of examining the Fund's role regarding cross-border capital flows (IMF, 2010i).<sup>3</sup> The SDR may have some potential to improve the functioning of the IMS in three mutually reinforcing ways: as a sui generis composite reserve asset defined by the Fund's Articles and centrally allocated; as a unit of account; and, as a new reserve-grade security issued by the IMF or a subset of its membership (SDR-bond). Expanding the SDR basket would further support the SDR's role. More specifically, enhancing the role of the SDR could serve the following objectives:

- *Reduce reserve accumulation/imbalance and strengthen the global safety net:* Official SDR allocations are a lower cost alternative to accumulation of international reserves through borrowing or accumulation of current account surpluses. The SDR has the same properties as a swap line in that it allows holders access to foreign currency liquidity. SDRs are especially valuable at times of systemic crisis, as they give confidence to the market that the member can access foreign exchange funding without liquidating assets in financial markets that may be impaired or would be subjected to added stress from simultaneous action by several central banks. In addition to potentially reducing precautionary reserve accumulation, SDR allocations could conceivably (albeit not in the current legal framework) be used as a policy incentive against excess accumulation of reserves for non precautionary purposes.

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<sup>1</sup> This paper follows up on the outcome of the Board discussion on Reserve Accumulation and the Stability of the International Monetary System (<http://www.imf.org/external/np/pp/eng/2010/041310.pdf>) and (<http://www.imf.org/external/np/sec/pn/2010/pn1072.htm>). The paper was prepared by a team led by I. Mateos y Lago and comprising S. Maziad, A. Piris, and I. Asmundson (all SPR), under the guidance of Ranjit Teja. Substantive contributions were provided by: U. Das, P. Lindner, J. Park, J. Pihlman, and C. Sampic (all MCM); C. Beaumont, A. Attie; and H. Hatanpaa (all FIN); G. Rosenberg, B. Steinki, and R. Weeks-Brown (all LEG).

<sup>2</sup> See <http://www.imf.org/external/np/exr/facts/sdr.htm> for basic facts about the SDR.

<sup>3</sup> See IMFC Communiqué (<http://www.imf.org/external/np/sec/pr/2010/pr10379.htm>); G20 communiqué (<http://www.seoulsummit.kr/outcomes>); and IMF Board discussions (<http://www.imf.org/external/np/sec/pn/2010/pn1072.htm>); the Chairman's Summing Up on the Fund's Role Regarding Cross-Border Capital Flows (<http://www.imf.org/external/np/sec/pn/2011/pn1101.htm>)

- *Develop a new reserve asset:* Issuance by the Fund (or related investment vehicle) of SDR-denominated securities in sufficient volume could offer a safe haven in the event of disorderly diversification out of the existing stock of assets, as well as offering an alternative mode of Fund borrowing at time of high potential demand for its resources.
- *Reduce impact of exchange rate swings:* The SDR unit of account could be used to price global trade, denominate financial assets, peg currencies, and keep accounts and official statistics. The SDR's basket characteristic provide a less volatile unit of account and store of value than its components when measured in domestic currency terms, thereby helping cope with exchange rate volatility for both the official and private sectors (see Box 1). These benefits are all the greater as the use of the SDR in both goods and asset markets is developed. Such development would allow the SDR to serve as focal point for IMS evolution, a more efficient outcome than several segmented markets in various national currencies.
- *Accommodate a greater role for emerging market currencies in the IMS.* The basket could smoothly accommodate a greater role for emerging market currencies in the IMS, notably the RMB: inclusion in the basket would allow holders of SDR-denominated assets to acquire greater exposure to those currencies than otherwise possible, and would create a dynamic conducive to financial deepening and, depending on conditions for joining the basket, capital account liberalization in emerging markets. Generally, as the SDR composition is updated regularly to reflect the relative importance of different currencies in global trade and finance, a system with a liquid market in SDR-denominated assets could flexibly accommodate the evolution of the IMS and mitigate the impact of any sudden shifts in demand for different currencies. However, expanding the basket too much could increase the complexity of the SDR, potentially reducing its attractiveness to reserve managers.

2. ***Realism.*** Caution is needed, however, in considering the SDR's potential:

***Regarding official SDRs***

- With their use limited to the official sector, official SDR holdings provide an imperfect reserve asset, as they cannot be used directly for market intervention or liquidity provision.
- There are tight legal and political constraints to expanding the use of the official SDR, such as the need for an amendment of the Articles to change the way SDRs are allocated or the need for an 85 percent majority of voting power to agree to an allocation of any size.
- Sharp policy tradeoffs must be borne in mind when considering expanded official SDR allocations, in particular, in balancing conditional and unconditional liquidity

provided in crisis times; or balancing risk of “misuse” of SDRs versus their attractiveness as a reserve asset.

***Regarding non official SDR***

- There is currently no natural demand or supply for SDR-denominated securities, reflecting the strong network externalities and increasing returns to scale that characterize use of a currency, in its three functions: store of value, means of payment, and unit of account. It is an open question whether the SDR could take on a systemic role without providing all three functions on a large scale.
- A further question mark concerns the benefits of the basket compared to component currencies. These depend on (i) the frequency with which agents need to rebalance their portfolios; and (ii) the ease of access to the component currencies. For most actors, replicating the current basket is essentially costless given the size, liquidity, and efficiency of global currency markets in the four component currencies; however high frequency rebalancing (e.g. weekly or daily) could involve considerable costs. Inclusion of less easily available currencies would also enhance the basket’s benefits compared to assembling its components.
- Given these issues, providing impetus for the development of a market in SDR-denominated securities could entail significant upfront costs (e.g., liquidity premium, hedging costs), which the official sector would have to bear, possibly for a long time.

3. ***Way forward.*** These obstacles may not be insuperable, but significant political will and consensus across the membership would be needed to address them. That said, most other potential solutions to the problems in the IMS likewise require substantial investment of political will and consensus-building. With this proviso in mind, the rest of this paper outlines some concrete steps that could be taken to enhance the role of the SDR as an alternative reserve asset and unit of account, along with an initial discussion of their benefits, realism, and potential downsides. Clearly, none of these ideas is ready for implementation overnight, but the paper aims to stimulate an open-minded debate that could lead to identifying steps worth further consideration. Needless to say, enhancing the role of the SDR cannot on its own provide a remedy to all the ills of the IMS. But combined with the other efforts intensified in the wake of the crisis—global policy coordination and stronger surveillance; improved global safety nets; orderly capital account liberalization and financial deepening in emerging markets—a greater role for the SDR might help achieve stability as the IMS transitions to a more multipolar equilibrium, and beyond.

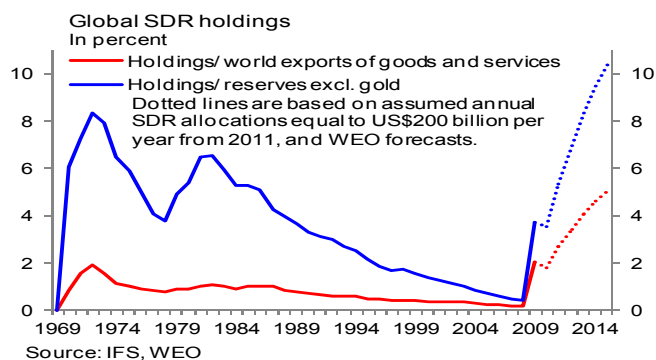
4. ***Outline.*** The rest of the paper is organized as follows: Section II presents a number of modalities to expand the supply and use of official SDR (as defined in the Fund’s Articles of Agreement) with the aim of reducing reserve accumulation and contributing to resolve global imbalances. Section III discusses steps to develop new SDR-denominated reserve assets. Section IV elaborates on the use of the SDR as a unit of account for global trade and

financial instruments to reduce the impact of exchange rate volatility. Section V discusses tradeoffs in expanding the SDR basket. Section VI concludes with issues for discussion.

## II. REDUCING RESERVE ACCUMULATION

### A. Expanding the Supply of Official SDRs

5. **Why?** Expanding the volume of official SDRs is a prerequisite for them to play a more meaningful role as a substitute reserve asset that could thereby contribute to reducing global imbalances. Even after the extraordinary allocation approved in 2009, total outstanding SDRs (204 billion) represent less than 4 percent of global reserves—well under the peak of



8.4 percent reached in the early 1970s. In part reflecting this small share, they are not actively traded. As originally conceived in the late 1960s, SDR allocations were intended to help meet growing global demand for reserve assets in a context where the U.S. dollar's link to gold constrained the U.S.'s ability to do so. This rationale disappeared in 1971 with the end of gold backing for the U.S. dollar. But it may be relevant again in today's medium-term context where many countries have been meeting their demand for reserves by accumulating current account surpluses, which have an overall deflationary impact as countries that had current account deficits over the past decade are now trying to narrow their current account deficits. Further, demand for international reserves appears to be growing much faster than traditional sources of supply, with no clear alternatives on the immediate horizon, which could lead to a debasement of the quality of reserve portfolios (see IMF, 2010f). Larger official holdings would also make active management of this component of reserve portfolios more likely, facilitating development of a meaningful market.

6. **How?** Regular—say annual—allocations covering a significant proportion of the expected demand for precautionary reserves would meet this objective. An annual allocation of the equivalent of US\$200 billion dollars would raise SDRs as a proportion of reserves to a little over 13 percent in the early 2020s.<sup>4</sup> Extrapolating from one estimate of precautionary demand for reserves (Obstfeld, Taylor, and Shambaugh, 2008), sums of this magnitude could be sufficient to meet half of the average precautionary demand for reserves over 2000–09. On-going work on designing reserve adequacy metrics could inform the analysis on the appropriate pace for expanding SDR allocations. Such regular allocations could be made if

<sup>4</sup> WEO forecasts of reserves are used through 2015, and then assumed to grow at 7 percent per year (average of the WEO forecast period). See IMF, 2010f for discussion of possible implications of continued high demand for reserve assets, and more detail on the rationale for allocations of this order of magnitude.

(and only if) Governors representing 85 percent of the voting power of the SDR department<sup>5</sup> agree they are necessary to meet a “long-term global need ... to supplement existing reserve assets (...)” while avoiding inflation or deflation.” This provision sets a high bar of political consensus among shareholders, particularly considering the need for legislative approval in some cases.<sup>6</sup> The best argument for a long-term global need lies in strong accumulation of reserve assets, which is expected to continue.

7. ***Precautions.*** Expanding the volume of SDR allocations would increase the contingent claim on all other participants in the SDR department, who could be required under the designation mechanism to provide freely usable currencies—currently the U.S. dollar, Euro, Sterling, and Yen—in exchange for SDRs up to twice their own allocation of SDRs. This requirement could quickly become burdensome, particularly for members with floating currencies that do not typically hold large official reserves, and could not provide their own currency if not among the freely usable ones. Two complementary solutions could be envisaged. First, expanding the voluntary trading agreements, to avoid recourse to the designation mechanism and concentrate SDR sales on those members most willing to buy. Second, by expanding the current list of freely usable currencies to include a few additional currencies that meet the definition of freely usable currency under the Articles i.e. that are being widely used, in fact, to make payments for international transactions and are widely traded in the principal exchange markets (Article XXX (f)). (Such an expansion in the list of freely usable currency is distinct from and would not necessarily affect the composition of the SDR basket).

## **B. Limits and Potential Downsides**

8. ***Partial solution.*** Given its limitations mentioned above, the official SDR may not be perceived as perfect substitute to borrowed or own reserves, reflecting the fact that it cannot be used directly for market intervention or liquidity provision, as well as its low-yield and the relative difficulty to hedge any net positions. In addition, part of the growing demand for reserves is not precautionary, but reflects other objectives such as influencing exchange rate competitiveness. SDR allocations could only influence such intervention if accompanied by policy commitment to reduce reserve accumulation. Indeed in the absence of such commitment, SDR allocations might even encourage further reserve accumulation, by providing a channel for reserve diversification without market impact.

9. ***Misuse.*** SDRs are a low cost source of unconditional financing; as their outstanding volume increases, so does the risk of their being used in a way detrimental to macroeconomic stability. Examples include procyclical fiscal financing in inflationary environments, use of

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<sup>5</sup> Currently, all members of the Fund are participants in the SDR department.

<sup>6</sup> For example, it is staff’s understanding that such approval is needed in the U.S. for SDR allocations that would cause the U.S.’ cumulative allocation during the basic period to exceed its quota in the Fund.

SDR as a substitute to adjustment, or use of SDRs that contributes over time to an unsustainable debt burden (e.g., as the SDR rate rises). In such cases, not only may macroeconomic stability be compromised, but also potentially the member's ability to pay charges on their allocations or eventually reconstitute their holdings.

10. ***Inflationary impact.*** The potential impact on money creation of the large one-off allocation in 2009 was considered likely to be small and easily absorbed, and any expansionary impact on global demand to be beneficial. Large, regular allocations are similarly unlikely to prove inflationary, including at times of limited slack in the global economy, as argued by Richard Cooper in Supplement 1 to this paper. No money is created unless countries sell their SDR holdings to issuers of freely usable currencies (and even then, any money creation could be sterilized if the relevant central banks so wished), and no additional demand for real goods and services is created unless the proceeds are spent and there is no countervailing policy response. Essentially, the global inflationary impact of SDR allocations is expected to be limited even assuming large cumulative allocations, so long as central banks issuing freely usable currencies credibly stick to their inflation targets. An additional safeguard is provided by the discretion to not make allocations—or even cancel existing allocations—at times of strong global demand and inflation concerns.

### C. Options for Enhancing the Official SDRs

11. ***Basic improvements.*** A number of marginal measures could be taken to improve the SDR in its current form. Providing greater certainty over the basket composition through more objective valuation rules could improve the attractiveness of the SDR. Similarly, daily interest rate setting, rather than weekly, would allow reserve managers fair valuation of SDR assets on a continuous basis and facilitate hedging operations (see Annex 2). However, the lack of appropriate daily instruments in underlying currencies remains a constraint (see IMF, 2010h). Other small changes identified in earlier discussions include clarifying and expanding the scope of permissible operations by moving from a positive to a negative list, eliminating the mandatory use of the official exchange rate in SDR operations, and simplifying the reporting requirements to the Fund to record transfers among members.

12. ***Reconstitution and other safeguards.*** Reinstating a reconstitution requirement—whereby members would be required to restore their SDR holdings to the same amount as their overall allocation over a given timeframe—would help improve liquidity in the voluntary market by raising transaction volumes and ensuring demand for two-way transactions. It would also reduce the scope for misuse of SDRs as open-ended cash transfers, which can be particularly problematic in cases of fragile debt sustainability. To further reduce the risk of misuse, options could include requiring a discussion of any planned use of SDR allocations in Article IV consultations, and where relevant, an ex post assessment in Article IV reports, as well as in any UFR report. At a minimum, use of SDR allocations should be taken into account in debt sustainability analysis. While such safeguards may not guarantee “sensible use” of allocated SDRs, restraining their use more tightly would go



against the principle embedded in the Articles of Agreement that such use is unconditional. It would also attenuate SDRs' substitutability with own reserves.

13. **Advisory group.** In order to give comfort that decisions on SDR allocations are not dominated by political considerations, an advisory board of eminent experts—possibly including central bankers issuing freely usable currencies—could be established to provide an independent opinion on matters concerning the provision of global liquidity to guide the Managing Director's proposals and Board of Governors' decisions on the need and frequency of SDR allocations. The group could also make recommendations on the cancellation of SDR allocations when relevant (see e.g., Subacchi and Driffill, 2010). While its views could not be binding in the current governance structure of the Fund, such a group could nevertheless help ensure a robust decision-making process.

14. **SDR lending/pooling.** Countries willing to do so could—on their own or as a pool—on-lend their SDRs to the ones in need of external financing. The latter would pay the SDR interest rate (possibly with a mark-up to compensate the pool lenders for credit risk), and exchange these SDRs for freely-usable currency to meet their balance of payments needs. This mechanism would make use of the available SDR resources (after the 2009 allocation, G7 and euro area countries could mobilize a total of SDR 111.7 billion, for example). Even if the SDR rate were to rise over the next years, it is unlikely SDR-based financing would become more expensive than alternatives given how it is determined (i.e., as a weighted average of representative short-term rates in the component currencies). Further, there is no rollover risk associated with the use of the SDR (although borrowers and lenders could agree a timeline for the SDRs to be returned (or additional compensation for extended-period loans).

15. **More radical reforms.** While the aforementioned steps could be taken within the current Articles, they are unlikely to go far enough to allow a much greater role for the official SDR in the IMS. The steps discussed in the remainder of this section may fulfill that objective; however their implementation would require an amendment of the Articles.

16. **Contingent allocations (Escrow).** To reduce the risks from unconditional availability of significant amounts of financing, a requirement could be instigated to hold all or part of the SDR allocations in escrow for use only in case of shocks, with a decision by the Executive Board or the Board of Governors determining when the SDRs would be released for use (membership-wide, or targeted to countries affected by the shock)—e.g., at times of systemic stress. Such a mechanism would have the downside of reducing the substitutability of own reserves for SDRs and would therefore likely be less effective than regular allocations in containing the demand for precautionary reserves. However, the decision process could be designed to reduce uncertainty over the likelihood of ad hoc SDR allocations at times of financial distress. And keeping the allocations in escrow may help overcome resistance to large regular SDR allocations at other times, particularly when liquidity appears abundant.

17. **Targeting.** As SDR allocations are distributed in line with quotas, the bulk of the allocations go to countries that are not accumulating reserves, may have little need for additional reserves, or are unlikely to have an active need to participate in SDR transactions. While there is no significant cost from this “misdistribution,” it complicates political decision making on the size of the allocation, as the headline amount is much larger than the actually relevant one. Changing the way in which allocations are distributed could alleviate this problem. Thus, allocations could be focused on countries considered to have low levels of precautionary reserves compared to broadly accepted reserve adequacy benchmarks (ongoing work on reserve adequacy metrics would provide some guidance), or as noted above, on countries affected by a systemic shock.

18. **Incentives.** One could also envision SDR allocations to be conditional on policies being deemed appropriate according to benchmarks to be determined, or on a forward-looking policy commitment to adhere to a certain level of reserve accumulation. Another model has been proposed by Truman (2010b) under which the membership would agree on a set of policy norms intended to help assess adherence to a member’s obligations; findings of non adherence could lead to freezing the member’s access to SDR holdings or denial of participation in future SDR allocation. A downside of such a proposal would be to imply much lighter pressure on reserve issuing countries, which essentially have no needs for SDRs, than on all other countries. This could also be combined with the escrow approach.

19. **Implications for Fund lending.** Any move in the direction of conditional and/or targeted SDR allocation would blur the distinction between SDR allocations and IMF lending. Thus, one might ask why go through a cumbersome process of amending SDR allocation rules to achieve something that could be done through IMF lending. One reason would be the objective of increasing the role of the SDR in the system, through an increase in the volume of SDRs in circulation; another would be views on the desirable size of the Fund: SDR allocations (escrowed or not) offer an additional safety valve to deal with systemic shocks that might otherwise overwhelm the Fund’s commitment capacity, unless its resources were kept permanently far above foreseeable needs.

20. **Private use of SDR.** Allowing private sector holding (and trading) of official SDRs would enhance their reserve asset quality as central banks could use them directly to intervene or extend liquidity to the market, instead of having to go through the Fund’s voluntary market or designation mechanism to exchange their SDR holdings for useable currency, a transaction that can take several days to complete. It could also help spur development of a market in other SDR-denominated assets and contribute to the development of other reserve currencies. Private sector institutions could be interested in holding official SDR based on a calculation that the market may develop further and for the potential benefits of SDR as a source of liquidity. Allowing the private sector to use SDR holdings as collateral to obtain freely useable currencies at times of globalized liquidity squeeze or financial distress could increase the incentives for holding SDRs. This would require consent from key central banks to provide a market for private participants, or opening the Fund’s voluntary market to them, which may require capping the amounts of SDRs eligible for such

transactions. Private holdings of SDRs could thus directly contribute to alleviating stress at times of crisis and would mimic the global provision of foreign currency swap lines.

### III. DEVELOPING NEW RESERVE ASSETS

21. *A less constrained route.* Official SDR allocations would clearly contribute to the objective of expanding the supply of safe reserve assets. However, given their limitations and the very high degree of political consensus needed to enhance their role, it is worth exploring whether there would be other ways of creating new reserve assets that could be denominated in SDRs (not to be confused with existing types of reserve assets, that could be redenominated in SDRs; these are discussed in Section IV). The focus in this section is on steps that could be taken by the Fund or a subset of its membership acting together. These include: i) Fund-issued SDR bonds; and ii) other SDR-denominated reserve-backed assets that could facilitate the diversification of reserve holdings and spur market development for other SDR securities.

#### A. Fund-issued SDR Assets

22. *SDR-denominated bonds.* The Fund could build on its issuance of notes denominated in SDR in 2009.<sup>7</sup> Expanding the issuance of SDR notes would achieve two objectives: directly contribute to increasing the supply and diversity of global reserve assets, and help establish a benchmark yield curve to price SDR-denominated assets issued by others. The Fund would be a low-credit risk issuer since its liabilities are backed by available quota resources, which are claims on the entire membership rather than a single country, and by other GRA assets such as gold. Fund-issued notes could be held both by the official and private sectors to create market depth and liquidity. A regular program of modest issuance would also build conditions that would allow the Fund to tap markets in very large amounts if needed during a global systemic crisis. As these are precisely the times when there is a flight to quality, this would be an automatic mechanism to expand the market in safe assets when the demand is highest. So long as such issuances were undertaken strictly to supplement the Fund's resources (i.e., for purposes of meeting UFR demand from members), this move would be possible under the current Articles. However, issuance in private markets would require the resolution of questions such as the appropriate maturity structure of the bonds in light of the repurchase schedule of Fund financing, the implications for Fund operations of regulatory requirements in the jurisdictions where bonds would be issued, and the design of appropriate safeguards against perceived conflicts of interest related to the Fund's surveillance and financing functions. It is also unlikely that it would be possible

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<sup>7</sup> Currently the Fund has issued SDR 3.2 billion in notes to the official sector with a floating interest, and signed notes purchased agreements for up to SDR 45 billion. As with other Fund borrowing, the issuance of notes is authorized only where the Fund needs supplementary resources, and in practice the timing and amount of issues is determined to match Fund loan disbursements.

within the constraint of the current Articles to issue enough paper to establish and maintain at all times a benchmark yield curve.

23. ***New financial structure.*** By contrast, expanding the issuance of notes in regular intervals irrespective of a need for supplementary resources would entail a large shift in the role and financial structure of the Fund, requiring an amendment to the Articles of Agreement. Similar design issues would need to be resolved as noted above for issuances to supplement the Fund's resources. In addition, such a new structure would require a scaling up in the Fund's investment operations and strategy. Should the Fund face a shortfall in the amount needed to cover payments, there would either have to be resources diverted from other operations (not allowed under the existing Articles), or members would have to commit new funds. Careful consideration would also have to be given to the operational structure of such borrowing operations, including protection to avoid additional conflicts of interest arising from the Fund's surveillance and financing role and its new role as global borrower and investor of borrowed resources.

24. ***A longer-term vision.*** After substantial market depth has been established, which would require very substantial amounts to be issued, and if the perceived safety of other global assets were to decline, Fund-issued SDR securities could be a potential anchor off which to price risk throughout the system (assuming the SDR valuation method ensured the SDR were representative of economic weights in the IMS). In the even longer run, if there were political willingness to do so, these securities could constitute an embryo of global currency. Of course, this longer-term vision is highly hypothetical and support for the nearer term steps need not imply commitment to the longer-term ones.

## **B. Reserve-backed SDR Assets**

25. ***Substitution account.*** The idea of a substitution account to exchange members' foreign currency reserve assets for SDR-denominated claims was considered in the 1970s and eventually rejected for lack of agreement on who would bear the exchange rate risk (see discussion of substitution account in IMF, 2010f). The idea was that an off-market reserve pool managed by the Fund would provide an opportunity for large reserve holders to diversify their reserve assets while limiting the risk of market disruption, particularly a sharp depreciation of the dollar. Use of the account could therefore smooth the process of reserve currency diversification that would accompany a shift in the IMS toward a multi-currency regime and would also increase the supply of SDR securities. However, issuing SDR-denominated claims against assets comprising U.S. dollar or other currencies exposes the account to exchange rate and potentially interest rate risk. Unless participants were not allowed to redeem their claims (which would challenge the liquidity of the securities issued by the account), a risk-sharing mechanism would need to be agreed, and it is not clear why this problem could be more easily surmounted today than in the 1970s.

26. ***Alternatives.*** To mitigate exchange rate risks, the account could be structured to exchange SDR-denominated claims for foreign currencies with the same composition and

proportions as the SDR basket, and retain a similarly-structured portfolio. However, this would essentially eliminate the currency diversification benefits to members, while not necessarily providing obvious benefits in terms of global diversification of reserve assets (unless the account were to invest in official SDRs—or SDR-denominated securities issued by others than the traditional reserve issuers; this however would expose the account to credit and liquidity risk that would need to be covered by members). Another alternative would involve having a willing subset of the Fund’s membership pool (part of) their official reserves into a Trust managed independently (within or outside the Fund), and agreeing among themselves on risk-sharing rules. This could achieve both reserve diversification and supply of a new kind of SDR-denominated security (issued by the Trust), and would therefore seem the most promising route if members with large enough reserves were interested in pursuing it.

#### IV. MITIGATING EXCHANGE RATE VOLATILITY

27. **How?** Use of the SDR as a unit of account could mitigate the impact of exchange rate volatility through: i) use of SDR to price international trade, report data on international transactions, and as an exchange rate peg; and ii) denomination of assets in SDR. The latter would require the development of a private market for SDR-denominated assets with impetus from the official sector and support to build the market infrastructure. The rest of this section discusses these issues. SDR valuation is clearly key to determine the optimality for any country or economic agent of the SDR basket as a hedge against exchange rate volatility. It is discussed in the next section. In all cases, an important distinction is between the denomination of certain transactions or securities and their settlement. Use of the SDR for denomination (what is at issue here) leaves full discretion to the parties to choose any currency for the actual settlement of their trade.

##### A. Pricing, Accounting, and Pegging

28. **Foreign trade pricing.** While it might be most advantageous for countries to trade in their own currencies to reduce uncertainty over export (import) receipts (payments), in practice, this would not be a globally efficient outcome. As such, use of SDR invoicing and pricing could be advantageous as it would stabilize export receipts (in local currency) compared to single currency pricing, and more generally would avoid exchange rate volatility amplifying commodity price swings (see Box 1). Clearly, the argument does not apply for countries whose foreign trade is predominantly denominated in their own currency, or even for those that trade overwhelmingly in one foreign currency. Generalized use of SDR as a unit of account for global trade invoicing would also create demand for SDR-denominated assets as both the public and private sectors develop exposure to SDR-denominated flows. Liquidity of such instruments would likely be a problem initially however. More generally, premature switching to invoicing global trade in SDR could be disruptive, raising transaction costs as final settlement would have to be undertaken in the underlying currencies. However, a clearance/payments system could be established to settle SDR claims directly (see Annex 2).

29. **Data reporting and accounting.** To reduce the valuation effects that usually impact statistical reporting, and facilitate cross-country comparisons over time, the IMF could disseminate balance of payment statistics in SDRs (perhaps in addition to US\$ initially). The transition to a new reporting system could be costly for some users and would have large administrative costs for the Fund, with few benefits beyond signaling, until SDR usage became more common. Data on international reserves might be an exception where SDR reporting would have immediate benefits however. Further, a number of international and regional institutions already use the SDR as a unit of account for their accounting (e.g., the BIS, which finds that it stabilizes the value of its balance sheet). Some central banks (e.g. RBNZ) use it as a unit of account for internal monitoring of foreign reserves. Similarly, global corporations might benefit from the stability of the SDR. However, global accounting standards currently require that the currency of the country where most of the operations are based be used for official accounting purposes.

30. **Pegging.** A number of countries peg their exchange rates to a basket of currencies. This may be preferable to single currency peg for countries with diversified trade and investment partners as it better reflects the composition of their balance of payments flows. While the SDR may not be any country's optimal basket (except perhaps for commodity exporters in a world where commodities were priced in SDR), it has the merit of pre-existing and being publicly quoted, which has both transparency and practical benefits. Moreover, to the extent that pegging to another currency implies importing its monetary policy, an SDR peg would allow a monetary policy that is representative of global conditions and less dependent on the policy stance of any single economy.

## **B. Asset Denomination**

31. **Critical elements.** The development of a market for SDR-denominated assets would facilitate acceptance of a greater role of the official SDR as a reserve asset and unit of account, by enhancing liquidity and facilitating hedging. Significant efforts by the official sector would likely be necessary to provide initial impetus for market development. A set of policy commitments by the official sector would likely include: i) creating the market by announcing official sector commitment to issue and invest in SDR-denominated assets; and ii) support to market infrastructure development.

32. **Role of sovereigns and IFIs.** Aside from the Fund, other IFIs and sovereigns could play a critical role in supporting the development of a private market for SDR-denominated assets. Specifically, the commitment of a few highly-rated issuers to a regular program of issuance of SDR-denominated assets could kick-start market development. Crucially, it would provide the market with benchmark instruments to enable the pricing of other SDR-denominated securities that could be issued by the private sector. A public statement of interest in such assets by large reserve holders would mitigate the liquidity premium likely to be demanded initially by investors. Denominating existing reserve assets in SDR will not in itself create new reserve assets. Yet, it could contribute to a more orderly process of global asset diversification, and reduce the volatility associated with exchange rate movement in

domestic currency. Although the basket composition may not be optimal for any given country, it is potentially a better hedge against exchange rate volatility than foreign debt in a single currency, and over time greater liquidity might be obtained by issuing in one denomination—the SDR—than in each of the underlying currencies to replicate the basket. Similarly, a number of IFIs periodically raise funds through market bond issuance, including the World Bank and regional development banks. A switch to denominating those bonds in SDR could provide impetus for market development. To reduce the need for hedging such borrowing, these institutions could also denominate part of their lending in SDR. SDR bonds could also be swapped back in usable currencies with the intermediation of private-sector banks, thus engaging the private sector and encouraging further market development.

33. **Costs.** SDR-denominated assets would operate in a shallow market at first and therefore would likely carry a liquidity premium. This is estimated initially at around 80–100 basis points, which could render it too costly for any *individual* country or IFI to take the first step and provide the impetus for an SDR-bond market, particularly in a context of fiscal consolidation pressures (see Annex 2 for details on the liquidity premium estimate). More generally, bundled goods are typically priced at a discount over their components if all are readily available, and the same might be expected of SDR-denominated instruments unless they included less readily available components (see next section). The experience of the ECU—where several countries and European institutions primed the market together—showed that markets developed quickly to the point where arbitrage pushed the interest rate on an ECU instrument close to the weighted average of the comparable national interest rates. But they also offered easy diversification at a time where bond markets were less globally developed, and in particular access to German government securities by non residents was constrained. A functioning interbank market and clearing mechanism also increased the liquidity of ECU instruments and ensured the appropriate pricing of ECU instruments relative to component currencies (see Box 2). A similar process might be expected as a market for SDR assets develops.

34. **Mitigating costs.** To enhance initial market liquidity and reduce the premium faced by first movers, it may be useful to have a ‘group’ issuance where a number of countries issue jointly, thus expanding the volume issued, reducing fixed cost to individual issuers and the liquidity premium. Coordination should be aimed at establishing relatively quickly liquid benchmark instruments throughout the maturity spectrum. Another approach, possibly used in parallel, would be to issue SDR-denominated assets for private placement with interested sovereigns and institutional investors, as they are likely to hold those assets to maturity, thus may not require a high liquidity premium to invest in the newly-created assets (see Annex 2). This would mitigate the concern over lack of liquidity initially, though of course it would not enhance the liquidity of the SDR market overall. Another key part of the equation would be to ensure there is adequate demand for those assets (see below).

35. **Potential investors.** Some of the features of the SDR as a basket and the potential for diversifying credit risk could attract large reserve holders and long-term institutional investors. For most other classes of investors, demand for SDR-denominated assets would

essentially have to follow the lead of public sector institutions, and early sensitization of these actors by the international official community would be critical. Sovereigns and large institutional investors would have to take on the role of developing the market and enhancing its liquidity. Potential investors could be classified as follows:

- Large reserve holders and sovereign wealth funds could lead market demand with the objective of diversifying their reserve holdings (therefore focusing their interest on new SDR assets more than re-denomination), and a lesser interest in liquidity than other classes of investors. Other long-term and ‘buy to hold’ institutional investors could follow if they have appropriate investment mandates to diversify their portfolios into highly-rated SDR-denominated assets. Such investment mandates typically change with inertia however, and place a high premium on market depth.
- Availability of liquid investment and hedging instruments to cash managers would encourage demand by large global corporations (assuming greater use of SDR in global trade). Demand by fund managers and retail investors are likely to be the last step in building demand for SDR assets. Fund managers would have an incentive to include SDR-denominated assets in their portfolios if those instruments were included in major bond indices, which are often passively tracked by fund managers. Retail investors could also be attracted by the features of SDR-denominated assets as a pre-packaged diversification strategy.



### Box 1: SDR Trade Pricing

Quoting commodity prices (e.g. oil) in SDR has a number of advantages compared with the current system of pricing in U.S. dollar (except for countries using the U.S. dollar as their currency); including:

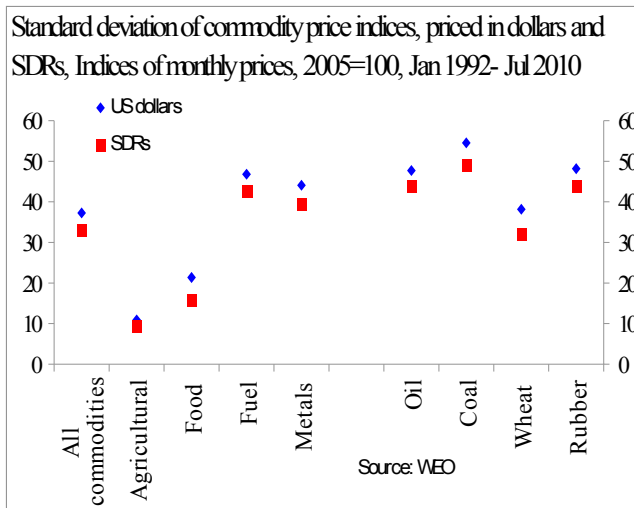
*Stabilizing export receipts.* Assuming that the objective of commodity exporters is to stabilize export receipts in terms of local currency, the ideal pricing strategy for them would be to quote prices directly in domestic currency. However, there are a number of considerations that would make this impracticable or inefficient (e.g. existing pricing practices, where standardized price quotes in a common vehicle currency dominates pricing behavior for homogenous goods, and pricing to market practices). A second best might be SDR pricing for the following reasons:

- As basket, SDR is less volatile (compared to component currencies) in domestic currency terms so would provide greater certainty over export receipts, especially as trade is based on forward contracts;
- SDR pricing would eliminate some of the volatility of exchange rate movements, contributing to smoother price evolution. Commodity prices would better reflect underlying market conditions.

*Natural demand.* Commodity exporters are importers of other goods and services from different parts of the world, therefore, SDR pricing of exports would better reflect the evolution of their terms of trade and import bill to the extent that a portion of imports in non-dollar denominated. For example, if the euro were to appreciate against the dollar, commodity exporters with a component of imports from Europe would be better hedged if their exports were denominated in SDR, as part of their receipts would then be denominated in Euros even if it does not exactly match the composition of their imports or the invoicing currency.

*Benefit to importers.* To the extent that commodity importers have a market-determined exchange rate regime (or simply do not peg to the U.S. dollar), SDR pricing would also stabilize their import bill and, generally, would be a better hedge for the composition of their export receipts.

By way of illustration, the tables below demonstrate the benefits described above for a number of countries with floating exchange rate regimes. For freely floating currencies, exchange rates are less volatile against SDR, and hence pricing oil in SDR, for example, would reduce the volatility of prices expressed in national currencies.



Standard deviation of oil price index, priced in dollars and SDRs and converted into national currencies, 2005=100

Exchange rate volatility, Index 2005=100

Exchange rate volatility National currency per	Canada		Australia		New Zealand	
	SDR	US\$	SDR	US\$	SDR	US\$
2000-10	9.2	16.6	13.3	22.0	10.6	19.4
2007-10	5.7	6.8	9.6	10.9	3.6	5.9

Oil Price volatility in national currencies

Pricing currency	Canada		Australia		New Zealand	
	SDR	USD	SDR	USD	SDR	USD
2000-10	8.8	16.5	17.1	21.8	13.0	26.6
2007-10	5.6	6.9	7.2	10.9	9.5	12.9

36. **Market infrastructure.** A functioning market for SDR-denominated assets would require the public sector to provide liquidity support for SDR-denominated financial instruments and facilitate trading; frequent interest rate setting and benchmark pricing; and facilitate the establishment of a settlement and clearing system. Liquidity support could be provided through an “SDR window” or Repo facility to discount SDR-denominated assets and provide daily interest rate setting. A settlement and clearing system could be developed among private sector financial institutions who would act as market makers and clearing house, similar to the experience of the ECU clearing system. While these would need to be created from scratch, experience with the ECU suggests the process may be relatively fast, and need not involve significant public support beyond the initial phase (See Box 2 and Annex 2 for detailed technical background).

## V. SDR BASKET COMPOSITION

37. **Objective.** An SDR basket composition that maximizes the SDR’s attractiveness in all the roles discussed above is one that makes it, to the greatest extent possible, representative of global economic and financial weights, liquid, and simple to use and hedge. Unfortunately, there are trade-offs between these objectives. At a minimum, there will be a trade-off between the necessary evolution of the SDR composition (if it is to remain representative) and predictability of its future value; although a rules-based valuation process could go a long way toward addressing this problem. A work program on reviewing the SDR valuation methodology and considerations for expanding the basket is expected during 2011 (see IMF, 2010h). Without prejudging its conclusions, the remainder of this section sets out a few considerations to bear in mind in the process.

38. **Emerging market currencies.** Including emerging market currencies in the basket as their shares in global trade and finance increase could enhance the attractiveness of the SDR by increasing its diversity and representativeness. Moreover, such process could facilitate a greater role for emerging markets in the IMS as well as support financial deepening in those markets. However going beyond a few additional currencies could mean adding currencies with low weight, increasing complexity and transaction costs for those tracking the SDR basket or needing to hedge their exposure. A side effect of such changes might therefore be that some central banks may not be willing to increase their SDR exposure. This would have implications for their willingness to participate in the voluntary trading arrangements that support SDR liquidity. If a more than a few of the smaller arrangements lapsed, the whole system could be undermined. On balance, adding a large number of emerging market currencies thus seems undesirable, but there may be a case for the ones with the largest weights in global trade and economic growth.

### Box 2: Development of the ECU Market

The market for ECU-denominated assets, including derivatives, developed rapidly with little official support beyond regular issuance of ECU-denominated debt by sovereigns and EC institutions. The private sector took the lead in developing the market, including market making and establishing a settlement mechanism. By 1990, the ECU ranked the sixth most used currency in terms of outstanding international bonds. At the outset, ECU-denominated assets were attractive substitutes to its component currencies and allowed market participants to circumvent some regulatory restrictions.

The European Currency Unit (ECU) was created as a basket currency in 1979 in connection with the European Monetary System (EMS), comprising nine European currencies and was later expanded to include the currencies of the twelve members of the European Community (EC). The ECU served as the basis for the EMS exchange rate mechanism (ERM) and for defining the parity grid among component currencies. The **official ECU** was created as a liability of the European Monetary Cooperation Fund (EMCF) by swapping such ECUs for 20 percent of the gold and gross U.S. dollar reserves held by central banks participating in the EMS. Official ECU was used only in transactions with EC central banks and a limited number of designated holders. **Private ECU**, on the other hand, was ECU-denominated liabilities of the banking sector. The proceeds from issuing obligations in the form ECU-denominated liabilities were payable in ECU-denominated deposit liabilities of designated banks. A number of European sovereigns, including France, Italy, and the U.K. issued ECU-denominated domestic bonds (Mehnert-Meland, 1994; Levich and Sommariva, 1989).

The ECU Banking Association created a clearing system centered around 45 ECU clearing banks, with the BIS acting as an agent of the private ECU clearing and settlement system. The use of the private ECU grew rapidly, including retail banking, especially in Italy and the U.K. By the first quarter of 1991, ECU-denominated bonds accounted for more than 5 percent of total international bonds outstanding and for over 15 percent of total secondary market turnover in the international bond market (McCauley, 2006). Although there was never an official mechanism to maintain the parity between the private and public ECU, until 1988 the value was fixed in terms of the official basket by a group of major European banks who stood ready to convert private ECUs into the basket at par. A growing concern in these institutions about their increasing net ECU exposure led them to discontinue fixing the private/public ECU exchange rate. Prior to the ERM crisis in 1992/93, the private ECU came to command a significant exchange rate premium over the official basket, reaching a peak of a 100 bp in 1991. The rules set by the BIS as a clearing house maintained the link between the conditions prevailing in the official ECU market and the term structure of interest rates charged in the private ECU market, thereby maintaining the relation between official/private ECU exchange rate as determined by an interest rate parity condition (Folkerts-Landau, 1992). Overtime, as the private ECU market expanded, European central banks started holding private ECU as part of reserves to use for market intervention.

Although the prospects for a common currency were initially limited, ECU-denominated assets offered the benefits of pre-packaged diversification for bond holders and smaller currency exposure to bond issuers at a time when currency swaps did not exist. Issuing ECU-denominated bonds also facilitated regulatory arbitrage and reflected a 'search for yield' on the presumption of the basket stability. The success of the private ECU was in part due to the restrictions on the use of the Deutsch Mark (DM) to denominate bonds by nonresidents; foreign banks were able to issue ECU-denominated assets as a proxy for issuing DM bonds, given its weight in the ECU basket. ECU-bond holders were able to obtain excess returns over DM-denominated assets while bearing little exchange rate risk, as the weights and cross-exchange rates were set within the official basket. In the aftermath of the ERM crisis in 1992/93 and the financial liberalization required under the single market, the ECU issuance declined and the stock of outstanding bonds shrank sharply from a peak of close to ECU 90 billion in 1992 to less than 60 billion in 1997. Issuance only recovered as the introduction of the euro approached and reflected the EC's commitment to convert one ECU for one euro when the common currency was introduced (McCauley, 2006). The experience with the ECU market points to the link between public and private sector interaction to develop a market, as well as profit-making opportunities that encourage the private sector to take the lead in market-making.

39. ***Not-fully convertible currencies.*** Under the Executive Board-approved SDR valuation method in place since 2000, all the currencies in the SDR basket must be “freely usable currencies,” as determined by the Fund (currently Dollar, Euro, Pound, and Yen). From the entry into effect of the Second Amendment, when the concept of freely usable currency was established, to 1982, the SDR basket included a number of currencies that not only were not on the list of freely usable currencies, but also had restrictions on both current and capital account transactions. Adding a not-fully convertible currency in the basket could actually increase demand by the private sector for SDR-denominated assets, as it would make it easier to acquire exposure to this currency than possible at present (with that advantage disappearing as the capital account becomes more open). At the same time, a nonconvertible currency in the SDR basket could aggravate some of the challenges facing greater use of the SDR. In particular, hedging costs and risk management would be much more complicated, as SDR holders/issuers may not be able to hedge fully against currency fluctuations of a nonconvertible currency. Similarly, central banks with a duty to put in place adequate risk management policies may find it difficult to hold an SDR that implies an exposure which cannot be managed owing to incomplete convertibility. Thus, *prematurely* adding not-fully convertible currencies would reduce the attractiveness of SDR, and indeed could lead the current SDR system to collapse (as noted above) but as illustrated by the example of the Chinese RMB (see below), it is not clear that currencies should await full convertibility to be allowed into the basket. A change in the SDR valuation criteria to allow the addition of non fully convertible currencies to the SDR basket (see also next paragraph) would not imply that they would also be added to the list of “freely usable currencies” as only currencies that meet the test for freely usable currencies under the Articles can be added to that list; the ability to use the currencies received in exchange for SDRs for balance of payments purposes and the SDR’s reserve asset character would therefore remain protected.

40. ***The RMB question.*** The recent review of the SDR valuation concluded that in spite of China’s prominent share of global exports, the RMB should not be included in the SDR basket, as it did not meet the criteria to be determined a freely usable currency (<http://www.imf.org/external/np/sec/pn/2010/pn10149.htm>). It is an open question however whether this criterion should be retained as part of the SDR valuation method. Recent reforms that allow nonresidents, including central banks, to hold RMB-denominated deposits and the gradual development of RMB derivatives in Hong Kong could contribute, overtime, to resolving some of the technical difficulties in hedging RMB exposure. These could perhaps be supplemented by additional convertibility agreements between the PBC and other SDR designated holders. Such steps might be sufficient to preserve the SDR’s attractiveness with traditional reserve managers, particularly if explicitly part of a broader plan including a credible public commitment to internationalize use of the RMB and to liberalize capital flows. Other issues might need to be considered however, in particular the fact that the RMB’s value is tied to the dollar and managed by the authorities. Thus, adding the RMB to the SDR basket would de facto increase the weight of the U.S. dollar in it, and allow the exchange rate policy of one country to impact the value of the SDR in a discretionary way.

## VI. CONCLUSION AND ISSUES FOR DISCUSSION

41. Risks to the stability of the IMS should neither be exaggerated nor readily dismissed. The SDR, if used more in its various guises—official composite reserve asset, unit of account, and possibly new class of reserve assets—could potentially contribute to the long-term stability of the system, alongside other reforms that have their limitations too. The paper presented a number of options to this end, many coming with question marks as to their effectiveness or feasibility (see Annex 1).

42. The options discussed above could be thought of as a menu whose elements can be experimented with incrementally, with some requiring a large degree of consensus in the international community that may take years or decades to build (e.g., most of those requiring amending the Articles of Agreement), but others implementable in a meaningful way by a subset of like-minded countries within a relatively short-time frame (e.g., use of SDR as a unit of account for some international trade and bond issuance). There is no obvious sequencing to consider between the different sets of options presented here. In principle, all can be pursued independently. However, it is clear that they are mutually supportive (for example, managing large SDR allocations would be much easier if there were liquid markets in SDR-denominated securities or if SDRs were used to invoice international trade). Further, unless a critical mass of steps is taken, the SDR is unlikely to make a visible difference in the functioning of the system. But over time their combination could result in the SDR playing a significant role in the system and enhancing its stability. This being a process measured in decades rather than years, a key issue is how to establish and retain momentum over time.

43. At this point, Directors' views are sought on the following questions:

- Do directors agree that enhancing the role of the SDR might contribute to the stability of the IMS over the medium to long term?
- Among the options presented in the paper to expand the supply of official SDR, develop new SDR-denominated assets, and encourage use of SDR as a unit of account, which ones appear promising in the near term and should be considered further, including through public consultations and with potential SDR users in the private sector? Which ones might be considered for the longer run? And which should be discarded?

## Annex 1

## Summary of key options to enhance the role of the SDR

<i>Page</i>	<i>Proposal</i>	<i>Limits to feasibility or effectiveness</i>
<b>Increasing the use of the official SDR as a reserve asset</b>		
7	Make regular (e.g., annual) SDR allocations.	Potential misuse (e.g., delayed adjustment); overwhelming of voluntary trading system.
10	<i>Expand voluntary trading agreements and list of freely usable currencies</i>	
10	<i>Reinstitute a reconstitution requirement.</i>	
10	<i>Include allocations in debt sustainability analysis.</i>	
10	<i>Staff assessment of use of SDRs in Article IV reports where relevant.</i>	
10	<i>Establish independent advisory group on allocations.</i>	
10	Lending of SDRs between members.	
11	Escrowed, crisis-contingent allocations.	
11	Targeting SDR allocations.	
11	SDR allocations or use conditional on appropriate policies.	
11	Allow private sector use of SDRs.	
9	No mandatory use of official exchange rates.	
9	Daily interest rate setting.	
9	Expand scope of permissible operations.	
9	Greater predictability on basket composition.	
9	Simplify reporting requirements.	
<b>New SDR-denominated reserve assets</b>		
12	Fund issuance of SDR-denominated bonds within limits of need to supplement quota resources.	Small amounts, irregular issuance.
12	Issuance over and above current needs.	Investment policy required; governance concerns.
13	Create a substitution account.	Who bears currency risk?
14	Create trust fund to bear currency risk.	
<b>The SDR as a unit of account</b>		
14	Use the SDR as a unit of account for trade.	Network effects; SDR not a means of payment.
15	Report data (e.g. balance of payments) in SDRs.	Costly for the Fund
15	Present accounts in SDRs (e.g. internationally active private firms).	National laws would need to be changed; costly for private sector if dual currency reporting.
15	Exchange rate pegs referenced to SDR.	SDR may not always be a superior reference
15	Issuance of SDR-denominated bonds by sovereigns and MDBs.	Willingness to pay liquidity premium, possibly for a long period.
15, 19	<i>Support liquidity by developing infrastructure such as an SDR repo window.</i>	Willingness to bear costs, credit risks. Change of Articles if the Fund were to do this.
17	<i>Support liquidity through purchase by large reserve holders and SWFs.</i>	Holders would have to absorb the cost of the liquidity premium.
<b>SDR composition</b>		
20	Include new currencies in SDR basket.	Trade-off between diversification benefit and costs of currency risk management.
20	Include nonconvertible currencies.	Both benefits and costs of trade-off more acute.
	Italics denote steps intended to facilitate implementation	of non italicized measure just above.
	Requires amendment of Articles of Agreement.	

## Annex 2: Technical Background on SDR Market Development<sup>1</sup>

The annex is organized in two main sections: section I provides a summary of the written survey results conducted in July 2010 to solicit the views of reserve managers and IFIs on the potential for expanding use of the SDR and SDR-denominated instruments as a reserve asset. Section II details a number of technical and infrastructure issues that are critical for creating a market for SDR-denominated assets.

### I. Market Participants Survey Results

*This section identifies a number of issues and solutions based on the results of the survey and staff analysis. Nine central banks, three private sector institutions, and two international financial institutions provided their feedbacks on the practical issues surrounding greater use of SDR-denominated assets. Most reserve managers and private sector investors shared the view that adequate liquidity is the most important and critical feature for SDR to be an attractive reserve asset. Also, they would like to have diverse SDR-denominated assets in terms of maturity and regular publication of SDR-basket interest rates. Potential issuers of SDR-denominated assets; namely IFIs had very similar views to those of investors. Both the World Bank and Asian Development Bank would be open to issuing SDR-denominated securities as long as there is adequate demand by investors and they could swap the SDR to their desired currencies and interest rates.*

**Market development issues:** the questionnaire respondents raised the following issues, as necessary for market development:

*Liquidity of SDR.* Most questionnaire respondents shared the view that liquidity is the most important feature that the SDR should possess to be an attractive reserve asset. Large part of reserve assets is maintained for liquidity purposes (e.g., to respond to external shocks or tackle balance of payment issues). Investors prefer taking their positions in each constituent currency directly rather than holding SDR because transaction costs are negligible in most major government bond markets, while SDR lacks liquidity, yield curve, and secondary market. Liquidity issue has become a more critical consideration for many reserve managers, as their experience in the crisis renewed their perception of liquidity risks.

*Return and valuation of SDR.* The SDR interest rate is determined weekly and is based on a weighted average of representative interest rates on short-term debt (e.g., three months) in money markets of the four constituent currencies. However, reserve managers' portfolios, in many cases, include longer-term bonds (e.g., 12 months, 2 years, and 5 years) and large institutional investors (e.g., pension funds and mutual funds) may prefer longer-term

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<sup>1</sup> This annex was prepared by a team from the Monetary and Capital Market Department (MCM).

maturities depending on their liability structure or clients' needs. Given the usually positive slope of the yield curve, holding SDR implies opportunity costs in terms of foregone return that might be quite significant for some investors. Moreover, the SDR interest rate is derived from the interest rates of the constituent currencies, not driven by demand and supply for SDR itself.

*SDR basket composition.* Investors' views varied on this issue. Some felt that adding more currencies in the SDR basket could increase its attractiveness, especially if it includes currencies that are traditionally difficult to get access. On the other hand, others were concerned that adding currencies could increase SDR's complexity and make it more difficult for risk managers to hedge. Some felt that it would be already complicated for investors to manage four currencies of regions with different macroeconomic conditions and regulatory regimes.

*Expected role of IFIs.* Some investors expressed the view that active participation of IFIs, with low credit risk, in issuing SDR-denominated assets is necessary at the early stage of market development. However, they felt that it would not be sufficient for considering the SDR as attractive asset class, unless liquidity issue is resolved. An SDR-denominated asset with low credit risk could be an attractive substitute for some government bonds, as they can reduce concentration risk of reserve assets. IFIs and regional development agencies can, thus, play a critical role to increase the liquidity of the SDR market, by diversifying their funding sources through the issuance of SDR-denominated securities. IFIs routinely issue bonds in various currencies, therefore, would be open to issuing SDR-denominated securities as long as there was strong demand by investors and they could swap the SDR to their desired currency or currency composition and interest rates.<sup>2</sup>

*Settlement System.* From a purely technical point of view, there is no obstacle that would prevent the private sector from establishing a functioning settlement system in SDR. However, private sector institutions usually invest their capital when they believe market-making business provide sufficient "profits." Under the current institutional arrangement related to the SDR, developing a settlement mechanism by private sector is not plausible due to uncertainty of business opportunity in SDR-denominated assets. Public institutions could endorse the settlement agent function and technically outsource the clearing function to a third party if necessary (see Section II C. for a more detailed discussion on settlement systems).

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<sup>2</sup> ADB's after swap composition is USD 87%, JPY 10%, and others 4%. World Bank hedges all issuance back to USD LIBOR.



*Implications and solutions.* A number of implications and possible solutions were put forward for the problems mentioned above. Specifically;

*Liquidity.* Liquidity was singled out as the most important pre-condition to enhance the use of the SDR and to develop a market for SDR-denominated asset. Options to enhance SDR liquidity include: i) presence of market-makers that should be obliged to provide bids for the SDR-denominated assets (in the early stages of market development, a public sector institution(s) needs to take this role); ii) liquidity guarantees in the form of buy-back provisions (put options) among the terms of the SDR-denominated debt instruments or repo facilities (see section II B for details); and iii) development of funding and hedging tools such as repos and derivatives.

*SDR interest rate.* The development of diverse SDR-denominated assets in terms of coupon and maturity would help investors adopt various investment strategies and actively participate in the SDR market. This is critical for investors to mark-to-market their SDR assets and therefore adjust their positions effectively. Therefore, the ultimate goal should be a full-term maturity structure. However, it will take much effort and time to develop the entire yield curve. Therefore, a reasonable approach would be to target development of the SDR money market as a first step, while pursuing the development of a longer-term fixed income market as a long-term goal. The regular publication of SDR-basket interest rates will help to enhance price transparency of SDR-denominated assets. In particular, it would be preferable to set daily SDR interest rate, rather than weekly, to allow the private sector fair valuation of SDR assets on a continuous basis. However, the lack of appropriate daily instruments in underlying currencies remains a constraint.

*SDR basket composition.* A sudden change in currency composition may bring unexpected foreign exchange risk to some reserve managers or private investors (e.g., inclusion of a new currency to which a specific investor does not want to have an exposure, inclusion of currencies which are not freely convertible). Adjustment to the basket composition should be made more transparent with sufficient lead time between the time of announcement and actual change to allow market participants time to adjust their portfolios.

## **II. Technical Issues Regarding SDR Infrastructure**

***This section elaborates on the technical and market infrastructure issues that are required for market development (SDR interest rates, liquidity provision, and settlement systems).***

*Public sector's initiative would be critical in building the necessary infrastructure for market development. The private sector would be reluctant to take the lead in creating an SDR market without public sector initiative and support. Section II.D provides estimates of the liquidity premium that would likely be required at the initial phase of market development. Existing studies have not generated reliable estimators for the liquidity premium. However, staff's calculations, using the lower-rated investment grade/higher*

*quality high yield market as a benchmark, suggest a liquidity premium around 80–100 basis points.*

### **A. SDR Interest Rates**

It is impossible to accurately replicate or hedge the SDR risk due to the mismatch between the maturity structure of the interest rate basket (3-month interest rates), and the weekly fixing of SDR.<sup>3</sup> While this is clearly a problem, from the investors' point of view, an even bigger problem is that the (current) SDR practically does not have a maturity at all, i.e. it resembles a checking account that pays the interest on the balance (or deducts an interest payment if the balance is negative) on a quarterly. Some market participants suggested matching the maturity of the interest rate basket with the fixing frequency (e.g., 3-month rate with 3-month resets or 1-month rates with 1-month resets). However, this would result in deviations of the SDR rate from underlying currencies, which cannot be arbitrated under the current system.<sup>4</sup> Conversely, the shorter the resetting period, the less of an issue this would be, suggesting the superiority of daily fixings of an overnight rate. An overnight rate would also be necessary to enable market participants to mark-to-market their SDR instruments, which in turn is necessary for any secondary market to develop.

### **B. Liquidity Provision**

Deep and liquid secondary markets in SDR-denominated instruments may take a long time to develop. Public sector and/or IFI liquidity support would be necessary at least initially. An obvious way for such development would be for official institutions to commit to act as market makers, i.e., provide two-way prices. Alternatively or complementarily, liquidity

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<sup>3</sup> There are also some issues with the lack of 3 month interest rate in EUR that would be equivalent to 3 month interest rate in other constituent currencies. An alternative to the currently used Eurepo rate could be a (weighted) average of the largest and most liquid government T-bills in Europe (i.e. at least Germany and France) to make it more consistent with the other constituent currencies.

<sup>4</sup> The problem with this proposal could be explained by the following example: suppose on August 1 the SDR interest rate is 'fixed' (taking the 1-month rates of the underlying currencies) at 2% for the next month (i.e., it is fixed until September 1). If on August 2 the underlying interest rate dropped to 1.5% (obviously unlikely, but let's assume that for the sake of argument), everyone would now have a strong incentive to go long in their balance of SDR as they are getting so much more for the 29 days than the market in the underlying currencies would offer, and conversely anyone with a negative balance would try to close out the position, i.e., would not be willing to borrow at 2% if they would be able to do it at 1.5%. The longer the fixing period the bigger this problem would become, not only because rates can move more, but also because of the term premium (assuming an upward sloping yield curve): even if the rates stayed constant and the SDR interest rate was fixed for, say, 3 months, after 2 months you could invest for 1 month at a 3 month rate, which would be higher than the underlying 1 month interest rates given the yield curve.

could be guaranteed by repo facilities and/or by embedding put options in SDR-denominated securities.<sup>5</sup> These are discussed in more detail below.

**Repo facility.** Credible institutions (e.g., IFIs) could provide a repo facility, through which pledging of SDR assets as collateral, would enable investors to receive convertible currencies immediately. This type of repo facility could draw from the experience and design (e.g., agreements, haircuts, margin calls, etc.) of the repo facilities operated by most central banks in the conduct of their monetary policies. The best placed entities to provide this type of facilities would obviously be the issuers of reserve currencies who can create the liquidity needed. Otherwise, an IFI for example, would have to deliver the liquidity through liquidity buffers or pre-agreed borrowing arrangements with their member countries.

**Put option.** Another way to improve liquidity of SDR-denominated securities would be to embed a put option on them, i.e., give the right but not an obligation to sell the security back to the issuer at a predetermined (strike) price. Puttable bonds typically have a lower yield than bonds without put options because of the value of the put option in case interest rates rise. However, given that the put option would be needed only to guarantee liquidity at all times and not to protect investor against a rise in interest rates, the design for the puttable SDR securities should be different from a traditional puttable bond, specifically:

The put option should be able to be exercised at any time, not only on or after certain predetermined dates in the future. The strike price should be linked to current market prices (underlying interest rates), i.e., be variable, not a predetermined price.

These two design features would effectively eliminate the interest rate sensitivity and time values of the put option leaving, just the value that is due to the guaranteed liquidity. To discourage investors ‘exploiting’ the use of the put option, the strike price should be below the current market value by a predetermined margin or a fee. Alternatively, if the IMF were to issue SDR bonds, the right to exercise the put option could be linked to the requirement of a balance of payment need, similar the current IMF notes, which effectively are both puttable and callable.

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<sup>5</sup> Note that these should be seen as ‘temporary measures’ to kick start the market. If these were permanent features in IFI issuance, they could hamper the development of private markets.

### C. Settlement Systems

***Preconditions for effective SDR settlement system.*** A SDR clearing and settlement system, open to participants worldwide, would be a large value payment system, probably of the net type, as opposed to a Real Time Gross Settlement System, which would require high liquidity. Several settlement cycles during the day could be envisaged to reduce settlement risk and bring settlement finality during the day. It would be tiered-based to achieve efficiency and to limit the number of accounts open in the books of the settlement agent. Two different approaches are possible: either a three-tiered system, or a two-tiered one.

- In a three-tiered system, only central banks would be allowed to hold SDR settlement accounts in the settlement agent books; they would need to open SDR accounts to clearing banks, which, in turn would open SDR accounts to their clients.
- In a two-tiered system, clearing banks and central banks would open accounts in the books of the settlement agent, and clearing banks would open SDR accounts in their books to their clients.<sup>6</sup>

Four basic functions would be needed:

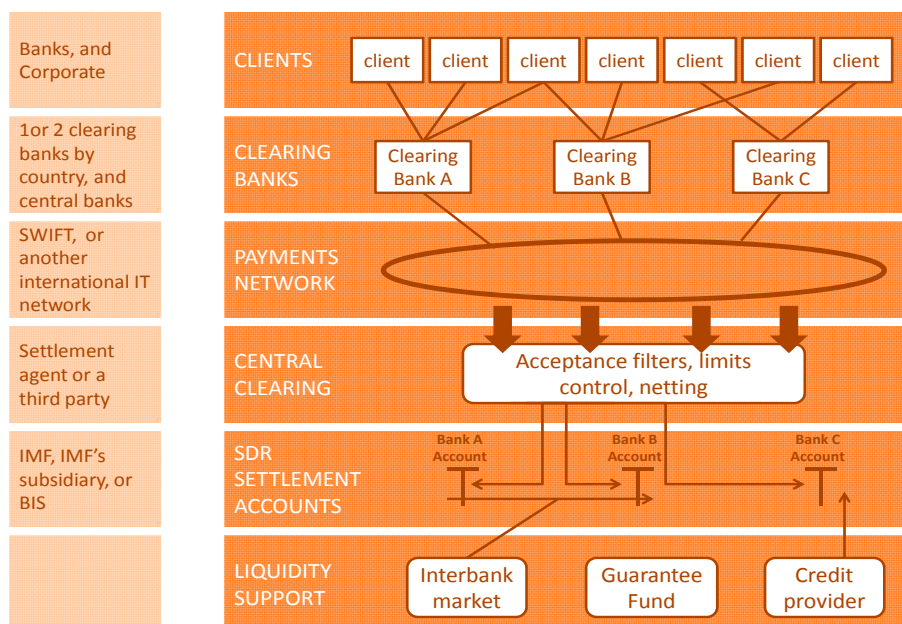
- A settlement agent function, by which the final settlement of the payments takes place in SDR settlement accounts, which cannot be in a debit position without a credit facility;
- A clearing function, by which the individual payments are accepted/rejected, processed and netted;
- A message transportation function, which allows banks and central banks to send/receive payments worldwide;
- A liquidity provider function, to ease the funding process at the time of settlement, in case a clearing bank has a net debit obligation that would exceed the balance in its SDR settlement account. If the clearing agent is also the liquidity provider, then any bank presenting to the clearing system a debit in excess of its deposit with the system can borrow to cover the difference.<sup>7</sup>

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<sup>6</sup> Some central banks may also want to offer SDR accounts to clients, at least the Government.

<sup>7</sup> In the absence of a credit facility, the settlement agent may need to unwind the original net positions, drop out some of the payments that would be delayed at least until the next day, and recalculate new net multilateral net positions. This should be done before the end of the day cut-off of the system.

**Figure 1: The SDR Clearing and Settlement System—Two-tiered System**



***Institutional arrangement for settlement system.*** The settlement and clearing functions require a highly integrated technical and organizational structure, which is best achieved with both functions performed by a single entity; namely, the settlement agent. A true multilateral clearing system should have at the head an agent that would not only act as master clearer for the entire system, but also would provide prestige and authority to the system and would ensure against any tendencies to privilege or monopoly. In the absence of a central bank, the liquidity provider function would normally be performed by the interbank market. However, since it is unlikely that such a market will be very large and active, other solutions would be needed. One example is the ECU clearing system, where the clearing banks implemented a component currencies exchange system that was operated outside the clearing, coupled with an interest rate fixing mechanism for intra-clearing borrowings (see below). In addition, the IMF could envisage providing a kind of safety valve or flexibility to the system, extending limited, short-term covered credits, for example on a swap basis (SDR window). Finally, a guarantee fund should be implemented, mainly to cover a potential participant's default, but also to face transitory liquidity shortages. The experience of the ECU clearing system could be examined in detail to provide lessons for SDR clearing system. A number of technical and institutions issues would also have to be resolved, including ownership, financing, and oversight of the system; compliance the CPSS Core Principles; and hours of operations and maintenance since SDR clearing system would be a global system covering all time zones.

#### **D. Liquidity Premium on SDR Assets**

The market for any SDR-denominated instruments will be subject to a liquidity premium, stemming from a lack of market makers and higher trading costs, hesitancy of initial

investors, and unfamiliarity with the new instruments. Based on previous experience, this section provides some indicative estimates of the size of a liquidity premium in a newly-created SDR-securities market.

Estimates of liquidity premia were derived from four sources: Academic studies of liquidity premia in the U.S. Treasury market, studies of U.S. corporate bond market liquidity, a comparison of instruments with different liquidity characteristics, and examples of liquidity premia during establishment of new sectors of the fixed income markets. The comparison of yields of short Treasury notes with the yields of same-maturity Treasury bills indicates a significantly higher yield for the older, less liquid notes, of almost 40 basis points after inclusion of brokerage costs. In the corporate market, liquidity premium have been estimated to be between 50 basis points for highly rated investment grade bonds to about 1% for triple-B rated securities. A liquidity premium of around 1 percent was also found for single -B to double -B High Yield bonds. Table 1 provides a summary of the results.

First, we compared three bonds with nominal bonds of similar maturity and credit quality, but of different issue size, two £-denominated bonds, and one €-denominated issue. The £-denominated bonds trade about 25 basis points over the same maturity Gilts, the €-denominated issue traded 35 basis points over a German government bond of similar maturity.

Further, we consider examples of the startup of new sectors of the fixed income markets. The first relates to the inception of the highly rated part of the Credit Card ABS market in the U.S. in the late eighties. Those securities started out with a spread of 150 basis points over LIBOR, and 15 years later were trading at or below LIBOR. It should be noted that in all of the above cases there is a credit element to the spread. The liquidity premium has been shown to increase generally with deteriorating economic conditions, while the credit of the EBRD is different from that of the U.K. or Germany. LIBOR itself has a credit element to it.

The second fixed income securities market is the market for U.S. Treasury Inflation Protected Securities (TIPS). While there is no credit differential, in the TIPS market expected inflation and an inflation risk premium enter instead. The paper by D'Amico, Kim, and Wei (2010) estimates the liquidity premium to have been about 1 percent. The startup of the TIPS market also provides a cautionary tale. It took about four years after the market inception in early 2007 for larger pension funds to incorporate TIPS formally into their strategic asset allocation, and subsequently to buy them in size.

Looking at the evidence from various fixed income markets, based on a variety of approaches, we estimate the lower bound of the liquidity premium at 25–30 basis points for a functioning SDR-securities market. A premium of that size can be expected to persist over an extended period. At market inception, such a premium could easily exceed 1 percent.

The initial cost of a regular program of issuance would therefore be costly for the first few years. For example, a 1 percent spread paid on a 5-year note, with duration of about 4.7 years, would have a capitalized cost of slightly less than 4.7 percent of the original

issuance amount. For the 2-year note, an 80 basis point spread would mean a capitalized cost of almost 1.6 percent of the issuance amount.

**Table 1: Summary of Bond Market Liquidity Indicators****Treasury Market Studies**

There have been numerous studies being published on Treasury market liquidity, spanning different types of bonds, methodologies, and datasets. We mention two general results:

Liquidity risk in the Treasury bond market is priced

Bond market illiquidity increases during times of economic stress.

Amihud, Y. and Mendelson, H (1991): *Liquidity, maturity, and the Yields on U.S. Treasury Securities*, Journal of Finance, pp. 1411–1425.

Same maturity Treasury bills and notes are compared. The more highly liquid bills are found to carry lower yields than less liquid notes.

The liquidity premium of notes over bills was found to be 39 basis points annualized, and to decrease with maturity.

Goyenko, R., Subrahmanyam, A., and Ukhov (2010), A., *The Term Structure of Bond Market Liquidity*, Working Paper, Mc Gill University

On-the-Run Securities are compared with Off-the-Run securities across the maturity spectrum.<sup>8</sup>

Changes in illiquidity are found to cause economically significant return variations.

**Corporate Bond Market Studies**

There have been numerous studies being published on corporate bond market liquidity, spanning different types of bonds, methodologies, and datasets. Three general results:

Liquidity risk in the corporate bond market is priced (i.e. nondiversifiable)

It is of significant relevance for corporate bond pricing

It is, on a relative basis, of greater importance for more highly rated corporate bonds, although lower rated bonds' returns are more affected by it on an absolute basis

Source	Summary	Results
Chacko, G. (2006): <i>Liquidity Risk in the Corporate Bond Markets</i> , Working Paper, Harvard Business School,	This empirical study uses data from three sources, including a major custodian. It develops a measure called 'Latent Liquidity', which we think provides a more realistic representation of bond market liquidity than other approaches.	For a BBB-rated issuer in the period from early 2000 to early 2003, the liquidity premium was found to be between 70–100 basis points, at times equaling the pure credit risk.

<sup>8</sup> On-the-Run treasuries are the most recently issued Treasury security of a particular maturity. They usually have the highest liquidity. Off-the-run securities are Treasury securities which have been issued before the most recent on-the run of the same original maturity. They will usually carry a higher yield than the On-the-Run associated with that security. This additional yield is usually associated with the higher liquidity of the On-the-Run security.



De Jong, F., and Driessen, J. (2005): <i>Liquidity Risk Premia in Corporate Bond Markets</i> , Working Paper	Corporate bond liquidity is priced explicitly together with equity and treasury market liquidity.	For U.S. long maturity investment grade bonds, the liquidity risk premium is around 0.45%, for High Yield bonds around 1%.
<b>Evidence from Markets with Similar Quality Debt</b>		
Comparison of two £-denominated bonds: EBRD 6/2032 vs. U.K. Gilt Comparison based on quotes from Bloomberg on 8/25/2010	This is a direct, model-free comparison of debt of the same maturity, and similar credit quality.	EBRD bond at Gilt Yield + 24 basis points
Comparison of two £-denominated bonds: EBRD 12/2028 vs. U.K. Gilt Based on quotes from Bloomberg on 8/25/2010	This is a direct, model-free comparison of debt of the same maturity, and similar credit quality.	EBRD bond at Gilt Yield + 25 basis points
EBRD of 12/1/2025 vs. Ger 1/2024 Comparison based on quotes from Bloomberg on 8/25/2010	This is a direct, model-free comparison of debt of the similar maturity, and similar credit quality.	EBRD bond at German Yield + 35 basis points
<b>Inception of the triple-A Credit Card ABS Market (1988/89)</b>		
Inception of the triple-A Credit Card Asset Backed Securities (ABS) Market in 1988/1989. The data here are based on an interview with a market participant.	Here we compare quoted market spreads at inception of a market with spreads when that market has matured. Generically, LIBOR is associated with a double-A minus financial credit, so the triple-A Credit Card securities represented superior credit compared to LIBOR. It should be noted that those types of ABS were never subject to the same issues that subprime mortgages bonds had experienced.	The market started out at a spread of about 1.5% over LIBOR (estimated), or roughly 180 basis points over Treasuries. Many triple-A rated Credit Card ABS bonds reached spreads of below LIBOR in 2004.
<b>Inception of the U.S. TIPS Market (1997)</b>		
D'Amico, S., Kim, D., and Wei (2010), M, <i>Tips from TIPS: the informational content of Treasury Inflation-Protected Security prices</i> , Finance and Economics Discussion Series, Federal Reserve Board	The importance of the liquidity premium for the pricing of TIPS is clearly established and estimated.	The liquidity premium for TIPS is estimated to be about 1%. Albeit initially positively received, TIPS lost value versus a similar-maturity Treasury Note for the first 19 months of the program's existence.

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