

# Venture Development Bonds

Executive  
Summary

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# 1 Introduction

Developing countries need significant capital inflows from abroad to finance domestic public investments and, in particular, to build-up their public infrastructure. This is an important prerequisite for boosting long-term economic growth.

Developing countries typically exhibit a relatively high risk of default which is mirrored by low ratings from international rating agencies such as e.g. Moody's and Standard & Poor's. Empirical studies have found that this default risk depends significantly on the short- and long-term development of a country's gross domestic product (GDP). This means, that investors in emerging market bonds are affected by default risks which fluctuate in relation to news about future GDP.

A common instrument for financing public debt is the fixed-coupon bond ("straight bond"). The interest and redemption payments on these bonds are fixed in advance and are therefore independent of the state of the economy. As a consequence changes in the business cycle and long-term growth prospects do not translate into changes in a country's debt service.

A recent study by Borensztein/Mauro (Reviving the Case for GDP-Indexed Bonds, IMF Policy Discussion Paper, PDP/02/10, 2002) has renewed interest in so called GDP-linked bonds. In their definition, these bonds tie the coupon of a bond to the year-on-year changes of GDP: if economic growth is low, the bond coupon decreases; if GDP rises strongly, so does the coupon. Thus, in contrast to straight bonds, GDP-linked bonds take ex-

PLICIT account of GDP development rather than simply doing so implicitly in relation to the expected default risk of market participants.

In contrast to Borensztein/Mauro (2002), our study covers a much wider range of bonds. GDP-linked bonds cannot only be tied to short-term variations in GDP but also to long-term changes: coupon and/or redemption could be linked to the development of GDP during the time to maturity. Thus, GDP-linked bonds are able to consider temporary business cycle effects (as in Borensztein/Mauro), but also the medium- and long-term development of the economic conditions of the issuing country.

Our study also considers the possibility of public guarantees provided by an international organisation such as the World Bank, for example, that partly insure the default risk of the bond. Although such public guarantees are not a necessary attribute of GDP-linked bonds, they could help to introduce these bonds on international capital markets.

In our study the term "venture development bonds" (abbreviated to VDBs) is used instead of "GDP-linked bonds". This should emphasise that this new type of bonds exhibits some characteristics of equities or venture capital finance, namely participation in economic performance. Nevertheless, the specific aim of VDB bonds is to improve development finance and in particular to increase the use of and access to capital markets by developing countries.

## 2 Characteristics of VDBs and Investors

### 2.1 Theoretical Aspects

#### Past experience with similar financial instruments

The idea of linking bond payments to macroeconomic data is not totally new. This topic has been discussed in the theoretical literature since the early 1980s. In practice, however, only inflation-indexed bonds have become widely accepted. Financial instruments linked to economic performance have very little significance in practice: Mexico and Venezuela issued some Brady Bonds linked to the oil price; Costa Rica, Bosnia-Herzegovina, and Bulgaria issued Brady Bonds linked to GDP.

#### Classification of VDBs within the framework of financial theory

From the perspective of financial theory, VDBs can be regarded as a form of mezzanine capital or as hybrid financial instruments. While the basic structure resembles debt capital – capital loaned for a limited time period, periodical coupon payments, redemption at maturity, no ownership rights associated with VDBs – they exhibit certain equity characteristics as well. The dependence of the amount of payments on the performance of the country – central characteristic of VDBs – is in fact typical of the profit participation function of equity.

To better understand how VDBs work, it is helpful to replicate this new financing instrument along the lines of conventional financial instruments. In this context it can be shown that VDBs can be synthetically created by combining conventional government bonds and financial derivatives. At its simplest, the financial derivative used is a forward on the development of the country's GDP. In modelling, it should be noted that a separate forward must be created for each individual payment to be indexed. Depending on the structure of the VDB, a call option for the investor (floor on the coupon payment and/or the capital repayment) can be used instead of the forward.

### 2.2 Results of the Interviews with Financial Experts

In addition to theoretical considerations it is necessary to ask market participants and – in particular –

potential future investors in VDBs in order to get a proper assessment of the prospects of success of this new type of bond. 21 interviews were therefore carried out in which the interview partners (from private and public banks, investment companies, insurance companies, rating agencies, tax advisors) provided detailed information about what they considered to be desirable VDB characteristics.

The major result of these 21 interviews – conducted either face-to-face or by phone – is that under certain conditions GDP-linked bonds can be successfully issued and traded on international capital markets.

#### ■ Potential Investors

Venture Development Bonds are a suitable investment vehicle particularly for institutional investors such as insurance companies, emerging market bond funds and hedge funds. These types of investor are able to understand the relatively complex product characteristics and to price bonds correctly.

In contrast, private investors will probably not hold VDBs directly given that their pricing is more complex than that of straight bonds. In some countries, e.g. in Germany, private investors would also suffer from a tax disadvantage as VDBs are regarded as so called financial innovations. This means that the capital gains as well as the coupon are taxed.

There are also some minimum standards that VDBs have to fulfil to meet the investment criteria of some groups of institutional investors. For example, German insurance companies and pension funds would only invest in VDBs if they were not rated below investment grade-level (e.g. BBB- in terms of Standard&Poor's).

#### ■ Features of the Bond

##### – Simplicity of Construction

VDBs should be constructed as simply as possible. The easier they are to understand and price, the higher the demand for these bonds.

##### – Economic indicator for Indexing

In general, the parameters for indexing VDBs may be the GDP (real, nominal), export earnings, tax revenues, and possibly certain key commodity prices. With regard to the aim of these bonds, i.e. the link-

age of the debt service payments to the economic development of the issuing country, a linkage to real GDP is preferable.

#### – Indexing Method

It is possible to index coupon payments and/or capital repayments. In theory, there is no preferred method of indexing. In practice, the indexing method applied for inflation-indexed bonds is well understood and accepted by capital markets. Thus, this mechanism is also recommendable for GDP-linked bonds.

#### – Payment Floors and Ceilings

A floor or ceiling may be applied to both coupon and capital repayments. Both features change the yield of the VDB and effect the performance of the bond. But these additional characteristics complicate the pricing of VDBs and reduce demand by investors.

#### – Time to Maturity

A balance must be struck here between long times to maturity, which permit the whole economic cycle of a country to be considered, and shorter times to maturity, which result in less default risk for investors. In principle, embedding an option to extend or reduce the time to maturity is conceivable. But again, the introduction of such an option would make pricing more complicated and would reduce market liquidity.

#### – Currency

The bond can be issued in local or hard (dollar, euro, yen) currency. However, if the bond is denominated in local currency, foreign investors will bear an additional currency risk or additional hedging costs.

#### – Public Guarantee of the Capital Repayment

While a partial public guarantee of coupon payments and/or redemption by e.g. an international organisation such as the World Bank reduces the default risk borne by investors, it also decreases the expected returns. Thus, a public guarantee might be preferable for some investors (e.g. insurance companies) as the guarantee increases the rating of the bond. Other investors, such as emerging market bond funds, will prefer to bear a higher default risk and earn a correspondingly higher risk premium.

### ■ Bond Issue and the Secondary Market

#### – Target Countries

All developing and emerging market countries are potential issuers of VDBs. However, some countries may not be suited as issuers due to their inability to access the capital market as a result of inadequate ad-

ministrative infrastructure or social instability. Irrespective of the use of VDBs for development financing, as examined in this project, it should be noted that, in principle, high-rated industrial nations are also potential issuers.

#### – Monitoring calculation of indicators

In order to enhance the credibility of the bond, an international financial institution (such as the World Bank) could monitor the calculation of real GDP to ensure its accuracy. As a low cost alternative to monitoring, the issuing country could subscribe to the IMF's Special Data Dissemination Standard (SDDS).

## 2.3 Conclusions

Table 1 summarises the main results of the interviews and of our own conclusions.

In general, emerging market bond funds and hedge funds may be interested in investing in VDBs depending on the VDB characteristics in each case.

As regards product characteristics, the interviewees largely agree that institutional investors would be able to price VDBs. Nevertheless, it would be advisable to have a construction which is as simple and transparent as possible in order to facilitate a positive reception by the capital market and above all liquid trading.

A public guarantee of payment flows provided, for example, by the World Bank is necessary only to the extent that this would ensure the marketability of VDBs. Insurers and pension funds do however attach importance to an investment grade rating. If VDBs are to be targeted at these types of investors, a guarantee is needed which at least ensures a rating of BBB-

Suitable debtor countries are above all countries without access to the capital market. A joint issue by several countries could be helpful in order to ensure a sufficient issue volume. It would also be advisable to choose a hard currency as the issuing currency.

In order to improve marketability it would be particularly important to ensure that national account statistics were monitored by an external, neutral institution such as the IMF or World Bank. This is the only way of ensuring adequate confidence in the reliability of the figures provided by the debtor country. A low cost alternative would be adoption of the IMF's Special Data Dissemination Standard (SDDS) by the debtor country.

Extensive marketing activities are also very important if VDBs are to be successful on the market. It would be very helpful if international organisations

such as the IMF and World Bank were to actively support the issue of VDBs and seek to persuade the major groups of investors to purchase VDBs.

Table 1: Important characteristics of Venture Development Bonds, classified by types of investor

	Life Insurers and Pension Funds (restricted assets)	International Bond Funds	Banks and Hedge Funds (as well as life insurers and pension funds (other restricted and free assets))
Rating	Investment grade (at least BBB-).	Any rating. Many emerging market investors prefer low ratings in order to increase the expected returns.	
Liquidity of VDB	No so important. Private placement also possible.	Very important.	Very important. Exceptions: loan exposures of banks, hedge funds, life insurers and pension funds.
Issuing Volume (to ensure market liquidity)	At least € 250 million, preferably € 500 – 1000 million. A basket approach might be suitable (= joint issuance by two or more countries)		
Securities Exchange Listing	Necessary.	Not necessary, but advisable.	
Public Guarantee of the Payment Flows	Needed to achieve an investment grade rating.	In principle not important, could even be counter-productive, since the guarantee would cause the expected return to be lower. Useful to ensure marketability in the case of countries without access to capital markets.	
Type of Indexing	100% of nominal amount must be repaid.	Any type. Forward or call on GDP would be suitable.	
Floor of the Coupon Payment	Coupon must not become negative.	Floor may be useful to safeguard investors.	
Ceiling for Coupon Payment	Not useful.		
Currency	Hard domestic currency needed.	In principle not important. However, local currency should be hedgeable. Local currency above all when the bond is marketed in the country itself, hard currency for international issues.	
Option of Shortening/ Extending the Time to Maturity	Not advisable. Needlessly complicates the evaluation of the bond and quite considerably reduces its usefulness to the investor.		
Time to Maturity	Not fixed. Should cover at least one business cycle (about 10 years). Should be shorter (up to five years) for a country with a poor rating.		
Type of Country	Countries which have previously had very little access to the capital market.		
Monitoring of GDP Statistics	Important as a rule. The measuring of GDP should be monitored by a neutral external organisation. Adoption of Special Data Dissemination Standard (SDDS).		



## 3 Quantitative Assessment of Venture Development Bonds

### 3.1 Simulation of VDB Prices

As Venture Development Bonds are a new class of bond, pricing behaviour and performance cannot be investigated directly. Therefore, in this study, prices of different types of VDB are simulated and compared to straight bonds and international bond indices.

All simulated VDBs are connected to real GDP. The calculations are based on quarterly data. The following two types of GDP-linkage of the coupon are considered:

$$\text{Type 1: } \text{Coupon}(t) = \frac{\text{FixedCoupon}(t) * \text{GDP}(t)}{\text{GDP}(t_0)}$$

$$\text{Type 2: } \text{Coupon}(t) = \max[\text{FixedCoupon}(t) + \text{GDPgrowth}(t) - \text{average GDPgrowth}(t_0); 0]$$

The period  $t$  refers to the date of the coupon payment whereas  $t_0$  indicates the date of the issuance of the bond.

With respect to *type 1*, the coupon is equal to a fixed coupon times the GDP in the current period  $t$ , divided by the GDP-value at the date of the bond issuance. Thus, the coupon payment is linked to the change in economic development during time to maturity.

The second type of coupon (*type 2*) links a fixed coupon with quarter-to-quarter changes in GDP (= *GDP-growth*). The average quarter-to-quarter GDP growth rate at the date on which the bond is issued is calculated for the 10 year period (= 40 quarters) prior to  $t_0$  and held fixed afterwards. This average figure serves as a correction term for the adjustment of the coupon payments. The *type 2*-coupon payments are either equal to the formula (if the value is positive) or zero.

In contrast to the proposal made by Borensztein/Mauro (2002) the *type 2* coupon construction uses quarter-to-quarter changes in GDP, whereas Borensztein/Mauro propose the year-on-year changes. The use of *type 2* has the advantage of a faster reaction of the coupon payments to GDP changes compared to the proposal of Borensztein/Mauro. But when yearly data are used in the *type 2*-formula (instead of quarterly data) both approaches are identical.

In a new version of their paper (The Case for GDP-Indexed Bonds, [http://www.entelugieinaudi.it/pdf/Seminari/Economia/S\\_20031020.pdf](http://www.entelugieinaudi.it/pdf/Seminari/Economia/S_20031020.pdf)), Borensztein and Mauro propose two additional linkage mechanisms which are much more complicated to price. As this would certainly impede the reception of VDBs by the capital market, our simulations are only based on the two types of coupon-linkage described above.

In addition, redemption payments could also be linked to economic development. Our simulations consider the following three types of redemption payments:

1. *Redemption at par*. In this case, only the coupon payment is linked to GDP, either to GDP development during time to maturity (*type 1*) or to the quarter-to-quarter change (*type 2*).

2. *Redemption is linked to GDP development during time to maturity*. The redemption payment is therefore symmetrically linked to GDP development and can be above or below par.

3. *As above (no. 2), with the difference that redemption payment is always equal or above par value*. The floor has been constructed by using a call option on GDP development. This variant is particularly useful for a VDB with a short time to maturity.

In cases 2 and 3, the coupon payment is linked to GDP during time to maturity (*type 1*).

These different VDB variants are simulated either with or without a public guarantee of redemption payments by an international organisation. In the case of a public guarantee, 70% of the redemption value is insured (as an example). Thus, we simulate the prices of 8 different types of Venture Development Bonds:

- VDB1: Coupon linked to GDP development (i.e. relative to GDP at date of issuance), redemption at par (= 100).
- VDB2: Coupon and redemption linked to GDP development (i.e. relative to GDP at date of issuance).
- VDB3: Coupon and redemption linked to GDP development (i.e. relative to GDP at date of issuance). In addition call option to guarantee redemption which is at least at par.

- DB4: Coupon linked to GDP growth (i.e. quarter-to-quarter change of GDP), redemption at par.
- VDB5 – VDB8: as above VDB1 – VDB4, but combined with a partial public guarantee (70%) of the redemption payment.

The VDB price simulations are based on selected historical government bonds issued by different countries. Using the interest rate and bond database of Professor Bühler from the University of Mannheim, we chose 8 bonds from 5 countries: Brazil, Indonesia, Mexico, Turkey and Venezuela. All bonds are denominated in German mark or euro. Table 2 gives an overview of these bonds.

### 3.2 Evaluation of Performance- and Cash Flow-Sensitivities to Changes in GDP

#### Analysis of the performance sensitivities

The performance of VDBs (as measured by the total return index) is one of the most important investment criteria. To shed light on the pricing mechanism for VDBs the sensitivities of VDB prices are investigated using simulations based on different artificially generated GDP developments.

Such a simulation has two advantages. Firstly, the influence of all possible GDP-scenarios can be analysed. Secondly, the influence of external factors (such as con-

Table 2: Selected Government Bonds as Basis for VDB Price Simulations

Country	WKN	Date of Issuance	Start of Time Series	Maturity	End of Time Series	Coupon (in %)	Current Rating
Brazil	614414	7/5/00	8/18/00	7/5/05	12/30/02	9,0	B+
	607749	1/24/01	1/24/01	1/24/11	12/30/02	9,5	B+
Indonesia	485500	10/27/88	12/29/88	10/27/93	10/11/93	6,375	B
Mexico	402280	3/31/91	9/23/92	3/13/96	2/26/96	10,5	BBB-
	130890	1/29/96	4/2/96	1/29/03	12/30/02	10,375	BBB-
Turkey	485678	11/8/88	12/7/88	11/8/95	10/23/95	6,5	B+
	129180	8/21/95	12/21/95	8/21/98	8/5/98	8,0	B+
Venezuela	411810	10/15/93	12/20/93	10/15/00	9/29/00	8,25	B-

The simulations use the prices of these government bonds and GDP data for the countries to calculate prices of synthetic VDBs.

Criteria for the selection of these government bonds have been:

- potential VDB issuer countries,
- different world regions,
- different time periods,
- availability of bond prices in the interest rate and bond data base of Prof. Bühler, University of Mannheim.

The next step has been the construction of total return indices based on the realized and simulated bond prices. The total return indices include all interest payments and, thus, represent the total return to an investor who invests in a specific bond.

tagion effects or rumours on capital markets) can be eliminated.

The simulation is constructed as follows. The instrument of reference is a bond with a clean price of 100 and with a zero-default probability. Based on this bond, all kinds of VDBs are constructed for typical GDP processes (upward sloping, downward sloping or flat). Finally, surprising GDP changes (shocks) between the date of issuance and maturity are incorporated into the simulation.

One important result is that, without any shocks, all VDBs and the straight bond have the same total return. This holds because the yield to maturity (promised yield) is the same for all bonds under examination. Thus, in this simulation, no premium is added to the yields of VDBs which could be due to lack of liquidity, lack of publicity, higher cash flow uncertainty etc.

If shocks to GDP are applied, however, the results are no longer quite so straightforward. In general, VDBs

outperform straight bonds if there is a surprising increase in GDP, and underperform straight bonds if GDP declines unexpectedly. This is due to the changing cash flows of VDBs after the shock and the accompanying enhancement / degradation of the effective yield. Furthermore it can be seen that the bigger the leverage on the amount of cash still to be paid out after the shock, the more VDBs react to that shock. This means that usually option-free VDBs (VDB 2, VDB 6) exhibit the highest sensitivity, because all future payments (coupon and redemption) are affected by the GDP-change to the full extent. They are followed by VDBs with a floor on the redemption value at par (VDB 3, VDB 7). VDBs that are necessarily redeemed at par (VDB 1, VDB 5) usually show the weakest reaction.

VDBs that are linked to the GDP growth rate (VDB 4, VDB 8) react stronger than VDBs that are redeemed at par. However, no explicit statements regarding their performance relative to option-free VDBs and those with a redemption floor at par can be made.

#### Analysis of Cash Flow Sensitivities

This analysis is based on the same simulation techniques used for the analysis of performance sensitivity. The aim of this analysis is to find out under which circumstances a country benefits from issuing a VDB. This examination is supplemented by an exemplary look at two existing bonds.

Three results in particular are worthy of note. Firstly, the value of the initial coupon of the different VDBs crucially depends on long term GDP expectations: if market participants expect GDP to rise, initial coupons are very low (where low means lower than the coupon of a straight bond). This effect is stronger for option-free VDB (VDB 2, VDB 6) and is weak – but still exists – for VDBs due to be redeemed at par (VDB 1, VDB 5). This phenomenon can be traced back to the expectations of rising coupons (and probably of redemption over par) in the future. In this context it is important to remember that the initial coupons are determined in such a manner that the issuing prices of all VDBs equal the issuing price of the straight bond (which equals 100). For the same reasons the initial coupons are very high in the case of falling GDP expectations. If the market expects GDP to remain stable over the time period to maturity, initial coupons of VDBs are generally equal to the initial coupons of straight bonds.

Secondly, in the case of shocks, the payment struc-

ture changes as expected: positive shocks lead to an increase in coupons and/or repayment and vice versa. The sensitivity is especially high for those VDBs that are linked to the GDP growth rate (VDB 4, VDB 8).

Thirdly, the payments of VDBs that are directly linked to the GDP do not necessarily conform with the business cycle of the issuing country. This means that, in the case of a downturn, payments are probably still high and vice versa. In contrast, VDBs that are linked to the growth rate of GDP (VDB 4, VDB 8) do not necessarily conform with the paying ability of the issuing country, i.e. payment duties might be high due to a short term GDP upswing while in fact the GDP decreased since the date of issuance. Additionally, due to the high sensitivity of growth rate-linked VDBs, there is a danger of undesirable procyclical effects and, particularly if the determination of payments is based on year-to-year data, this lag might lead to a situation in which payments are still high while in fact the economic circumstances have already deteriorated.

The examination of VDBs constructed on the basis of existing bonds (exemplary: Venezuela and Indonesia) supports the significance of the conclusions drawn from the simulations.

### 3.3 Analysis of the Simulated VDB Prices

The total return indices of the simulated VDB prices are compared with the actual government bonds which served as the basis of the simulations and to three international bond indices from JP Morgan: a global index, a European index and an index of Brady bonds.

The results of the performance comparison show that out- or underperformance of the VDB depends strongly on the country chosen. But, depending on the time period, out-performance or underperformance may occur even in the same country (e.g. Brazil).

The returns (= logarithmic differential to the month before) for all the types of VDB taken into account correlate highly with the returns on the underlying straight bond.

With regard to returns, there does not appear to be a preferable type of VDB which is always or in most cases better than the other types.

The VDB and the underlying straight bond are close substitutes. An additional risk premium of a VDB must therefore be relatively small or even negative. This limits the potential market success of VDB.

Nevertheless, VDBs might be chosen by investors if the GDP of the issuing country has a negative or low positive correlation with the GDP of the reference region of the investor. If the investor holds an internationally well diversified bond portfolio, the correlations with world GDP are relevant. Borensztein/Mauro (2002, tables 1b and 1c, pp. 13-14) calculate inter alia the correlation between world GDP and the GDP of different developing countries: these correlations proved to be negative for Bangladesh, Egypt, India, Pakistan, Syria, Vietnam and one or two other countries. The risk premium for these countries might even be negative compared with straight bonds. Thus, from this point of view, such countries are possible candidates for the first issues of VDB.

To sum up, from the perspective of an investor VDBs are neither generally better nor worse than straight bonds. To improve the possibilities for the successful introduction of VDBs on international capital markets, the GDP of the candidate countries should exhibit a negative correlation to the GDP of the reference region of the investor.

### 3.4 Summary of the Empirical Analyses

The results show that VDBs can act as alternative investment vehicles compared to straight bonds. As the different types of VDB considered in this study have different characteristics, the question remains which type of VDB should be chosen by the issuing country.

Types of VDB which depend on the development of GDP during time to maturity (VDB 1-VDB 3 and VDB 5-VDB 7) exhibit a gradual increase in payments over time when expected GDP rises.

If redemption is also linked to GDP, payment at maturity may exceed par value by a very large amount. Although this pattern accords with an increasing ability to pay, if investors are to accept such patterns of payment they must have great confidence in the future state of a country's economy and its willingness to pay. These types of VDB are therefore only suitable for countries with a low probability of default and a corresponding-

ly high rating. The lower the rating, the shorter should be the time maturity.

If, in contrast, only the coupon payments are linked to the development of GDP (VDB 1 and VDB 5), the time to maturity may be longer as redemption will be at par value. In this case, payments are also linked to the ability to pay. If the time to maturity is relatively long, payments will only respond slightly to business cycle variations and will move in accordance with expected medium and long term growth.

If the aim is link coupon payments to business cycle changes, the coupon should be linked to quarter-to-quarter changes in GDP (VDB 4 and VDB 8). This type of VDB reduces the risk of the issuing country becoming insolvent during recessions.

However, a number of general problems associated with VDBs also become apparent. The analysis of performance sensitivities suggests that (*ceteris paribus*) investors prefer VDBs over straight bonds if they anticipate higher GDP growth than expected by the market. However, the analysis of cash flow sensitivities shows that it is only advantageous for a country to issue VDBs if it expects GDP to rise less than the market expects. Otherwise it would pay more or at least the same amount as for straight bonds. These two ambivalent results illustrate that it is likely to be very difficult to create a win-win situation for both issuers and investors.

An additional result is that countries facing declining GDP market expectations are less likely to issue VDBs because they have to pay high initial coupons relative to straight bonds. This means that the borrowed amount is significantly reduced immediately after the issuance date. However, investors will presumably not be willing to invest in VDBs issued by countries with very positive GDP expectations because the bond's payment structure would almost resemble the structure of a zero bond. Instead, investors tend to prefer high initial coupons owing to the lower risk associated with this payment structure. This trade-off also emphasizes the problems of bringing together the interests of issuer countries and investors with the new financing instrument VDB.

## 4 Regulatory assessment

### 4.1 Introduction

There would be no need for extensive regulation to cover the issue of VDBs which are not covered by any form of public guarantee as it would be up to markets to decide on the success of this innovation. A public guarantee (e.g. given by the World Bank), however, even though it may be beneficial for capital market access, must be classified as government intervention and as such needs further justification.

### 4.2 Experience with World Bank guarantees

Experiences with bond related World Bank guarantees exist in the context of so-called Policy Based Guarantees (PBG). These guarantees have been granted in recent years in relation to bonds issued by Argentina and Colombia. The objective of the PBG programme was to safeguard capital market access for countries with a promising policy record. The two PBG constructions have been designed as rolling guarantees covering only the most immediate payment obligations. Although the guarantees successfully simplified the issuance of the bonds, the scheme's reputation has been damaged by the subsequent Argentinean default. When Argentina defaulted on its World Bank guaranteed bond in October 2002, investors were compensated by the World Bank. However, as Argentina failed to compensate the World Bank for its guarantee payment within the prescribed deadline, the rolling over of the guarantee to the next payment stopped and the country defaulted on subsequent payments without receiving any privileged treatment this time round. This experience has damaged market confidence in the value of this type of rolling World Bank guarantee and also led to a rating downgrade of the similarly designed Colombian bond. If, therefore, VDBs are to be enhanced by a World Bank guarantee, the PBG can no longer be applied in its current, unmodified form.

### 4.3 Guarantees, VDBs and Capital Market Access

Experience with debut bond placements shows that the following factors are crucial for market access:

a favourable global situation in terms of high growth and low interest rates, promising macroeconomic development in the candidate country and a rating which, as a rule, should not be lower than BB. Debut bonds are normally constructed in a standardised way as fixed coupon bonds, typically with a five year maturity and without any enhancements. Minimum volumes are \$250m. and in most cases \$500m or more.

On the basis of this experience it would appear that a World Bank guarantee is not necessarily helpful for a country's first issue. The disadvantage of a (partially) guaranteed first bond is that it is of little use as a benchmark for future unguaranteed issues. Furthermore, the guarantee complicates pricing which is always a delicate task for a debut placement. The lessons for the suitability of VDBs as debut bonds are ambiguous. On the one hand, a favourable growth perspective which is critical for market access is at the same time particularly helpful as a sales argument in the case of VDB. On the other hand the VDB's unusual construction complicates pricing which could be a serious disadvantage for a debut bond.

### 4.4 VDB and Moral Hazard

The possible link between IMF/World Bank guarantees and the behaviour of creditors and debtors has been intensively discussed in the reform debate of the Bretton-Woods institutions. The empirical evidence with regard to both creditor and debtor moral hazard is mixed. There are indications that, at least temporarily, the perception of implicit IMF guarantees has had a significant impact on the interest rate spreads of emerging countries.

Moral hazards risks appear to be of minor relevance as far as partially guaranteed VDBs are concerned. As long as the explicit guarantee is only partial and private investors suffer losses exceeding 50 per cent of their capital in the event of default, there remain strong incentives for a careful risk analysis on the side of investors. With a VDB, debtor moral hazard is a theoretical possibility not only with a guarantee, but also without since low growth reduces the debt service due to the GDP-linked yield. Whether debtor moral hazard

is also of practical relevance is highly questionable as long as VDB issues constitute only a minor part of a country's debt. And even in this case, the substantial political costs of low growth will tend to outweigh any incentives for low growth.

A specific type of debtor moral hazard in the context of VDBs refers to the possible manipulation of national accounting data. In order to ensure investor confidence in the quality of such yield-determining data a VDB issuing country should subscribe to the IMF's "Special Data Dissemination Standard" which defines certain statistical standards and includes monitoring by IMF staff.

#### 4.5 Extent and Burden of Guarantee

A few calculations can help to assess the possible burden on a guarantor. On the basis of the link between rating classes and default probabilities it is possible to derive the guarantee ratios which are necessary to improve the rating of a country. The results show that guarantee ratios between 15 and 30 per cent can lift a bond by one rating sub-category – e.g. from B1 to Ba2. In order to lift a non-investment-grade bond into investment grade, investors would need guarantees covering between 25 and 50 per cent of capital in the case of a BB-bond.

A direct impact of World Bank guarantees for a number of VDBs on national budgets can be excluded. So far the World Bank has always worked profitably due to its successful risk management and its role as a de facto preferred creditor. As long as guarantees in favour of VDBs are not accompanied by deteriorating standards in creditworthiness checks and risk management, a direct negative impact on World Bank's owners is not realistic. Nevertheless, some calculations demonstrate that - depending on the rating class of the issuer – the World Bank would implicitly subsidise a guarantee. This can be shown by comparing the income from guarantee fees with the expected losses of

the guarantor associated with defaults. Our calculations indicate that – given its present level of guarantee fees – the World Bank is implicitly subsidizing guarantees in favour of non-investment-grade countries.

#### 4.6 Country selection

Candidates for VDBs are countries with favourable growth prospects as this is one of the VDB's key advantages from the investors' point of view. Furthermore, a rating is indispensable as it is the country's subscription to the IMF's Special Data Dissemination Standard. Countries lacking the creditworthiness required for eligibility for World Bank credits are too far off from capital market access to be VDB candidates.

#### 4.7 Conclusions on the role of guarantees

The idea of a VDB is in no sense conditional on a public guarantee although partial guarantees might be appealing for certain risk-averse investor groups. The most serious counter-argument against partially guaranteed VDBs results from the difficulties of debut bond issues. Due to information and pricing problems investors have a preference for conventional ('plain vanilla') bonds when a country offers its first issue. VDBs as such have a handicap in this situation which would even be aggravated by a guarantee. Moral hazard problems are only a minor concern in this case.

In spite of these problems, it may be worth considering a partial guarantee if a country is within close reach of capital market access. Any guarantee scheme applied in the context of VDBs should have a much simpler approach compared to the recent Policy Based Guarantees favouring bonds from Argentina and Colombia.

The limited involvement of the World Bank in this context would accord with the Meltzer Report, for example, which recommends that the Bank should change from a capital intensive creditor into a catalyst of private resource flows.

## 5 Summary and Conclusions

- **What are the special characteristics of Venture Development Bonds?**  
Debt service payments are linked to the paying ability of the issuing country.
- **Which factor should be used to link VDBs to economic development?**
  - GDP is preferable (high correlation with ability to pay).
  - Commodity prices if highly correlated with GDP.
- **What are the pros and cons of VDBs compared to conventional bonds?**
  - Pros:
    - Payments of the bond are linked to short- or long-term solvency.
    - Transfer of business cycle or growth risk from the issuing country to the investor.
  - Cons:
    - Risk transfer has to be rewarded by risk premium.
    - New capital market instrument which induces an additional risk premium (e.g. due to unknown price behaviour and liquidity risk).
- **Who are potential investors?** Institutional investors, in particular, emerging market bond funds, hedge funds, insurance companies, pension funds.
- **Which are the basic types of VDB?**
  - Linkage of coupon and/or redemption payment to GDP development (i.e. GDP relative to the GDP in the year of issuance).
  - Linkage of the coupon to GDP growth (e.g., year-on-year or quarter-to-quarter growth).
- **What are the additional features of VDBs?**
  - Option on coupon to guarantee that the coupon does not become negative.
  - Option on redemption payment to guarantee redemption at least at par.
  - Combination with a partial guarantee of the payments by e.g. an international organization.
- **Is a pro-cyclical effect on debt service payments possible?** Yes, a pro-cyclical change of coupon and/or redemption payments is possible. However, it depends on the publication lag and the GDP data frequency. The danger of a pro-cyclical effect is low for quarterly data, but relatively high for yearly data.
- **Should reporting of national account data be controlled by international organizations?** Yes, the reliability of national account data is essential to build-up confidence. Therefore, it is indispensable that the issuing country subscribes to the IMF's Special Data Dissemination Standard which defines standards and implies IMF staff monitoring.
- **How to cope with GDP revision?** VDBs should be based on revised and definite GDP data and not on the first reported GDP figures. This increases the publication lag but reduces incentives to misreport i.e. understate GDP systematically.
- **Which countries should issue VDBs?**
  - The GDP of the issuing country should have a low positive or even a negative correlation with worldwide GDP. This reduces the risk premium which investors demand as compensation for bearing GDP risk.
  - The issuer country should profit from the structure of the payments of VDBs and the specific form of risk transfer. VDBs are particularly interesting for countries expected to have temporary solvency problems in the future.
  - First-time issuers are at a disadvantage because both the country and the financial instrument are relatively unfamiliar on capital markets.
- **Is a partial public guarantee an important element of a VDB? Under which circumstances?**
  - On the one hand, any guarantee complicates pricing and reduces the bond's usefulness as a country benchmark.
  - On the other hand, a partial guarantee probably helps to balance the interests of investors (in

terms of the risk-return relation) and the paying ability of the issuer country.

- A partial guarantee may, however, be worth being considered for a country which is not far away from market access or which finds itself in a difficult global market environment.
- **How relevant are the moral hazard considerations associated with partially guaranteed VDBs?**
- Investor moral hazard appears to be of no relevance as long as an investor suffers losses exceeding 50 per cent of his capital in the event of default.
  - Debtor moral hazard does not seem to be particularly relevant either.
  - Even though low growth reduces the debt burden of a VDB, this "benefit" is outweighed by the large political costs of low growth.
- **Could a guarantee result in a burden on public budgets?**
- With a World Bank guarantee a direct burden on national budgets cannot be expected as long as the World Bank continues to apply its prudent risk management and creditworthiness checks.
  - Nevertheless, for countries with a low rating, a World Bank guarantee implies a hidden subsidy since current guarantee fees would not be a sufficient compensation for the default risk.
- **Which type of VDB is the best one?**
- Very short time to maturity (e.g. 3 years): Linkage of coupon and redemption payments to GDP development might be suitable, possibly combined with an option to guarantee redemption not below par.
  - Longer time to maturity (more than 3 – 5 years): Redemption at par. Otherwise the redemption payment could be far above (or below) par. Coupon could be either linked to GDP development (i.e. relative to GDP at date of issuance) or to GDP growth (e.g. quarter-to-quarter change).
- **What are the basic conditions for a successful VDB issue?**
- VDBs should have a simple structure (easy to understand and to price) if they are to be accepted by the capital market.
  - High total volume of issues to guarantee a liquid secondary market (at least 500 million euros or US dollars).
  - A carefully prepared pioneer VDB issue should be launched. If successful, this prototype would facilitate subsequent issue by other countries.
- **What are additional conditions for a successful issue?**
- A favourable macroeconomic situation of the issuer country and the world economy.
  - A stable track record of the issuer country in political and economic terms (could be partially substituted by a public guarantee).
  - The existence of a rating.
  - Subscription of the issuer country to the IMF's Special Data Dissemination Standard.
  - Countries which are not eligible for World Bank credits are definitely not VDB candidates. ■■

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