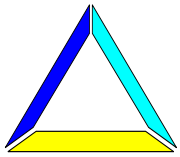
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How should the compensation bonds for Sberbank deposits be indexed?

Executive summary

In our recent policy paper S34 we suggested that the government should compensate former Sberbank depositors by giving them „compensation bonds" with different maturities from 1 to 25 years. To make sure that these bonds do not lose much value during time, they should be indexed.

In this paper we develop four criteria to assess the appropriateness of different indexation schemes. Bond-holders (former depositors) must be protected against losses in the value of the bonds and from being deceived by dishonest intermediaries. The government on the other hand must be protected against unexpected increases in the real budgetary burden and it should be able to predict more or less accurately the expenditure for debt service in a given year. Using these four criteria we assess the appropriateness of three different types of indexation: explicit inflation indexation, implicit inflation indexation and denomination in US dollars. We come to the conclusion that an explicit inflation indexation is the most appropriate way to index compensation bonds.

Content:

1. Introduction
2. Criteria for evaluation of different types of compensation bonds
3. Types of indexation schemes
4. Evaluation of different indexation mechanisms
5. Comparison of indexation schemes and conclusion

1. Introduction

Millions of Ukrainian citizens lost their deposits at the former Soviet state savings bank Sberbank. As we stated in a recent paper[1], the government should compensate Sberbank depositors for reasons of justice, as well as to increase the trust of the population in commercial banks and in government institutions. However, the compensation should be done in a way that does not jeopardize fiscal stability. Consequently, we proposed to cut the amount of debt to depositors and to stretch the compensation payments over 25 years. Furthermore, in order to facilitate the compensation process and to prevent unrealistic compensation pledges before the presidential election next year, we favoured the issuance of „compensation bonds" instead of the mere pledge of the government to repay the debt in the future. But 25 years is a long time; it is necessary to make sure that the compensation bonds do not lose much of their value over time. This requires implementation of some sort of indexation mechanism. In other words, the compensation bonds should be indexed. But how to do it? Which are the possible indexation schemes and which of them is the most appropriate for Ukrainian economic condition? In this paper we present concrete answers to these questions.

In part 2 we develop the relevant criteria to assess the appropriateness of different indexation schemes. In part 3 we present three main types of indexation schemes and in part 4 we assess their appropriateness using the criteria developed before. In part 5 we conclude.

2. Criteria for evaluation of different types of compensation bonds

In order to find the best indexation scheme, we need to single out several criteria and asses different indexation mechanisms with respect to the defined criteria. To do this we briefly describe interests of two groups concerned with compensation bonds.

Depositors - the main group to be satisfied and protected properly.

> **Criteria 1 (C1).** As was noted above, the indexation of compensation bonds is first of all intended to protect the value of bond payments. The amount of money that a depositor actually gets each year is a nominal payment. Because of inflation, next year with the same nominal amount the person will be able to buy less goods than the year before. Therefore, the schedule and amount of payments should be designed so that in real terms, i.e. in terms of quantity of goods purchased each year, payments would be the same.
>
> **Criteria 2 (C2).** Bonds should be designed so as to provide the highest degree of safety to its holder. This means protection from forgery and from being deceived or swindled by dishonest money-makers, as well as protection from occasional mistakes and inaccurate calculation of payment amount. With respect to indexation mechanism this implies that bonds should be as understandable as possible. A depositor should clearly see how much money he will get each time and when the payment will be made.

The government. It is important for the government to provide payments that are realistic compared to budget capacities and, at the same time, to secure budget payments from abrupt changes. The former condition is fulfilled as soon as compensation payments are cut and scheduled according to the recommendations in policy paper S34. The latter depends on the indexation scheme and, thus, require more attention.

> **Criteria 3 (C3).** It is in the interest of the government to avoid increases in real burden on the budget throughout whole compensation period. This basically means that indexation scheme should secure nominal budget payments from substantial increases when inflation is low.
>
> **Criteria 4 (C4).** The total nominal amount of compensation payments paid from the budget in the nearest future should be as certain as possible. Predictability of nominal

[1] See policy paper S34 of the German Advisory Group and the Institute for Economic Research and Policy Consulting.

payments is important factor for execution of budget within a given year as well as for drafting of the following year budget. Knowing how much the government should pay in a particular year for compensation of Sberbank deposits will alleviate compiling timetable for other borrowings.

Summarizing all above, the list of criteria looks as follows:[2]

C1. Protection of compensation payments' value

C2. Protection against dishonest behaviour and computation mistakes

C3. Protection against growing real burden on the budget

C4. Protection of nominal payments predictability

3. Types of indexation schemes

Following reasoning of policy paper S34 the compensation bonds should posses the following basic features.[3]

- Non-interest bearing securities.
- Issued to the bearer.
- Payments are distributed over 25-year period, so that every depositor receives part of compensation each year.

Assume also that bonds are issued this year and first payments are made in the beginning of 2004.

Taking into account these basic characteristics of bonds, we consider three most common types of indexation schemes, namely, explicit inflation indexation, implicit inflation indexation, and foreign currency indexation.

Type 1 Explicit inflation indexation

Explicit indexation means that **real** value of payment is written on a bond. Calculation of *nominal payment* is performed in two steps.

First, the special Compensation Price Index (ComPI) is calculated grounding on monthly CPI reported by the Derzhkomstat. Calculated in such a way ComPI reflects recent cumulative change in consumer prices, i.e. from December 2003 to the date of payment.

Second, on the payment date the real value of a bond is multiplied by the latest value of the Compensation Price Index. The resulting product is *nominal value of payment,* the sum of money actually given to the bond-holder on the payment date.

Example of nominal payments for a hypothetical changes in consumer prices in 2004 and 2005 are presented in Table 1, detailed description of calculation procedure is given in Appendix.

[2] Definitely, there are other important criteria for both parties. Among them is existence of secondary market for compensation bonds. If bonds are freely traded at the market, government has a possibility to buy them back at market price and in this way reduce debt burden, whereas depositors who are not willing or cannot wait 25 years are able to sell bonds and receive money immediately, though at lower price. At present, major players on such markets are commercial banks, and tradability of bonds depends on the suitability of bonds' design and their attractiveness for banks. However, provided credibility of payments is ensured, bank personnel is professional enough to work with any bond type and particular indexation scheme does not affect tradability of bonds. Thus, this criterion is beyond the scope of this paper.

[3] Other characteristics of bonds' design (such as denomination, quantity of bonds of a particular denomination, etc.) depend on the distribution of devalued savings with respect to size and quantity and, thus, could be discussed only after proper information is available.

Table 1. Example of explicit indexation scheme for a bond with real face value UAH 100.

Date	CPI reported by Derzhkomstat, mom	Compensation Price Index	Nominal payment received by a bond holder, UAH	Date	CPI reported by Derzhkomstat, mom	Compensation Price Index	Nominal payment received by a bond-holder, UAH
	1	2	3		1	2	3
Dec-03		1.0000					
Jan-04	101.0	1.0100	100.00	Jan-05	101.1	1.0658	105.42
Feb-04	100.8	1.0181	101.00	Feb-05	100.9	1.0754	106.58
Mar-04	100.6	1.0242	101.81	Mar-05	100.7	1.0829	107.54
Apr-04	100.4	1.0283	102.42	Apr-05	100.5	1.0884	108.29
May-04	100.2	1.0303	102.83	May-05	100.3	1.0916	108.84
Jun-04	100.0	1.0303	103.03	Jun-05	100.1	1.0927	109.16
Jul-04	99.8	1.0283	103.03	Jul-05	99.9	1.0916	109.27
Aug-04	100.1	**1.0293**	102.83	Aug-05	100.0	**1.0916**	109.16
Sep-04	100.3	1.0324	**102.93**	Sep-05	100.2	1.0938	**109.16**
Oct-04	100.5	1.0376	103.24	Oct-05	100.4	1.0982	109.38
Nov-04	100.7	1.0448	103.76	Nov-05	100.6	1.1048	109.82
Dec-04	100.9	1.0542	104.48	Dec-05	100.8	1.1136	110.48

Note: mom – month over month

Since the calculation procedure could be rather complicated for a depositor, people's confidence in compensation bonds indexed in such a way might be strongly undermined. Furthermore, if bonds are freely traded on the secondary market, as they are supposed to be, depositors could be easily deceived by secondary market dealers. To avoid this, **the explicitly indexed bonds must be issued only under the following conditions**:

- The Compensation Price Index is recalculated using Derzhkomstat CPI data by a responsible institution, e.g. by Derzhkomstat itself, Oschadbank headquarter, NBU, Ministry of Finance etc.
- All branches of the Oschadbank are obliged to post each month the following information:
  - the latest value of Compensation Price Index
  - example of nominal payment calculation
  - list of nominal payments for bonds of all denominations

Only under these conditions, each depositor will know exactly how much money he must receive and this will eliminate problems with public confidence and dishonest behaviour of second-market dealers.

Type 2 Implicit inflation indexation

In this case **nominal** value of payments *is determined in advance*, before bonds are issued, and is written on a bond. The calculation of nominal value grounds on government forecast of average consumer prices inflation for the next 25 years. Thus, in contrast to explicit inflation indexation scheme, bond-holders with identical bonds will get the same sum of money regardless of the exact date of payment within the given year.

Example. Suppose that according to government forecast average change in consumer prices over next 25 years will constitute 4%. Inflation is forecasted on yearly basis; therefore, nominal payments in 2004 do not account of price changes yet. That is, if compensation amount of a depositor is UAH 100 as of the end of December 2003, next year this person still gets UAH 100. However, in 2005 he will receive UAH 100*1.04 = UAH 104, in 2006 nominal payment will be UAH 104*1.04 = UAH 108.16, and so on. Table 2 presents distribution of nominal payments over 25 years, this figures will be listed on the bonds.

Table 2. List of nominal payments for bond with implicit inflation indexation.

Year	Nomianl value of payment, UAH	Year	Nomianl value of payment, UAH
2004	100.00	2017	166.51
2005	104.00	2018	173.17
2006	108.16	2019	180.09
2007	112.49	2020	187.30
2008	116.99	2021	194.79
2009	121.67	2022	202.58
2010	126.53	2023	210.68
2011	131.59	2024	219.11
2012	136.86	2025	227.88
2013	142.33	2026	236.99
2014	148.02	2027	246.47
2015	153.95	2028	256.33
2016	160.10		

Type 3 Exchange rate indexation (foreign currency denominated bonds)

This type of bonds are quite wide-spread on the world market. In this case bond payments are fixed in foreign currency. The most prominent candidate for Ukraine is US dollar, which implies that some dollar amount, e.g. USD 20, will be written on the compensation bond. On the payment date this figure is converted in hryvnia using current official UAH/USD exchange rate.

4. Evaluation of different indexation mechanisms

To compare the described indexation schemes with respect to the criteria we use the following ranking mechanism. The degree of adequacy of a particular indexation scheme to a particular criteria is measured by three categories: High, Middle, and Low with corresponding ranks 1, 2, and 3 respectively. For each bond type ranks are summed up over all criteria.

Evaluation of indexation types and reasoning are presented in Tables 3, results of evaluation and total rank are provided in Table 4.

Table 3. Analysis of indexation schemes with respect to defined criteria (rank is given in brackets).

	Depositors		Government	
	Protection of compensation payments value	Protection against dishonest behaviour and computation mistakes	Protection against growing real budget burden	Protection of budget payments predictability
	C1	**C2**	**C3**	**C4**
Type 1. Explicit inflation indexation	High (1) Since nominal payments take into account the latest change in consumer prices.	Middle (2) Even **under condition** that the Compensation Price Index is calculated each month by an independent agency and Oschadbank branches are obliged to post it, there is still space for computation mistakes and disorganization.	High (1) In real terms, budget burden does not exceed planned level throughout the whole 25-year period.	Middle (2) Though nominal payments are not predetermined, their total amount for the next year could be calculated quite accurately due to relatively high quality of short-term official inflation forecast.
Type 2. Implicit inflation indexation	Low (3) There is a possibility of having high inflation periods in the future. Even one year inflation at 20% will bring substantial losses of payments value. In addition, the forecast should be made for the whole period of 25 years. Even if it is precise on average, fluctuations from the mean could be quite significant.	High (1) Since nominal payments are listed on the bonds, no arithmetic operations are needed to calculate them. So, there is no space for computation mistake and it will be more difficult for anybody to deceive the depositor. Furthermore, this type may be more easily acceptable by the public, since people tend to think in nominal terms.	Middle (2) The real burden will tend to be high in years when inflation is underestimated and low when it is overestimated. However, the danger of higher real burden is not so strong as loss of purchasing power (in C1), because very low inflation (deflation) is less likely than high inflation.	High (1) It is known in advance how much money (in nominal terms) is required each year.
Type 3. Dollar denomi-nated	Middle (2) While being related, inflation and depreciation are not the same things, and purchasing power is not secured in times when growth rate of prices exceeds speed of nominal depreciation. In addition, inflation in the United States absorbs purchasing power of dollar over time.	Middle (2) The protection is not high because converting from one currency to another requires an arithmetic operation, plus choice of exchange rate (official, cash bid, cash ask) may serve as a deceiving tool. Furthermore, importance of US dollar for Ukraine in, say, 10 years remains open question.	Middle (2) Despite high potential to real appreciation, the risk that Ukraine will experience of real depreciation cannot be excluded. In such circumstances real value of total payments from the budget will be higher than planned.	Low (3) It is not likely that the NBU will pursue its current exchange rate policy for the next 25 years. Under the floating exchange rate regime, exchange rate is much more volatile than inflation, which means that amount of payments will be very difficult to predict.

Table 4. Summary of criteria adequacy for each type of indexation scheme

	Depositors		Government		Result
	Protection of compensation payments value	Protection against dishonest behaviour and computation mistakes	Protection against growing real budget burden	Protection of budget payments predictability	
	C1	**C2**	**C3**	**C4**	
Type 1 Explicit inflation indexation	High (1)	Middle (2)	High (1)	Middle (2)	**6**
Type 2 Implicit inflation indexation	Low (3)	High (1)	Middle (2)	High (1)	**7**
Type 3 Dollar denomi-nated	Middle (2)	Middle (2)	Middle (2)	Low (3)	**9**

5. Comparison of indexation schemes and conclusion

Let's start comparing the bonds with explicit inflation indexation (type 1) with the dollar-denominated ones (type 3). Explicit indexation is superior to dollar denomination in three criteria (C1, C3 and C4) and equal in the remaining criteria (C2). Thus, explicit indexation is clearly more appropriate than dollar denomination. Consequently, the race for the best indexation scheme is now limited to the types 1 and 2 (explicit and implicit indexation, respectively).

Among two inflation indexation mechanisms, explicit indexation (type 1) beats implicit indexation (type 2) in two criteria (C1 and C3), but is beaten in the remaining two criteria (C2 and C4). Notwithstanding this stalemate situation, we argue that explicit indexation (type 1) is clearly more appropriate than implicit one (type 2). If one considers all four criteria as being of equal importance (simple addition of ranks at the last column of Table 4), explicit indexation scores better than implicit one (6 against 7, respectively). Furthermore, explicit indexation is stronger at the two criteria which we consider to be most important, namely the protection of depositors and the government of strong changes in the real value of the bonds (C1 and C3). Therefore, explicit indexation is the clear winner. The issuance of explicit inflation-indexed compensation bonds will protect bond-holders against large losses in value, without endangering the fiscal stability of Ukraine.

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Kyiv, July 2003

Appendix. Calculation of nominal payments for explicit inflation indexation

1st step. Calculation of the Compensation Price Index (ComPI)

Since changes in consumer prices over period longer than 1 year is not reported by the Derzhkomstat, introduction of special Compensation Price Index, that would account of cumulative change in consumer prices from December 20003 to the payment date, is required. It is worthwhile to note, that this special price index does not entail any additional work of Statistics Committee personnel such as collection of prices. ComPI is simply consumer price index (CPI) already reported by the Derzhkomstat each month. The only difference is that December 2003 is used as a base date. Thus, ComPI can be calculated by anybody who knows monthly CPI dynamics, using the formula:

$$ComPI_t = ComPI_{t-1}*(CPI_t-100)$$

It should be taken into account, that methodology of consumer prices collection as well as formula for consumer price index calculation could be changed and previous values of CPI revised. According to the international experience with inflation indexed bonds, in such cases payments made before the change in methodology are not adjusted, while payments made after the change are calculated using new measure of consumer prices.

2nd step. Calculation of nominal payments

Nominal payment is simply real value of payment corrected for cumulative change in prices:

$$(\text{Nominal value of payment})_t = (\textit{real} \text{ value of payment}) * ComPI_t$$

Example

Suppose that the real value of a single compensation bond equals UAH 100. Under explicit indexation scheme exactly this figure is written on the bond. Assume also that payment is scheduled in September 2004. How much money will this person receive then?

The example of calculation is presented in Table 1. Inflation figures in the first column are in month-over-month format provided by the Derzhkomstat in the beginning of the next month. The Compensation Price Index in column 2 shows change in consumer prices from December 2003 to current month. To calculate the ComPI for a particular month one needs to multiply the previous month value by month-over-month percentage change in CPI:

$$ComPI_{August} = ComPI_{July}*(CPI_{August} - 100)$$

As Table 1 shows, if from December 2003 to August 2004 consumer prices increased by 2.93%. (ComPI = 1.0293), in September 2004 the bond-holder would get:

UAH 100 * 1.0293 = UAH 102.93

If payment is done in September 2005, nominal value is calculated analogously. Assume that consumer prices from December 2003 to August 2005 grew by 9.16% (ComPI in August 2005 is equal to 1.0916), thus in September 2005 the bond-holder will get:

UAH 100 * 1.0916 = UAH 109.16