Financial Aspects of Central Bank Independence and Price Stability

The Case of Turkey

Daniel Gros

Abstract

Turkey presents a fascinating case study on the potential fiscal consequences of price stability against a background characterised by a combination of recent central bank independence, a difficult path towards price stability, a high degree of dollarisation and a central bank balance sheet burdened with items that have little to do with monetary policy. A number of national central banks (NCBs) in Europe faced similar problems prior to joining EMU (and some of the new EU member countries' NCBs also face similar problems now), but in Turkey all these issues combine in a mixture that is unique and may lead to serious problems.

Taking the implications of dollarisation into account in the measurement of seigniorage leads one back to the fundamental issue of how to judge monetary policy in a country where the national central bank controls only the money supply in national currency.

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1.   Introduction

The job of a central bank is to conduct monetary policy. In a market environment this should mean exchanging central bank money against assets of the private sector. Central bank money constitutes a rare commodity for the private sector, which needs it to facilitate transactions and it is used by the financial sector to clear its daily position in the money market. The conduct of monetary policy thus has a direct impact on the balance sheet of both the banking system and the central bank.

In countries where the separation of the central bank from the fiscal accounts of the public sector is weak, monetary policy has also direct implications for fiscal policy, which in turn carries the threat that the aim of reaching price stability will be put in jeopardy by fiscal considerations. Moreover, in a country with a history of unstable money, the private sector usually starts using foreign money even for domestic transactions, which also has important consequences for the way the central bank can conduct its monetary policy.

Central banks are not profit-maximising institutions. Their primary objective almost everywhere by now is to maintain price stability. They do nevertheless care about their balance sheets, in particular their profit and loss account, because avoiding losses is indispensable to preserving independence. Moreover, if a central bank makes losses, other agents, presumably market operators or the government, make corresponding profits. Loss-making operations with the private sector thus imply a subsidy, which contradicts the conduct of monetary policy in an open market economy. Loss-making operations with the government threaten directly central bank independence.

For all these reasons it pays to investigate balance sheets and the resulting profit and loss accounts of central banks. This paper concentrates on the issues that arise in a special case, namely Turkey, but the discussion will be set in the European context, meaning taking into account the experience of countries that aim at joining either the eurozone (e.g. the new EU member countries) or the countries that are candidates for EU membership and thus potential future candidates for eurozone membership as well.

As an aside, one should note that this problem is not confined to the newcomers to the European sphere of central bank independence and price stability. The national central banks (NCBs) that are now part of the Eurosystem had also accumulated large amounts of assets in the past. In EMU, most of these assets are no longer needed and could be dispensed with, but little has been done so far.

Turkey constitutes an interesting case for the study of the implications of price stability for fiscal policy, because this country is well advanced on its way to this goal after a decade of endemic high inflation hovering close to three-digit levels. One concern in this context must be whether the loss of the inflation tax, usually called seigniorage, will make fiscal consolidation more difficult.

Basic economic analysis suggests that high inflation rates should be reflected in high central bank profits (which are then transferred to the government). But whether or not this happens in reality depends on the size and composition of the balance sheet of the central bank. Or, to be more precise, the difference between the actual size of balance sheets and the theoretical balance sheet one could expect from a central bank is concerned exclusively with monetary policy and nothing else.

To establish a benchmark of good (or rather acceptable) practice, it might be useful to start by briefly examining the balance sheet of the Eurosystem and then look at how it relates to that of the component NCBs. This is done in section 2, including a comparison with the balance sheets of two other G-3 central banks (the US and Japan). Section 3 turns to the flows that should result from a central bank balance sheet, namely seigniorage, and shows how different concepts lead to different ways to measure seigniorage. Section 4 applies these concepts to the case of Turkey where high inflation, dollarisation and a peculiar balance sheet structure interacted in a particular way. Section 5 concludes.

2. What is the 'European standard' for central bank balance sheets?

It might be useful to start with a comparative G-3 perspective, i.e. a comparison with the US and Japan. Table 1 lists the standard broad liability items for the Eurosystem, the US Federal Reserve and the Bank of Japan. The first item shows that the eurozone, Japan and the US have a monetary base of approximately the same size (about €430 to €450 billion). The third item shows that the total liabilities of the Eurosystem amount to about €700 billion, more than one and a half times its monetary base. In the case of the Fed, the difference between the monetary base and total liabilities is not so large. Japan's situation is more similar to that of the Eurosystem, following extended 'dual' operations which, according to comments published by the Bank of Japan, were aimed at stabilising market interest rates. The 1997 situation was more similar to that of the Fed.

An index of the degree to which a central bank has only monetary policy operations on its balance sheet can be constructed as the ratio of total liabilities over the monetary base in percentage. A value close to 100 indicates a balance sheet that is determined only by monetary policy operations, i.e. the provision of monetary base. In terms of this indicator, the Eurosystem scores over 170 against around 120 for both the US Federal Reserve and the Japanese central bank.

Table 1. The G-3 balance sheets compared (€ billion)

	Sum of EU-11 NCBs (1997)	**Eurosystem 2002**	**US Federal Reserve**	**Bank of Japan**
Monetary base	429	554	442	405
o/w Banknotes in circulation	335	440	414	381
o/w Deposits of financial institutions	94	114	28	24
Other liabilities and capital accounts	324	281	86	98
Total liabilities and capital accounts	753	835	528	503
Clean balance sheet indicator	175.5	150.7	119.5	124.2

Source: Financial statements of national central banks, 1997 (details may not add to totals because of rounding).

The consolidated data for the Eurosystem hide large differences between NCBs. Table 2 describes the situation for the component NCBs in terms of their degree of capitalisation. The Bundesbank, with 142%, while still far from the US or Japanese values, has one of the lowest (leanest) capitalisation levels. The Banco do Portugal stands out at the other extreme, with total liabilities over three times greater than its monetary base. The explanation for this situation is that when reserve requirements were reduced from about 16% to the current level, the Banco do Portugal did not allow commercial banks to dispose of the deposits they had, but transformed them instead into medium-term liabilities which will mature in 2004. At that time, the balance sheet of the Banco do Portugal will shrink considerably, unless these liabilities are rolled over.

Table 2. Clean balance sheet indicator: Total liabilities (incl. capital accounts)/ monetary base in %

| Germany	France	Italy	Spain	Austria	Belgium	Ireland
144.1	179.2	266.7	150.4	186.2	189.8	188.0
Luxembourg	Netherlands	Portugal	Finland	EU-11	USA	Japan
155.8	178.6	387.6	257.7	180.5	117.4	121.5

Source: Financial statements of national central banks, 1997 and own calculations assuming a minimum reserve ratio of 2%.

Why did EU NCBs accumulate so much capital and other liabilities unrelated to monetary policy? In the 1970s and 1980s, most central banks were not independent. Inflation was high and monetary policy was conducted also through administrative measures, creating distortions for the national banking system. Prior to monetary union, NCBs in a number of member countries had special relations with commercial banks and gave the public sector privileged financing. This was compensated for by large provisions to strengthen their capital base, thereby increasing the size of the central bank's balance sheet, compared to the monetary base.

In the 1990s, the process came to an end, partly because of the liberalisation of the banking system under the Internal Market programme and ultimately because the Maastricht Treaty prohibited central bank financing of the public sector. NCBs have nevertheless kept the assets and liabilities they had accumulated. An image of their past is thus being kept frozen in their balance sheets.

What were the factors behind this diversity of balance sheet structures and the overblown size of some of them? If the above-mentioned conjecture about the genesis of the excessively large balance sheets is correct, there should be a correlation between the latter and central bank independence and inflation. Figure 1 plots the average inflation rate during the pre-Maastricht period (1967-90) against the capitalisation indicator. In countries with higher inflation, NCBs typically had balance sheets in which the monetary base was only a small part of total liabilities and capital accounts. The correlation coefficient between inflation and capitalisation is about 0.7 and statistically significant at the standard confidence levels.[1]

Figure 1. Average inflation and clean balance sheet indicator
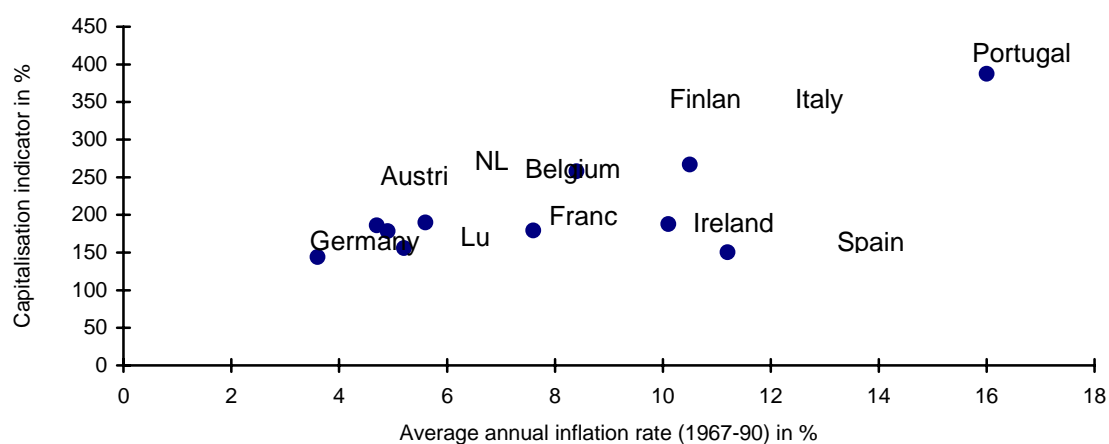
Sources: Annual reports of national central banks, 1997; IFS, 1997; and author's own calculations assuming a minimum reserve ratio of 2%.

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[1] As an aside it is interesting to note that the correlation between capitalisation and central bank independence is also strong and negative (see Bini-Smaghi and Gros, 2000, for details). The authors use the central bank independence indicator developed by Grilli, Masciandaro and Tabellini (1991) and find that the more independence a central banks enjoys, the lower is its (over-)capitalisation. The correlation coefficient is about -0.7 and statistically significant.

The new member countries have a somewhat mixed history in terms of inflation and the organisation of their financial systems. This is reflected in the wide range of values for the (c)lean balance sheet indicator presented in Table 3. The data in panel A refer to one year, 2001. Panel B, below, shows several years' worth of data for Turkey, because in this case the indicator varies considerably from year to year.

Table 3. Clean Balance Sheet Indicator

Panel A. New and prospective member states (total liabilities (incl. capital accounts)/monetary base in %)

Bulgaria	Czech Republic	Estonia	Hungary	Latvia
251.8	146.7	142.1	305.7	120.9
Lithuania	Poland	Romania	Slovakia	Slovenia
136.6	168.7	347.0	148.8	574.4

Source: Balance sheets of national central banks, 2002, and own calculations.

Panel B. Turkey (in %)

	1999	2000	2001	2002	2003
TRL Monetary base	527	534	1061	776	551

Source: Own calculations based on data from the Central Bank of Turkey.

The data for Turkey fit this picture perfectly. The balance sheet of the Central Bank of Turkey (CBT) has fluctuated between 5 and 10 times the size justified by what would be needed to manage its national currency. On this indicator Turkey beats even the EU champion Portugal, which fits with its history of even higher inflation.

NCBs' balance sheet structures in the euro area have not changed with the move to EMU. They reflect the NCBs' past degree of independence and inflation performance. The question is whether the large amounts of assets and liabilities that some central banks still carry on their balance sheets constitute a nuisance in the Eurosystem.

The factors that have led to the current structure are not relevant anymore. The Eurosystem has been granted independence to conduct a monetary policy aimed primarily at maintaining price stability. Monetary financing of the government has been prohibited. Furthermore, monetary policy has to be conducted in line with the principles of an open-market economy with free competition. Finally, central bank transactions have to be fully collateralised. All these constraints make it useless for NCBs to hold a large amount of capital.

Stripping central banks of their tasks as investment managers would allow them to concentrate on their role as guardians of price stability. This can only increase their independence. Otherwise, they would have to be held accountable not only for price stability, but also for their performance as managers of a large portfolio of foreign investments. What holds for the NCBs participating in the Eurosystem should hold *a forteriori* also for central banks from countries that are either candidates for EU or euro area membership. The independence of the central bank could be re-inforced by cleaning up balance sheets. Preparing to join the EU and subsequently the euro represents a good occasion to simplify and streamline NCBs' balance sheets, which in many cases contain items that are only of historical interest.

As this area falls formally under the responsibility of NCBs, it is up to them to act and dispose of parts of their assets and liabilities until the remainder is just equal to the monetary base plus a small capital and an appropriate revaluation reserve.

In summary, restructuring of NCBs' balance sheets would increase transparency and independence of national central banks by reducing possible conflicts of interest and thus allowing them to concentrate

on price stability. There will no direct financial gains or losses from cleaning up balance sheets. But in some cases the management of foreign assets and liabilities constitutes a delicate problem that might be best solved by creating national debt boards (until the country joins the euro).

Turkey is a case in point, and as usual the phenomenon is an order of magnitude larger than elsewhere. At the end of 2002, the CBT held foreign assets worth about 18% of GDP, but at the same time also had foreign liabilities of a similar amount. For an OECD country with a small risk premium on its foreign debt, these contemporaneous holdings of huge assets and liabilities might not matter because the cost of foreign liabilities should be the same as the return on foreign assets. But the case of Turkey is different. A large part of the foreign liabilities are due to IMF and World Bank loans, on which the country does not pay a large risk premium, but this will not be the case for all other liabilities, whose service will cost much more than the return from foreign exchange assets the CBT can expect.

Table 4. Turkish monetary authorities' balance sheet as % of GDP (2002)

Assets		Liabilities	
		Reserve money	7.7
Foreign assets	17.5	of which currency outside DMBs*	2.5
Claims on central government	19.5	Other liabilities to DMBs*	3.5
Other assets		Foreign liabilities	21.7

*DMB = Deposit Money Banks.
Source: International Financial Statistics Yearbook 2003, IMF.

3.   What is seigniorage?

The discussion has so far focused on the stocks (balance sheets), but the flows that derive from these stocks are of even greater importance, in particular the flow revenue the central bank can expect from its monopoly of the issuance of national currency. This revenue is called seigniorage, or inflation tax. There is a large literature on what constitutes seigniorage (for further references see Schobert, 2001). Seigniorage is usually defined as the command over real resources the authorities can obtain by printing money or forcing banks to hold deposits with the central bank. If no interest is paid on the balances the banks are required to hold with the central bank the economic nature of these required reserves is similar to that of currency. The sum of cash and required reserves is called the monetary base. Most modern central banks (including the ECB) that do impose reserve requirements on commercial banks remunerate them at market rates.

Taking into account interest payments on required reserves, total seigniorage, as a proportion of GDP, can then be measured by:

(1) $s_{1t} = [D(C_t) + D(RR_t) - i_{rr,t}RR_t]/GDP_t$

where $D(C_t)$ and $D(RR_t)$ denote the change in currency in circulation and the change in total required reserves held by commercial banks with the central bank, respectively. The variable $i_{rr,t}$ denotes the interest rate paid on these reserves. GDP stands for nominal GDP. This measure of seigniorage has been used often in empirical and policy oriented analyses of the EMS. However, this definition of seigniorage might lead to a situation in which for a given period measured seigniorage is negative because over a given period the monetary base has declined, for example because the reserve requirement coefficients have been changed or because the demand for cash has gone down.

The definition of seigniorage employed in equation (1) measures a flow, namely the goods and services the government can buy by issuing additional fiat money or constraining commercial banks to hold additional deposits with the central bank. A different view of seigniorage emphasises the idea that currency can be regarded as a zero interest government bond. According to this view the revenue from

seigniorage is the savings in interest payments the government obtains because it issues a zero interest rate bond. Taking into account interest payments on required reserves this second definition of seigniorage therefore implies that the revenue from seigniorage is given by:

(2) $s2t = \{itCt + [it - irr,t] [RRt]\}/GDPt$

This expression shows that the imposition of required reserves always increases seigniorage as long as the interest rate on government debt (i.e. bonds), exceeds the interest rate paid on reserves, $i_{rr,t}$. This is likely to be the case most of the time in the euro-area since the required reserves are remunerated at the rate for short term inter-bank deposits, which is usually below the rate governments pay on their public debt. While for most countries this complication is quantitatively not very important, it is for Turkey, where T-bill rates and interbank deposit rates have diverged by as much as 20 percentage points.

The economic meaning of the two definitions of seigniorage can be illustrated by comparing the government to a firm. The first definition would then correspond to the cash flow and the second definition would correspond to the earnings of the firm. It is not clear a priori which definition of seigniorage is more appropriate for an evaluation of the fiscal impact of financial integration in the EC. On the one hand, government revenues and expenditures are usually measured on a basis that is closer to the definition of cash flows and governments might therefore be more interested in the contribution of seigniorage to cash flow. On the other hand, if government revenues and expenditures were evaluated in terms of opportunity costs, the second definition of seigniorage would yield a more accurate measurement of the fiscal importance of seigniorage.

The two definitions are often used in parallel because under 'normal' circumstances they lead to quantitatively similar results. The link between the two can be established via a simpl general money demand function, like:

(3) $Mt = D(Ct) + D(RRt) = m(pt) GDPt$

where $m(.)$ denotes ratio of monetary base to GDP, which is a function of the inflation rate, p_t. It follows that the first concept of seigniorage can be written as a function of $m(.)$ and the sum of inflation and the real growth rate of GDP, denoted by y_t:

(4) $s1t = m(pt)[pt+yt] - (irr,tRRt)/GDPt$

The second definition of seigniorage can be expressed as a function of the same variables if one decomposes the nominal interest rate in its real (r_t) and nominal component (inflation): $i_t = r_t + p_t$:

(5) $s2t = m(pt)[pt+rt] - (irr,tRRt)/GDPt$

The only difference between these two concepts is thus the difference between the real interest rate and the growth rate of real GDP. In general the two should move together in the long run (at least in a closed economy), but this is definitely not the case in the short run. In countries with stable economies the short run difference is, however, also limited as both real interest rates and real growth rates fluctuate between 0 (present) and 3% (longer run average for eurozone, and most eurozone member countries). Turkey is again different as real interest rates have at times exceeded 20% and real growth rates have fluctuated between close to minus 10 and plus 8%.

For the concrete problem at hand the key is that the second concept of seigniorage actually corresponds to the profit a central bank should make, i.e. simply net interest income minus interest expenditures (neglecting other items like personnel, buildings etc. which might eat up a considerable proportion of seigniorage). A central bank whose only activity was to issue base money and invest the proceeds in government (or other) bonds would indeed make profits given by the equivalent formula (2) or (5).

In principle it should be straightforward to determine the profits of central banks, but since the accounting of the Central Bank of Turkey is extraordinarily opaque (like that of most NCBs in Europe; only the US Federal Reserve is much more open) it is in reality very difficult to determine precisely how much the CBT has earned by its management of the Turkish lira.

NCBs are typically required to pay out their accounting profits to the national Treasury. In Turkey the central banks is subject to corporate income tax (formally it is constituted as a private limited liability company) and it then has to pay over to the Treasury a sum that is equal to its (after-tax) profits minus two items: a deduction of around 25% for its reserve fund (ca. 20%) and another one of around 5% for its employees. This latter provision, while without macroeconomic relevance, seems to give the wrong incentives to the staff of the bank: if the bank achieves price stability they risk seeing their bonuses reduced.[2] Fortunately, it appears that the remuneration of the policy-making body of the CBT does not depend in this direct way from the profits of the bank. Through a combination of corporate income tax and other elements it appears that the government obtains about one-half of the profits of the CBT.

But in reality central banks have a lot of leeway in the way they determine their profits and have always tended to hide them as much as possible. The most important instrument used by many NCBs to hide their true profits (seldom losses) is the accumulation of reserve funds and unrealised losses and gains and losses on foreign assets (gold and foreign exchange reserves). This is also the one mean reason for the relatively 'long' balance sheet of the ECB.

4. Actual seigniorage revenues and central bank profits: The case of Turkey

In principle one would expect seigniorage revenues to be substantial given the very high inflation rates prevalent until recently. However, calculating seigniorage revenues is not straightforward in the case of Turkey. A first question that arises when one considers the concrete case of Turkey is the definition of the monetary base. The first standard element, cash in circulation, poses no problem, this refers to the currency issued by the CBT, i.e. Turkish lira. However, the second part of the monetary base, reserves of banks with the central bank, is usually measured (e.g. in the statistics of the International Monetary Fund) by including foreign currency deposits. But it should be apparent that if a country forces its financial institutions to hold non-remunerated deposits in a foreign currency, it is imposing a tax on the domestic banking system, but this cannot be called seigniorage. The limitation to the currency issued nationally must thus apply to the entire monetary base if one wants to measure seigniorage. The importance of this consideration for a highly dollarised economy like Turkey can be seen from the fact that TRL liabilities of the CBT towards domestic financial institutions are now only about one-third of its corresponding foreign currency liabilities.

Table 5. Liabilities of the CBT towards domestic financial institutions (required plus free reserves) (% of GDP)

	1999	2000	2001	2002	2003
In TRL	1.9	1.6	1.4	1.0	1.2
In foreign exchange	3.9	3.4	5.8	3.9	2.8

Source: CBT, annual reports.

Seigniorage has thus to be calculated for Turkey using only the TRL part of the monetary base. This applies to both concepts of seigniorage. The cash flow concept just requires information on the annual changes in currency in circulation and the TRL part of the money base. The former was taken from IMF statistics, the latter was available only for the last few years from the CBT website. The same source was used for information on interest rates paid on required reserves. Over the last years interest rates have fluctuated widely in Turkey, with at times wide differences between interest rates on T-bills

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[2] The justification given is that this bonus (limited to two months salary) should help to attract qualified staff.

and interbank rates. The latter were at times 20% higher because of the acute banking crisis. The CBT is now forbidden to extend credit to the government. Hence one might argue that the return the CBT should earn on its assets is the inter-bank rate. However, this rate incorporated a high risk premium to the banking crisis. Moreover, claims on the central government still make up about half of the total assets of the CBT (amounting to close to 20% of GDP in 2002). It seems thus preferable to use the T-bill rate as an approximation of the risk-free rate the CBT could earn on its assets. The results produced on the basis of these data and assumptions are presented in Table 6.

Table 6. Seigniorage in Turkey

In % of GDP	1999	2000	2001	2002	2003
Cash flow from cash	1.1	1.1	0.7	0.9	0.8
Cash flow from CBT TRL liabilities*		0.8	0.4	0.6	
Total cash flow seigniorage		1.9	1.1	1.5	
Interest gains from cash	1.8	0.6	2.1	1.5	0.9
Interest gains from CBT TRL liabilities*	NA	0.5	0.9	0.6	
Total opportunity cost seigniorage		1.1	2.9	2.1	

*Adjusted for interest paid on reserves.

Source: Own calculation based on CBT data.

Even a cursory inspection of this table shows that with the high inflation rates from which Turkey has suffered so much over the last decade the state should have been able to profit from its monopoly of the issuance of money; earning around 2% of GDP on average over the last three years. The main reason for this relatively low yield from the inflation tax is, of course, that in a highly inflationary environment economic agents reduce the amount of domestic cash they hold to a minimum. The same applies to bank deposits, with the result that the base for the inflation tax shrank to a minimum. The average for the cash flow concept of seigniorage has been almost a third lower than the opportunity cost concept because of the high real interest rates prevailing during this period. A part of the seigniorage gains over the last years (perhaps as much as a third) were thus extra-ordinary, as can be seen by a simple calculation: cash in circulation plus the TRL liabilities of the CBT amount to about 3.5-4.5% of GDP. This implies that a real interest rate of 12-20% will ybring an additional gain of about 0.42-0.9% of GDP.

How do these theoretical gains relate to the actual profits of the CBT?

Table 7. Seigniorage compared to profits of CBT

In % of GDP	1999	2000	2001	2002	2003
Profits declared by CBT as % of GDP	**0.65**	**0.80**	**3.79**	**0.02**	**-0.43**
as % of government revenues	**2.56**	**2.80**	**12.43**	**0.08**	**-1.83**
Pro memoria					
Interest gains from cash	1.8	0.6	2.1	1.5	0.9
Interest gains from CBT TRL liabilities*	NA	0.5	0.9	0.6	
Total seigniorage opportunity cost		1.1	2.9	2.1	

*Adjusted for interest paid on reserves.

Source: Own calculation based on CBT data.

Table 7 shows that the profits of the CBT have been extraordinarily variable, falling from almost 4% of GDP in 2001 to close to zero in 2002 and then turning into a loss in 2003. This might be due to the fact that the law on the central bank was amended in the year 2000, giving it for the first time full independence and abolishing the privileged access of the Treasury (see Annex 1). Profit and loss

accounts prior to 2000 can thus not be used to measure the seigniorage effectively transferred to the budget. This transfer could have taken place via zero or low interest 'advances' to the Treasury. Therefore, the opportunity cost concept represents a much better guide to the potential loss of revenue from price stability. For a comparison with the recent experience of some of the new member countries and some Southern EU members prior to EMU, see Annex 2.

5. Concluding considerations

Achieving price stability has fiscal implications. This note has illustrated the order of magnitude of the issue for the particular case of Turkey. Estimates of the revenue from seigniorage show that the central bank (and thus ultimately the Treasury) should have benefited from the high inflation and high (real and nominal) interest rate environment, earning until recently approximately as much as 2% of GDP. Most of this will disappear once price stability has been established on a credible basis so that both real and nominal interest rates can fall below double digit levels.

At that point a danger might arise for the independence of the CBT because it has a large amount of foreign assets and liabilities on its accounts. Given the large country risk premium for Turkey on international financial markets, it is likely that the CBT has to pay a higher interest rate on its liabilities than it receives on its foreign currency assets (which it also has to keep in a liquid form so that they can be readily mobilised). With foreign assets and liabilities on the balance sheet of the CBT amounting to about 20% of GDP, an interest differential of 2-3 percentage points could easily lead to losses worth 0.4-0.6% of GDP, i.e. more than the remaining seigniorage revenues the CBT could expect under price stability. In the year 2003, the CBT already recorded a small loss. This is not by itself decisive. But if it were to run sustained heavy losses because of its overblown balance sheet, its independence might in the end be put in danger.

Another peculiar aspect of the CBT's balance sheet is the fact that a large part of its foreign exchange reserves (close to one-half in 2002-03) came from its own 'offshore' operations. For some years a German branch of the CBT has collected deposits in euro (in the past DM) from Turkish citizens living in Germany which were then transferred via an exclusive agreement with one of the large German banks to its own foreign exchange reserves. The total thereby collected amounted, according to press reports, to around €15 billion. The CBT was also reported to have paid consistently above-market interest rates on these deposits. This is another example of an activity that has nothing to do with guaranteeing price stability and should thus be discontinued as soon as possible.

Price stability leads to a loss of the inflation tax, but it might also bring considerable benefits. It is well known that when inflation is high the real value of tax revenues is often eroded because any tax that is collected with some delay loses some of its value. This well-known 'Oliviera-Tanzi effect' will operate in Turkey as well. However, there is an additional effect that should be operating in Turkey once price stability becomes so secure that it no longer pays for economic agents to use foreign currencies. One aspect of this is the 'dollarisation' of bank deposits, which can be easily measured. It is now around 40% of total banking deposits, depending of course on the exchange rate. It is impossible to provide an equivalent measure for another variable that is more important, namely foreign currency in circulation, but some estimates exist. For example, Faruk (2003) reports that the US Federal Reserve had shipped (by 2002) around $10 billion to Turkey. This is more than the total cash in circulation in TRL, which amounts to about $4.5 billion. In Turkey the euro is as widely used as the USD, and it is thus likely that an equivalent amount of euro is also in circulation. This would imply that the total (foreign) currency in circulation in Turkey could be around 18-20 billion euros or dollars, equivalent to close to 10% of GDP. With an interest rate on Turkish foreign debt of around 7-8%, this would imply that the cost to the Turkish economy of this high degree of dollarisation/euroisation must be close to 1% of GDP. It is likely that once price stability has been really established, currency holdings will change to a pattern like that of Bulgaria where the (domestic) cash-to-GDP ratio is now close to 8% of GDP. This implies that achieving price stability could save the Turkish economy foreign debt service equivalent to around 0.5-0.8% of GDP in flow terms (8-10% of GDP in stock or present value terms).

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Annex 1. Excerpt from the Law of the CBT

Article 56- (As amended by Law No. 4651 of April 25, 2001)

The Bank shall not, grant advance and extend credit to the Treasury and to public establishments and institutions, and shall not purchase debt instruments issued by the Treasury and public establishments and institutions in the primary market.

The Bank shall not extend credits and grant advances except for the operations authorized by this Law, and the credit to be extended and the advance to be granted shall not be unsecured or without cover, and in any manner whatsoever the Bank shall not, be a guarantor or provide security other than its own direct transactions.

PART SEVEN
ACCOUNTS AND BALANCE SHEET OF THE BANK,
BULLETIN, EXCEPTIONS, EXEMPTIONS AND MISCELLANEOUS PROVISIONS

CHAPTER I

Provisions and Special Reserves

Article 59- Provisions, in the amounts deemed appropriate by the Board, may be set aside from the gross annual profit of the Bank in order to meet contingent risks which may occur in the following years due to the operations exclusive to the Bank.

Banknotes whose statute of limitation have expired as well as the differences arising from replacement in accordance with paragraph (b) of Article 37 shall be included in special reserves.

Allocation of Profit

Article 60- The annual net profit of the Bank shall be allocated in the following order:

ca) 20 percent to the reserve fund;

b) 6 percent of the nominal value of its share capital to the shareholders as the first dividend;

c) a maximum of 5 percent of the remaining amount to the Bank personnel in an amount not to exceed the sum of two months' of their salaries; and 10 percent to the extraordinary reserve fund; after deducting the above-stated percentages;

d) a second dividend to the shareholders in the ratio of a maximum of 6 percent of the nominal value of its share capital by a decision of the General Assembly.

The balance shall be transferred to the Treasury after this allocation.

Revaluation Differences

Article 61- (As amended by Law No. 4651 of April 25, 2001)

The unrealized valuation gains and losses, arising from the revaluation of gold and foreign exchange due to a change in the value of the Turkish currency, shall be monitored in a temporary account. In the event that these valuation gains and losses are realized, the realized amounts shall be transferred to the income statement, and then shall be subject to distribution from this account.

Annex 2. The potential loss of seigniorage from price stability

Until some years ago many estimates of the potential inflation tax in CEECs arrived at figures of about 2-3% of GDP. This was based on simple arithmetic: a cash-to-GDP ratio of between 5 and 10% combined with rates of growth of nominal GDP of 20 up to 30% (allowing for 5% real growth and inflation rate of between 15 and 25%). This set of figures has not been far from the experience in a number of CEECs until the mid-1990s (see Hochreiter et al., 1996). However, most of them have reduced inflation much below the figures mentioned above. They have done so because they realise the overall benefits from price stability and because inflation has other, less visible, negative effects of public sector revenues. Measured seigniorage is thus never a good guide to the impact of inflation on public sector revenues (the so-called Olivera-Tanzi effect). However, since superficial concepts of seigniorage are easy to calculate, this issue has attracted a lot of attention.

It appears, moreover, that during the early years of the 1990s, countries like Poland and the Czech Republic have actually had very little seigniorage income at all because their central banks had to offset interest income against the losses on huge sterilisation operations. A more systematic investigation of this would require a closer look at the profit and loss accounts of all central banks, which cannot be done for all candidates.[3] However, Schobert (2001) provides a careful analysis of the three largest candidates (CR, H and PL). She finds that seigniorage amounted over the last years to actually only about 0.2 to 0.7% of GDP, much less than for the 'Club Med countries' during a comparable period, where it amounted to between 1 and 2% of GDP (not to speak of Germany, where it is 0.6% of GDP). Table A1 below shows the results:

Table A1. Seigniorage as % of GDP

	Average (1997-99)		Average (1986-9)
Czech Republic	0.7	Germany	0.6
Hungary	0.5	Greece	2.2
Poland	0.2	Italy	0.9
		Portugal	2.0
		Spain	1.1

Sources: Gros & Thygesen (1998) and Schobert (2001).

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[3] Central bank accounting for profits and losses is notoriously opaque even in the EU; see chapter 3 of Bini-Smaghi & Gros (2000).

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