



Seigniorage and Public Deficit: A Test of Comparison between Turkey and Tunisia

Burak Gürbüz

İktisat Bölümü, Galatasaray University,
Ciragan cad., 36, Ortakoy, İstanbul 34357, Turkey
Tel: 90-536-735-5665 E-mail: bgurbuz@gsu.edu.tr

Zehra Yeşim Gürbüz

Researcher, İktisat Bölümü, Galatasaray University
Ciragan cad., 36, Ortakoy, İstanbul 34357, Turkey
Tel: 90-212-227-4480 E-mail: ygurbuz@gsu.edu.tr

Héla Miniaoui

Post-Doctorant, CEMAFI, Nice Sophia-Antipolis University
Avenue Doyen Louis Trotabas, Nice 06050 Cedex 1, France
Tel: 33-6-3174-1197 E-mail: Hela.MINIAOUI@unice.fr

Mounir Smida

College of Law, Economics and Political Science, Sousse University
Cité Erriadh, Sousse 4023, Tunisia
Tel: 216-73-232-666 E-mail: Mounir.Smida@fdseps.rnu.tn

Abstract

Usually regarded as a financial advantage enjoyed by the issuers of the currency, seigniorage is the difference between the nominal value of the currency sign and the cost of its production and distribution. Historically, it took the form of the deterioration of the intrinsic value of coinage from its official value. Sometimes exceptional, revenues from this operation allow the government to finance its spending without raising new taxes. In modern economies, in the absence of deep financial markets, the state has recourse to money creation to finance its deficit. In this regard, the article proposes to evaluate the experience of two countries that have negotiated differently the process of financial liberalization: Turkey and Tunisia.

Keywords: Seigniorage, Public deficit, Central bank, Turkey, Tunisia

1. Introduction

Cagan (1956), Bailey (1956), Friedman (1971), Phelps (1973) and Sargent & Wallace (1981) analyze seigniorage as a source of income to the Central Bank. In this respect, economic theory distinguishes between two approaches. The first is called monetarist. According to theory, an increase in the money thus inflation (monetary inflation) will result in a readjustment of cash. A variation on the rise in inflation increases the nominal interest rates and reduces real money balances. The demand for money increases to restore demand to its original state. This readjustment of cash has the effect an increase in hoarding and reduced consumption.

Instead of borrowing, the government will create its own currency to finance its purchases. From this point of view, active seigniorage was considered a tax on real cash. To increase the tax authorities are obliged to maintain the

acceleration of money supply. Developed by Phelps (1973), the second approach or the opportunity cost of money, defines the seigniorage as the nominal interest rate multiplied by the real money balances. The income obtained by the government is then equivalent to the loss of the interest rate of the private sector.

Early work examined the inflationary financing from the viewpoint of the cost of welfare in relation to alternative means of financing the deficit. Olivera (1967) suggests that inflation-induced seigniorage may lower real income tax, Aghevli (1977) made a cost benefit analysis and showed that in developing countries, development programs can be financed by the inflation tax because of the inefficiency of the tax system. Tanzi (1977, 1978) analyzes the thesis of Olivera (1967) and supports it, hence the effect of Olivera-Tanzi. De Haan & Zelhorst & Roukens (1993) implement different approaches that attempt to analyze the tax inflationary theory of maximization of government revenue, optimal taxation and fiscal dominance hypothesis.

Finally, empirical work as those of Sargent (1982), Dornbush & Fischer (1986), Von Wijnbergen (1989), Buiters (1990) and Easterly and Schmidt-Hebel (1996) try to show a common approach among economists: inflation is often caused by the need of increasing the seigniorage of the government to finance the high public deficit. In the light of economic theory, this article proposes to analyze seigniorage in Turkey and Tunisia. Given the different features of the two economies, and by concerns of rigor, the analysis is limited to the thesis of Cagan. In the first case, the study covers the period ranging from financial liberalization. In the second case, the study began in 1980, it compares the post-deregulation phase with the phase of financial liberalization. The paper is organized as follows: The second section deals with fiscal policies in both countries in light of adopted economic reforms. The third section examines the use of seigniorage as a complementary recourse to finance the budget deficit.

2. A money creation depending on economic shocks

For several years, Turkish economy was characterized by high inflation rates. This erosion in the relative price of the currency was largely explained by the financing of the deficit by money creation (Akçay and al., 1996), Metin, 1998 and Günaydin, 2004). In practice, this deficit was due to both budgetary activities as off-budget activities. Extrabudgetary funds are the financing of public investment such as defense, security or the costs that were caused by unforeseen events such as the earthquake of 1999 or those caused by the economic crises of 2000-2001. (Note 1) On the other hand, the payment of interest component in the consolidated budget has increased considerably since the early 1990s.

This increased public debt translates into higher interest rates on the money market and increased prices for goods and services and creates a favorable climate for seigniorage. The analysis of the deficit since 1980 reflects a change in its structure and increased its percentage share of Gross National Product (GNP).

2.1 Turkey, new fiscal policy and deficit

Since 1980, the Turkish economy has undergone profound changes. Under the influence of political stand by International Monetary Fund (IMF) the country changed course when leaving the policy of industrialization by import substitution. In accordance with the structural budget is usually applied in these circumstances, the government has seen its economic role significantly reduced. Already in 1983, the structure of the deficit has changed. Compared to the situation that prevailed before 1980 and which was characterized by inadequate funding of public institutions, this deficit is explained rather by the relative importance of these expenses.

To reduce the government's role in the activity and give a boost to the private sector, the authorities have taken two major decisions:

- First, the share of investment in public expenditure of the consolidated budget has decreased considerably,
- Second, the value of direct taxes has declined in favor of indirect taxes in government revenue. This was followed by an unexpected rise in public deficits as specified in Figure 1.

This surge in decades in 1980 and 1990 is explained by:

- The Budget Act of 1985 which provided for the debt of the government, not as an economic tool used in case of need, but as a structural source of budgetary financing.
- The convertibility of the Turkish lira and the liberalization of capital movements in 1989.

In 1985, this new law gave the Treasury the possibility of borrowing up to 200% of its deficit, ie the difference between government expenditure and revenues. Under these regulations, the Treasury is increasingly using debt as a funding source. Expressed in real terms, interest rates increased from -2.7% in 1985 to 17.9 % 1986 and 14.6% in 1987.

Thus, the monetization of the debt it has resulted in the increased share of debt service in public spending, she reached up to 51% in 2001. In return, the share of public investment (1980 and 1985), and then the personnel costs (wages paid) were successfully managed (1992).

On the whole and since 1998, the weight of public sector experienced a variation on the rise. It is mainly due to the debt at interest rates much higher, the losses by public banks and the efforts undertaken by the authorities to improve the financial structure of these institutions (see Figure 2).

As that debt has become a source of funding for the State, the share of interest payments has become increasingly important in the GNP and expenditure. It is only the application of an anti-inflationary policy after 1999 to acquire a primary surplus (budget excluding interest) that the share of deficit in the Gross Domestic Product (GDP) began to decline.

However, the economic crises of 2000 and 2001 are again increasing the public deficit in GDP. The choice of a policy of targeting inflation implied reversed that trend.

Some authors (Kepenek & Yentürk, 2000, Bulut, 2002) cite two reasons for the increase in public expenditure after 1986: firstly, those related to compensation for economic losses in the public sector who have seen a decrease in their power purchase following the military intervention of 12 September 1980, secondly, the high recorded imbalance between revenues and spending and consequent changes in interest rates. Günaydin (2004) insists on the factor of internal debt and the change in fiscal policy from 1986 that encouraged the financing of the deficit by domestic debt. Finally, Sakal (2002) argues that political uncertainty is the main cause of the increase in the deficit.

Indeed, this uncertainty has had a negative effect on economic policies, investments, costs and competitiveness. It was exacerbated by populist politics.

2.2 Tunisia, a monetary deficit maintained within the target

Since the introduction of the structural adjustment program negotiated with the International Monetary Fund in 1986, the Tunisian authorities have managed to achieve three main objectives:

- Better control of inflation in the double effect of monitoring the evolution of money supply and the management of the main prices which compose the general price index. (Note 2)
- A restructuring of the financial system. It is characterized by the consolidation of the banking system and privatization of public banks, which caused a new wave of internationalization of capital of these institutions.
- A revision of the strategy for public debt management to reduce the vulnerability of the country vis-à-vis external shocks.

Regarding the budget, the authorities' objective is to raise the funds necessary to finance investment programs. Now, the new strategy for managing the public debt should help to stabilize the economy and consolidate public finances. Briefly, the authorities have set the following objectives:

- Replace international debt by domestic funds,
- Promote the influx of foreign capital to relay the State,
- Convert foreign debt into investments and reduce short term debt.

In general, the evolution of deficit financing reveals two major developments: a decrease in foreign debt in total credit and an increase in the share of Treasury bonds in the medium and long term compared with short term securities.

In accordance with the mission statements of the IMF, fiscal policy in Tunisia has been described as prudent. (Note 3) The deficit was kept within the target of 3% and in spite of the subsidies granted by the state (2.5% of GDP in 2007). Notwithstanding the positive change in tax revenues have increased steadily in nominal terms since 2000, non-tax revenues including proceeds from privatization have further reduced the ratio of public debt, which rose to 50.9 % in 2007 against 58.3% in 2005 and 59.4% in 2004 (see Table 1). (Note 4)

The restructuring of public debt reflects the will of the State to reduce its external commitments. The sharp decrease in this ratio reflects the prepayment of certain external loans in 2006 and 2007 (770 million dinars) whose interest rates were considered high. The fact remains that these funding sources are nearly two-thirds of the outstanding public debt. In order to have more control over the risks of exchange and other variants of Treasury bills were issued. (Note 5)

The analysis of the evolution of the budget deficit since 1980 to distinguish Figure 3 in two main phases: an initial period of high variation and a second period of quasi-stabilization.

- Until 1991: This period has two phases. Decreasing the first phase which is characterized by deficit/GDP ratios relatively high in 1986 (5.3%) and 1991 (5.9%).

The deterioration of this ratio at the end of the period is mainly due to the negative effects of the drought of 1988-1989 and the negative impact of the crisis in the Gulf.

- From 1992: In response to the previous phase during which the ratio has reached an annual average of 3.8%, this second period characterized by the oscillation of the variable around the target of 3% with rates well above the average in 1995 and 1997 (4.5% in both cases).

During the last phase, the control of this ratio is explained mainly by:

- Improved revenue mobilization,
- Revenues from privatization and
- From low interest rates on both internal and external markets
- A restrictive fiscal policy that concentrates on the current expenditure at the expense of capital expenditure.

2.2.1 Own resources of the Government

During the period 2001-2006, the resources of the government (tax revenues and non-tax revenues) increased at an average rate of 7.5% against 3.3% for total debt.

This performance was mainly due to the considerable variation in non-tax revenues that have seen an average increase of 14.8% against 7% for tax revenue. It allowed the state to contain the acceleration of its debt (which grew at the rate of negative 3.3% between 2000 and 2006). The overruns in previous years are explained by the effort by the administration to assist certain public offices to clean their debts to the banking system. Indeed, since the date of 1996, the Central Bank has purchased the receivables guaranteed by the State Offices of Cereals and Oil to the National Bank for Agriculture. In 2006, those stocks totaled 161.4 million dinars. (Note 6)

2.2.2 The debt of the government

The above table confirms the relative decline in foreign borrowing resources from the state budget. On the whole, external liabilities are dependent on the parity of the currency. The shift of risk Dinar actually worsen the public debt ratio was reduced to 54% in 2006 against 58.3% a year earlier.

In conclusion, the good performance of non-tax revenue and the control of expenditure have reduced the budget deficit. Restrictive fiscal policy implemented during the period consisted mainly focus on current expenditure at the expense of capital expenditure, ie, direct investment and government's expenditure of financial support in the form of grants and investments. 12% of GDP in 1986, capital expenditure fell to less than 7% in 1992 to be followed at an average of 7.5% since 2000. As stated above, the restructuring of the public enterprise sector has also to cope with increased expenditure on salaries and debt retirement.

Given the current budget balances could be subject to pressures that are related mainly to the following factors:

- The behavior of taxation

During the 2000s, tax revenues accounted for 71% of total budget revenue as against 75% during the period 1986-2002. This decrease reflects the decrease in the progression of this variable. It has changed at an average annual rate of around 7% from the year 2000 as against 9% in the previous period (see Figure 4).

- The lowering of tariffs

Following the dismantling of tariffs in relation to the entry into force of the Association Agreement with the European Union, some analysts argue that this reform has raised a problem in terms of resource mobilization. In 1990, these duties accounted for 37% of fiscal resources. They fell by 8% of GDP in 1990 to 3% in 2000. (Note 7) In 2006, these resources have decreased by 16 million dinars compared to the previous year and represent more than 490 million dinars (1.2% as a percentage of GDP) but reached 514 million dinars in 2007. (Note 8) Notice however that this year represents the last year in the process of implementing the free trade area with the European Union.

- The non-tax revenue

They are characterized mainly by lower income from raw materials and products from the privatization of public enterprises. At current prices of energy, the decline in oil revenues is partially offset by fees levied on consumption of fuels.

In short, the necessary increase of the resources of the government requires the improvement of tax collection itself dependent on increased revenues (direct taxes) and the growth of domestic demand (indirect taxes). On the other hand, regarding international debt, the authorities should avoid volatile source of foreign currency exchange risk in the portfolio of the debt. (Note 9)

3. Seigniorage, a solution for financing budget deficit

It is generally accepted that the main method of financing the budget deficit is debt (internal or external). The creation of the currency in favor of the government is sometimes seen as an alternative modality. Excessive use of the authorities to this technique could endanger the major macroeconomic balances.

The purpose of this paragraph is to review the models for calculating seigniorage and propose an application in the cases of Turkey and Tunisia.

3.1 Calculation of seigniorage

The economic literature identifies two main approaches to measuring seigniorage. The first approach is known as standard and the second is called "inflation tax".

The standard approach differs in two variants: the monetarist approach which measures seigniorage as income received by the government following the increase in the monetary base (seigniorage = $\Delta M_t = M_t - M_{t-1}$ where M is the stock of monetary base) and the approach of "opportunity cost" or even the approach to public finance which measures seigniorage as the increasing rate of the real stock of currency (seigniorage = $i_t \times M_{t-1}$ where i_t is the nominal interest rate). The second approach involves a different concept of seigniorage, "inflation tax". In this case the seigniorage is to lower the real value of the stock of monetary base due to inflation. Seigniorage total is equal to the sum of the inflation tax which is called active seigniorage and passive seigniorage. The latter is calculated from the increase in real value of monetary base.

As for the base itself, some authors distinguish monetary base itself and adjusted monetary base (Anand and Van Wijnbergen, 1989). Following the deterioration of cash caused by the actual inflation, the government does not receive the entire income from seigniorage. Indeed, not only public sector avails of the currency issued by the Central Bank but also commercial banks and private institutions. An increase in the monetary base causes a loss in value of deposits of commercial banks. This loss is offset by demand for new refinancing. A share of seigniorage is offered to private banks in the form of credits. For this reason, the authors propose a new method of calculating the base called adjusted monetary base. It is calculated as the difference between the monetary base and credits available to commercial banks and private sector institutions.

To determine the amount of seigniorage, it is useful to calculate the two forms of monetary base: the actual and adjusted base. Monetary base is the sum of currency and bank reserves at the Central Bank, according to the following formula:

$$H = C + R$$

Where:

H = Monetary base

C = Currency in circulation

R = Total reserves held by commercial banks.

Adjusted monetary base is calculated as the difference between monetary base and credit to both commercial banks and other private sector institutions:

$$H^* = H - (DCcmL + DCpvt)$$

Where:

H* = Adjusted monetary base,

DCcmL = Loans granted to private commercial banks,

DCpvt = Loans granted to other private institutions.

To calculate the total seigniorage, we need to quantify active seigniorage and passive seigniorage (sum of these two forms of seigniorage).

Active seigniorage rather acts as an inflationary tax. When the Central Bank increases the money supply, this means that the state and the private sector benefit both new cash without paying interest. This concept was developed by Cagan (1956) and Bailey (1956) under the monetarist approach.

One can say that this is a measure of actual cash. Following a rise in inflation, the nominal interest rate also increases. To maintain their purchasing power, economic agents adjust to increase their cash nominal. They hoard more and consume less.

In these circumstances, the state will create its own currency to finance consumption rather than debt. From this point of view, active seigniorage can be considered as a tax on real cash. It can be calculated according to this formula:

$$IT_t = (\Pi * H_{t-1}) / Y_t$$

Where:

IT_t = Active seigniorage

Π = Inflation rate (calculated as the change in the GDP deflator)

H_{t-1} = Monetary base at t-1

Y_t = Current GDP.

Passive seigniorage is equal to the variation of the actual value of the monetary base or, to increase the demand for money. It is measured as follows:

$$S_t = H_t - (1+\Pi) H_{t-1}$$

Where S_t is passive seigniorage.

To calculate the seigniorage we used quarterly data over the period 1987-2004 for Turkey. All of the series are obtained from the Central Bank of the Republic of Turkey. Inflation is calculated by the change in the GDP deflator. For Tunisia, annual data over the period 1981-2006 is obtained from the Central Bank of Tunisia. Inflation is calculated by the change in the CPI.

3.2 Who benefits from seigniorage?

3.2.1 The case of Turkey

In the case of Turkey, the revenue from seigniorage was calculated for the period 1987 - early 2004. It corresponds to the period from the beginning of the financial liberalization until the early years of the adoption of the policy of inflation targeting (see Figure 6 and Table 4) .

Two phases (1988-1997 and 1998-2003) and a sub-phase (2001-2003) were included in the analysis. Indeed, two events have influenced deficits and seigniorage as a means of financing the state.

- The first event took place in the first quarter of 1998. To this date, the Central Bank has stopped the advance of short-term Treasury and other forms of financing enjoyed by the public sector (see Figure 5). Controlling inflation is considered since, as a priority. This priority has not changed during the economic crises of 1998 and 2000-2001.

- The second event took place in April 2001: Following the new reforms, the Central Bank of Turkey has acquired its independence. To calculate the seigniorage are used statistics from the Bank of Turkey. The data are quarterly data.

Overall, the seigniorage revenues have fallen considerably with the advent of independence of the Central Bank. In short, taking into account the steps mentioned reveals a significant decline in the seigniorage in GNP since 1988. To achieve this result, policies to fight against inflation conducted since 1998 played an important role. From 1997, the first law in 1997 prohibited the Central Bank to finance the Treasury; a second law (2001) authorized the Central Bank to decide on the conduct of monetary policy independently of government policies. The fight against inflation has lowered considerably the share of seigniorage in GNP to 0.5% in 2003. A more detailed analysis of these data shows that the state has benefited from advances in the short term until 1997. It is a form of seigniorage as long as the government was given and to repay principal and interest. These advances have decreased before stopping completely after 1999. Concerning the structure of funding arrangements for the public deficit, the statistics show that external debt was relatively high during the 1990s. To contain it, the government has increasingly resorted to domestic debt. Combined with the new rules of exchange (convertibility of the Turkish lira), the permanent debt contributed to the rising interest rates and inflation. The contreperformance is managed by the transfer of capital from short-term response to the significant variation in the money. The overvaluation of the Turkish lira increases the trade deficit and undermines the price competitiveness of export products.

Table 5 reflects the change in the structure of financing the public deficit from the date of 1987. The largest is for domestic funding sources, they are closely followed by income from seigniorage. From 2002, the latter method loses considerably in importance.

Until 1997, the Central Bank was financing the Treasury, by advances in the short term, which is a type of seigniorage because the state does not repay the loan and it is also exempt from interest payments. From that date, the Central Bank began to finance less the Treasury to finally cease funding after 1999.

With the convertibility of the Turkish lira, the arrival of short-term capital contributes to the rise in nominal interest rates and inflation by increasing the money supply. The overvaluation of the Turkish lira increases the trade deficit while affecting the price competitiveness of exports.

3.2.2 The case of Tunisia

Channels of financing the budget deficit are limited to three: taxes, debt and seigniorage. In some cases, the financial needs of the state are met by the use of money creation. This type of inflationary financing was often used during periods of instability, ie, when the regular channels of funding are disrupted. This excessive use of «*la planche à billet*» is often questioned. Indeed, economists fear the following sequence: repeated deficits - debt unsustainable - the monetization of debt - inflation.

A presentation that is often opposed another version in which the State Bank (Central Bank) contributes to finance the deficit by creating money to the same state. Despite being prohibited by the proponents of the theory of Central Bank

independence, this Institute advances the Treasury still practiced. This facility can be justified by the poor performance of the tax system in some economies. As indicated earlier, the seigniorage is distinguished from the "inflation tax". The latter concept is broader. It covers the loss of the real value of public debt. This benefit available to the State is void if inflation is correctly anticipated. In general, the authorities have no interest to abuse the monetization of the debt may encourage taxpayers and discourage holders of government securities.

In accordance with the regulations, the Central Bank of Tunisia is regarded as the cashier of the Treasury. She is in charge of regulation, reimbursement and management of public debt. It provides the auctions of Treasury bills that can be transferred by the banks on a second device market. Starting from 2006 and following the amendment of the statute of the Central Bank, the assistance granted to the government in the form of advances have been deleted. (Note 10) These were distinguished in direct and indirect advances and were limited to five and ten percent of ordinary revenues of the government during the past year. Now, the contributions of the Central Bank in the government are organized in accordance with the agreement between the two parties in 1970. The standing advance amounting to 50 million dinars has an interest at 0.5% against 3% for pre-refundable.

Regarding the funding of the government's budget, the major innovation is, however, the substitution of good equipment for treasury bills from 1989. Since then, several other varieties of treasury bills have emerged: Transferable Treasury bonds (1989), Treasury bonds negotiable on the market (1993), Bonds equivalent to Treasury bonds (1999), Short Term Treasury bills (1999) and Zero coupon bonds (2006).

Equipment bonds were made by financial institutions in accordance with rules that existed before the reform of the financial sphere. These assets were non-negotiable and causing the creation of private money in favor of the state.

Notwithstanding the year 1986 which experienced a very sharp variation of the budget deficit, the two years 1989 and 1996 saw a sharp rise in the monetary base (see Figure 7). On the whole, the two curves will decelerate at the end of the period, confirming that the deceleration of the money comes with a better control of the budget deficit.

Seigniorage was higher during 1989 and 1996 which saw a significant creation of the money (see Figure 8). A rapprochement with Figure 3 (change in the budget deficit as a percentage of GDP) shows that primarily from 1997 the control of deficit is accompanied by a sharp decrease of seigniorage.

Excluding the two years that have variable outliers, the decomposition of the period into two phases confirms that on average the increase in speed income (H/GDP) is accompanied by inflation and income seigniorage higher average (see Table 6).

Given this presentation, it seems that overall, the Tunisian authorities have not abused the revenue from seigniorage to meet the deficit.

The observation of the terms of the financing of the budget shows that to ensure greater use of seigniorage, the authorities must come to raise their own resources (tax revenue and non-tax revenue) risk taking on additional debt. In the extreme case, a monetization of the deficit would go against the debtors of the government.

It appears that the state benefits little from seigniorage revenue. Rather, the private sector that benefits from the money supply during the study period (see Figure 9).

4. Conclusion

1) In Turkey, seigniorage, in the monetary sense of the term, has a greater weight than previously imagined until the end of 2001, when the Central Bank gained autonomy (institutional reforms put in place from 2001). Until then, the seigniorage was the second source of funding for the state after the internal debt. Nevertheless, the effect of the seigniorage calculated by two different methods began to decrease significantly after 2001, when the Central Bank was proclaimed independent from political authorities.

2) As for Tunisia, the authorities seem to have managed to meet the great economic equilibrium. Keeping inflation at reasonable rates goes through a rather mild a rational use of seigniorage.

In general, the analysis of the funding situation of the state budget shows that:

- The control of public deficit is accompanied by a decrease in the growth of resources and expenditures as a percentage of GDP. Both variables have an average change of 5% from one year to another during the period 2000 - 2007 with a slight advantage for expenditure (5.7% against 5.1%).

- Changes in resources ie, the sum of fiscal resources and nontax resources is mainly attributable to the sharp increase in the second component is due to the proceeds of privatization of national firms. The tidiness of this section is dependent on the ability of public authorities to find ways to offset the decline in tariffs. This solution is further complicated by the law of alleviating the tax burden on companies from 2007.

- The reconstruction of the outstanding public debt is reflected in the gradual reduction of its external debt compared to domestic clearly expressed through the multiplication of long term Treasury bills. Such a sustainable financing modality

implies that public authorities maintain inflation within a reasonable concern for equity. An increase in overall price levels might allow the State to reduce its deficit in real terms, the taxable benefit to the agents at the expense of creditors of the State.

Finally, treatment of macroeconomic data showed the weakness of seigniorage revenue as a method of financing the budget deficit in Tunisia, particularly in terms of its inflationary component (compared to its tax component). In addition, examination of the contribution of the inflation tax to total income provided by the government seigniorage shows the weakness of this component compared to the tax component. The weakness of this part inflationist both as part of the seigniorage revenue of the government is mainly due to the low rate of inflation in the long run, in Tunisia.

It thus appears that the benefit of monetary financing, in the case of the Tunisian economy is very modest. Thus, in this country, increasing the cost of debt may affect the solvency of the State and thus the sustainability of its fiscal policy. It would therefore require a more efficient management of government expenditure and ensure, as far as possible, the coordination of modes of financing the budget deficit.

References

- Aghevli, & Bijan B. (1977). Inflationary Finance and Growth. *The Journal of Political Economy*, Vol. 85, No. 6, 1295-1307.
- Akçay, O.Cevdet & Alper, C. Emre & Özmucur, Süleyman. (1997). Budget Deficit, Money Supply and Inflation: Evidence from Low and High Frequency data for Turkey. *Boğaziçi University SBE Discussions Papers*, No. 10.
- Anand, Ritu & S.Van Wijberben. (1989). Inflation and the Financing of Government Expenditure: An Introductory Analysis with in Application to Turkey. *The World Bank Economic Review*, III, 17-36.
- Bailey, Martin J. (1956). The Welfare Cost of Inflationary Finance. *The Journal of Political Economy*, Vol. 64, No. 2, 93-110.
- Buiter, Willen H. (1990). Can public spending cuts be inflationary, in *Principles of Budgetary and Financial Policy*/ed. W. Buiter, MIT Press.
- Bulut, Cihan. (2002). Kamu açıkları enflasyon, faiz oranı ve döviz kuru ilişkileri, İstanbul: DER Yayınları, ISBN 975-353-281-4, Yayın No. 340.
- Cagan, Philip. (1956). The Monetary Dynamics of Hyperinflation, in *Studies in Quantity Theory of Money sous l'édition de M. Friedman, University of Chicago Press, Chicago, IL, LXXIX: III-118*.
- De Haan, Jakob & Zelhorst, Dick & Roukens, Onno. (1993). Seigniorage in Developing Countries. *Applied Financial Economics*, Vol. 3, No. 4, 307-314.
- Dornbush, Rudiger & Fischer, Stanley, (1986). Moderate Inflation. *World Bank Economic Review*, Vol. 7, No. 1, 1-44.
- Easterly, William R. & Schmidt-Hebel, Klaus. (1996). Fiscal Deficits and Macroeconomics Performance in Developing Countries. *World Bank Research Observer*, Vol. 8, No. 2, 211-237.
- Friedman, Milton. (1971). Government Revenue from Inflation. *The Journal of Political Economy*, Vol. 79, No. 4, 846-856.
- FEMISE Report-Tunisia, December 2005
- Günaydın, İhsan. (2004). Bütçe açıkları enflasyonist midir? Türkiye üzerine bir inceleme. *Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, Vol. 6, No.1, 158-181.
- Kepenek, Yakup & Yentürk, Nurhan, (2000). *Türkiye Ekonomisi*, İstanbul: Remzi Kitabevi, p. 243-244.
- Metin, Kivilcim. (1998). The Relationship between Inflation and Budget Deficit in Turkey. *Journal of Business, Economics and Statistics*, Vol. 16, No. 4, 412-422.
- Olivera, Julio. H. (1967). Money, Prices and Fiscal Lags: a Note on Dynamics of Inflation. *Banco National del Lavaró Quaterly Review*, No. 20, 258-267.
- Phelps, Edmund. (1973). Inflation Theory of Public Finance. *Swedish Journal of Economics*, Vol. 70, 67-82.
- Sakal, Mustafa, (2002). Türkiye'de mli disiplin sorunu: kamu açıkları ve borçlanmanın sürdürülebilirliği, Ankara: Gazi Kitabevi.
- Sargent, Thomas & Wallace, Neil. (1981). Some Unpleasant Monetarist Arithmetic. *Federal Reserve Bank of Minneapolis Quarterly Review*, Vol. 5, 1-17.
- Sargent, Thomas. (1982). Beyond Demand and Supply Curves in Macroeconomics, *American Economics Review*, Vol. 72, No. 2, 382-389.
- Soylu, Hakkı. (1997). Türkiye'de Senyoraj Gelirleri ve Kamu Açıkları, *Sermaye Piyasası Kurulu, Yayın No. 81*,

Ankara..

Tanzi, Vito. (1977). Inflation, Lags in Collection and the Real Value of Tax Revenue. *IMF Staff Papers*, Vol. 24, No. 1, 154-167.

Tanzi, Vito. (1978). Inflation, Real Tax Revenue and the Case for Inflationary Finance: Theory with an Application to Argentina. *IMF Staff Papers*, Vol. 25, No. 3, 417-451.

Tanzi, Vito. (1989). The Impact of Macroeconomic Policies on the Level of Taxation and the Fiscal Balance in Developing Countries. *IMF Staff Papers, September*, Vol. 36, No. 3, 633-657.

Van Wijnbergen, Sweder. (1989). Growth, External Debt, and the Real Exchange Change in Mexico. *The World Bank Policy, Planning and Economic Research Working Papers Series*, Working Paper No. WPS257.

Web Sites: www.tcmb.gov.tr

www.bct.gov.tn

Notes

Note 1. In 1999, extra-budgetary funds constituted 0.6% of GNP while they were -1.3% of GDP and -0.9% in 2000 and 2001 respectively (Source: National Planning Institute)

Note 2. The IMF says that about a third of the prices is included in the CPI.

Note 3. Preliminary conclusions of the mission of consultation under Article IV on 9 June 2008 and 16 January 2008.

Note 4. In 2006, an increase in tax revenues was also driven by the profits of the Central Bank of Tunisia, which was the main product of state participation. Central Bank of Tunisia, Annual Report. June 2007.

Note 5. These Treasury bonds to zero coupons. Central Bank of Tunisia, Annual Report, June 2007.

Note 6. Central Bank of Tunisia, Annual Report, June 2007.

Note 7. World Bank Report. October 2004.

Note 8. Central Bank of Tunisia, Annual Reports 2006 and 2007.

Note 9. At the date of 2007, the structure of international debt is composed of up to 58.7% in Euros.

Note 10. Law No 2006-26 of 15 May 2006. Journal Officiel de la République Tunisienne, 19 May 2006.

Table 1. Ratio of public debt and its composition en percentage of GDP, Tunisia

| Year | 2004 | 2005 | 2006 | 2007 |
|---------------|------|------|------|------|
| Internal Debt | 21,9 | 21,0 | 21,7 | 21,2 |
| External Debt | 37,5 | 37,3 | 32,2 | 29,7 |
| Total Debt | 59,4 | 58,3 | 53,9 | 50,9 |

Table 2. Debt service (in Millions of Dinars, Tunisia)

| Year | 2004 | 2005 | 2006 | 2007 |
|-----------|--------|--------|--------|--------|
| Debt | 4756,6 | 3833,5 | 3914,4 | 3921,4 |
| Principal | 3486,6 | 2771,4 | 2784,6 | 2739,5 |
| Interests | 989,0 | 1062,1 | 1129,8 | 1181,9 |

Table 3. Budget Revenues of the Government (in millions Dinars, Tunisia)

| Year | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|
| Fiscal Revenues | 5678,4 | 6221,5 | 6429,2 | 6653,3 | 7251,9 | 7904,3 | 8469,6 | 9285,0 |
| Non-fiscal Revenues | 1194,1 | 874,1 | 1423,3 | 1166,9 | 1464,5 | 1376,0 | 2082,4 | 2051,0 |
| Internal Debts (Treasury bonds less than 1 year are not included) (A) | 1797,8 | 1851,1 | 1760,1 | 2082,1 | 2596,8 | 1601,9 | 1445,6 | 1442,2 |
| External Debts (B) | 1265,9 | 1932,6 | 1608,1 | 1653,3 | 1427,7 | 1407,3 | 772,3 | 1015,3 |
| B/(A+B) en % | 30,8% | 34,7% | 30,0% | 32,3% | 31,5% | 24,4% | 17,4% | |

Table 4. Distribution of seigniorage, Turkey

| | Part of State | Part of Private Sector | Total Seigniorage |
|------------------|---------------|------------------------|-------------------|
| 1987Q3 – 1994Q2 | 2,7 | 0,5 | 3,2 |
| 1994Q3 – 2000 Q3 | 2,8 | 0,0 | 2,8 |
| 2000Q4 – 2001Q3 | 10,3 | 0,0 | 10,3 |
| 2001Q4 – 2004Q4 | 1,1 | 0,0 | 1,1 |

The observation of Table 4 reveals two main observations:

- First: The private sector has benefited from seigniorage during 1988-1994 only. The amount of the seigniorage has varied between 0.5% and 1% of GNP. During these years, the Central Bank of Turkey has granted loans to the private sector to be able to compensate for actual losses due to high inflation.
- Second: The seigniorage has been an enormous amount during the crisis 2000-2001. He recorded an average 16% of GNP (in the third quarter of 2001 seigniorage reached its highest level with 35% of GNP). This raise reflects the desire of the state to compensate its losses which have been caused by the high number of bank failures and the net outflows in the short term (by putting liquidity into circulation by seigniorage).

Table 5. The modalities of financing the deficit, Turkey

| | Net Externe Debt / PNB | Net Interne Debt / PNB | Short-term / PNB | Seigniorage | Deficits / PNB |
|---------------|---------------------------|---------------------------|------------------|-------------|----------------|
| 1987Q3-1997Q1 | -0,010 | 0,090 | 0,023 | 0,031 | 0,098 |
| 1998Q1-2003Q4 | 0,032 | 0,226 | 0,000 | 0,033 | 0,277 |
| 2000Q1-2001Q3 | 0,010 | 0,197 | 0,000 | 0,071 | 0,245 |
| 2001Q3-2003Q4 | 0,078 | 0,230 | 0,000 | 0,026 | 0,335 |

We note in Table 5, that in the 1990s the external debt in the financing of the budget deficit does not lose its importance, but also that the government is increasingly using the internal debt to repay part of its external debt. The permanent debt of the public sector raises interest rates and inflation.

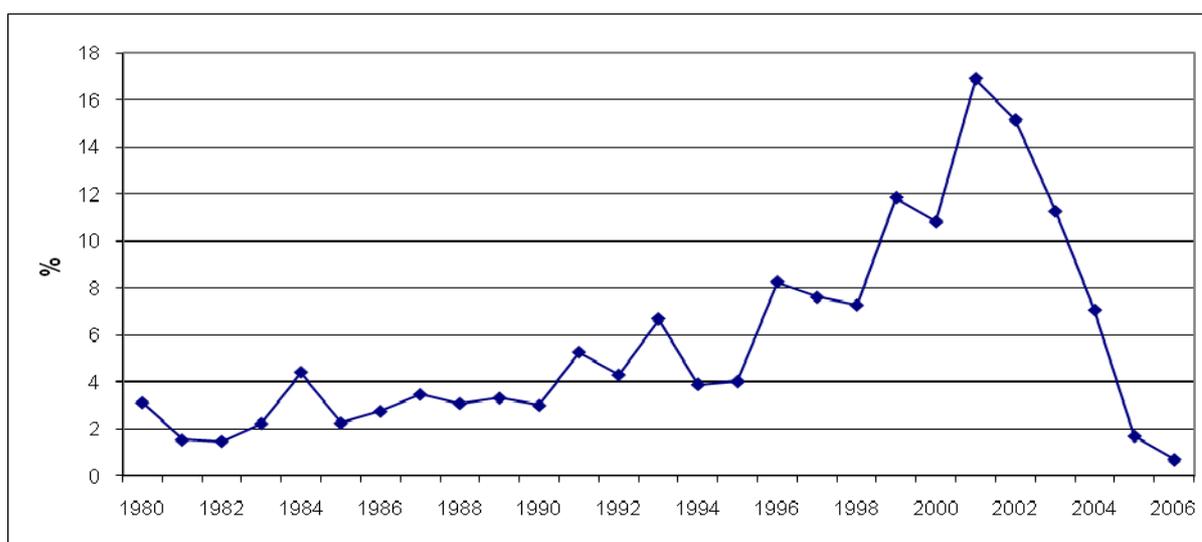


Figure 1. Evolution of public deficit (in % of GDP, Turkey)

This figure shows the substantial and unexpected increase of public deficit as a percentage of GDP during 1980 and 1990 due to the decisions which were intended to reduce the role of the State in the economy.

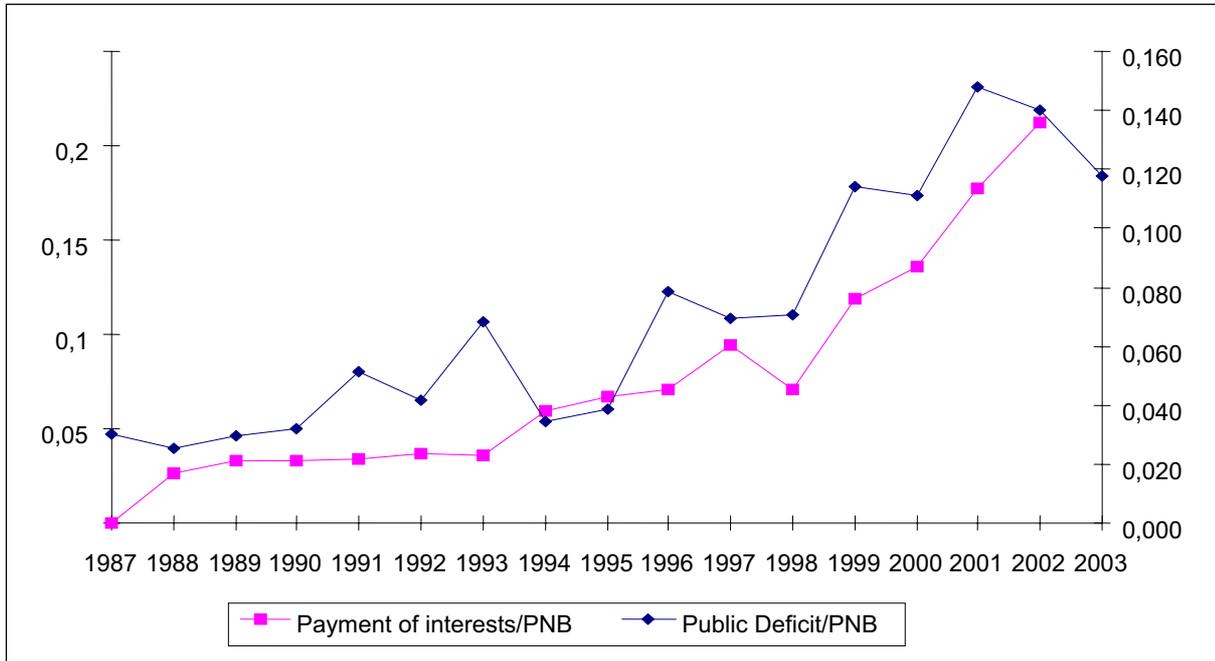


Figure 2. Evolution of part of deficit and payments of interests of consolidated budget (in % of GDP, Turkey)

As seen in Figure 2, there appears to be a strong correlation between changes in the public deficit and changes in interests payment. The increase in debt largely explains the increase in the deficit.

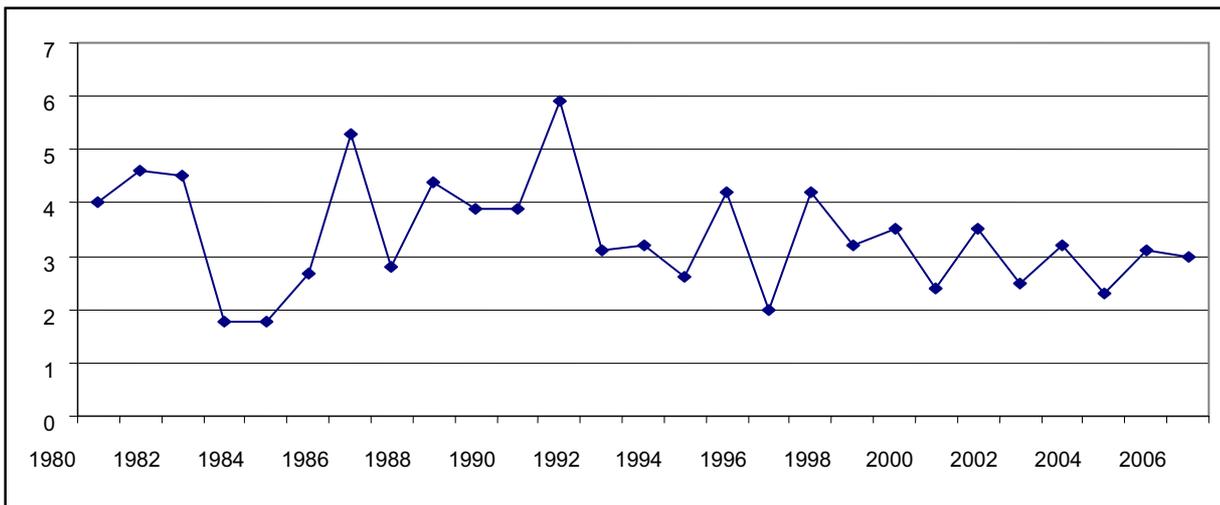


Figure 3. Evolution of budget deficit in percentage of GDP (1980–2006, Tunisia)

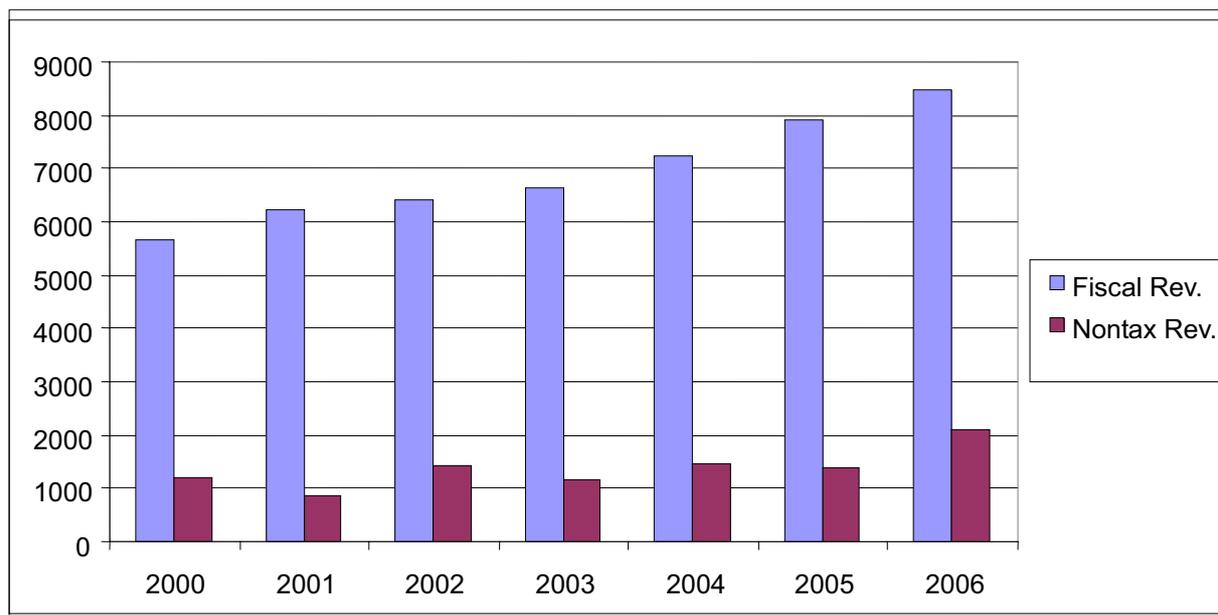


Figure 4. Evolution of fiscal revenues and nontax revenues (2000-2006, Tunisia)

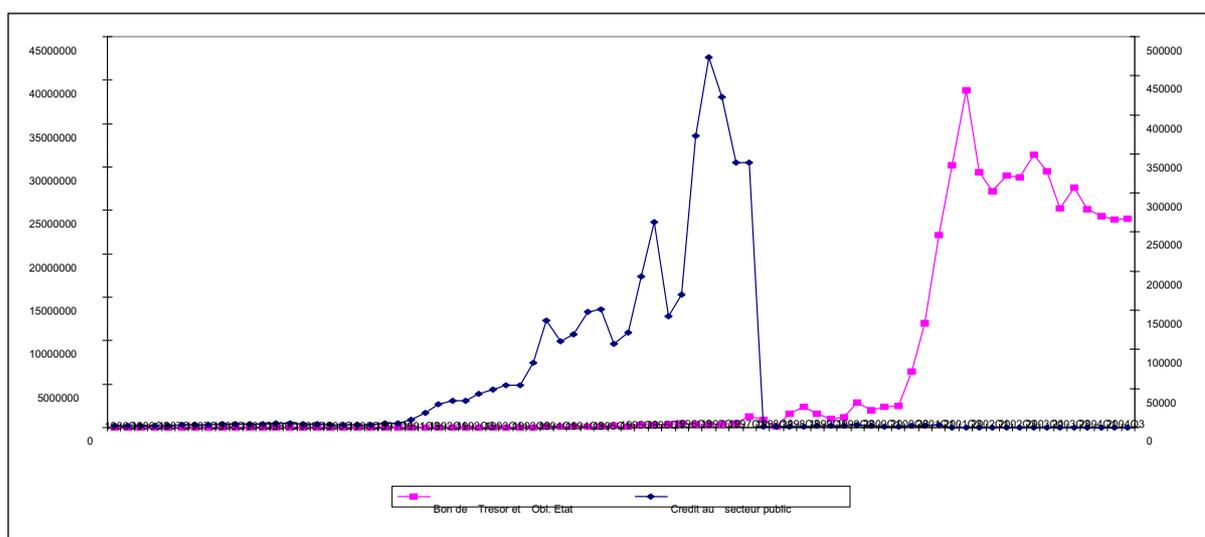


Figure 5. Treasury bonds and credits to public sector in the balance sheet of Central Bank (in milliards current TL, Turkey)

Figure 5 shows that one of the major events that have influenced deficits and seigniorage as state funding has held in the first quarter of 1998. This is the moment when the short-term advances of the Central Bank towards the Treasury as well as other funding from the Central Bank to the public sector are stopped.

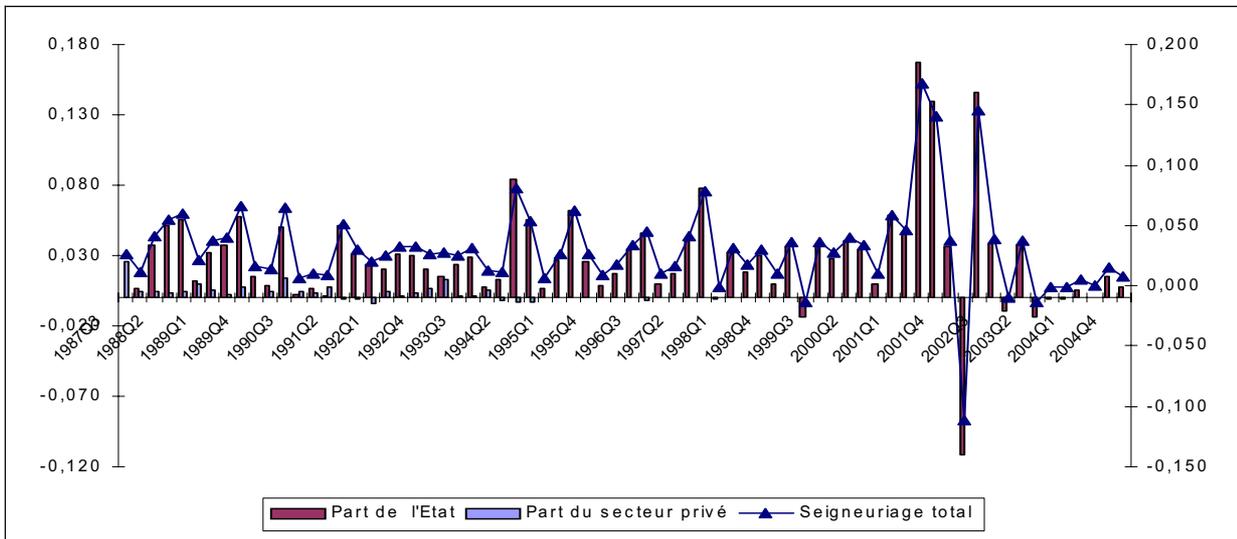


Figure 6. Part of seigniorage in GNP and its distribution between public and private sectors
(1988-2003, Turkey)

Figure 6 reflects the distribution of seigniorage revenue between the private and public sectors. This decomposition has been obtained from the difference between the monetary base and adjusted monetary base (the monetary base less loans to the private sector and private institutions by the Central bank of Turkey). Results shown in Figure 6 are summarized in Table 4 given the periods previously suggested.

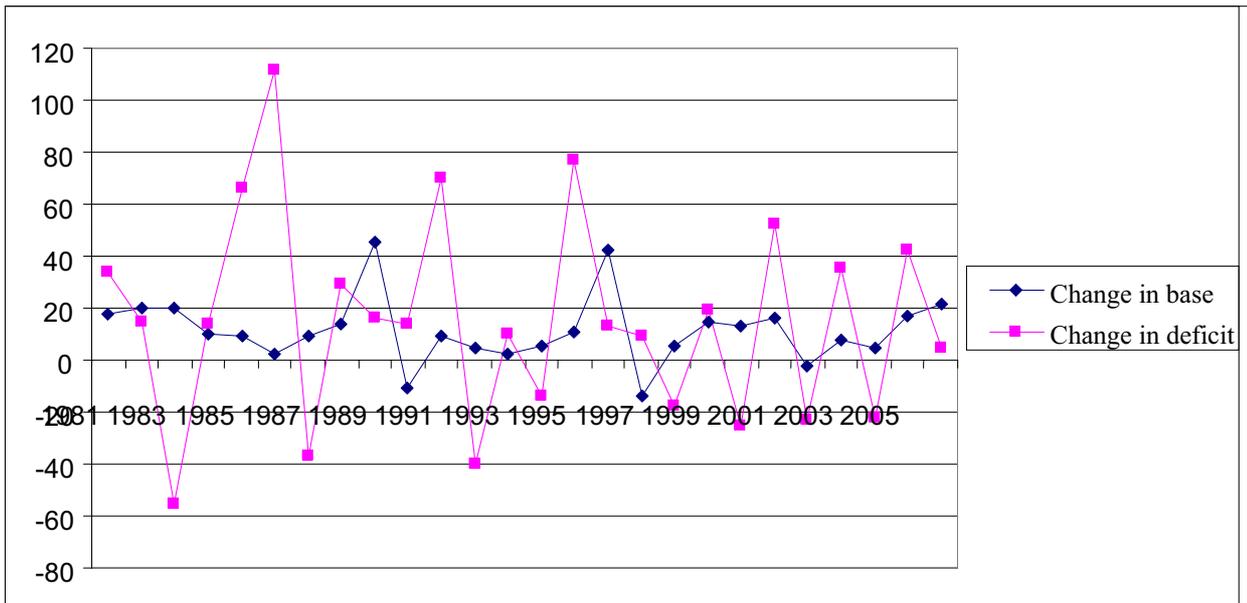


Figure 7. Evolution of monetary base and public deficit, Tunisia

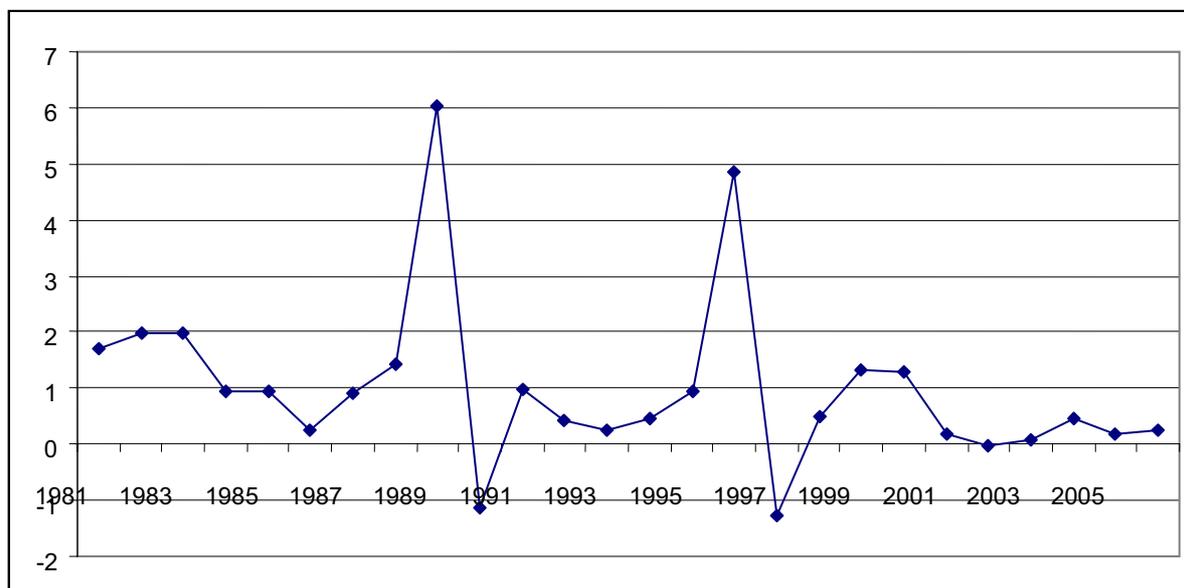


Figure 8. Variation of seigniorage's revenue (1981-2006, Tunisia)

Figure 8 shows the evolution of seigniorage revenue calculated as the product of the growth of the monetary base and the inverse of income velocity of monetary base.

Table 6. Inflation, seigniorage and velocity (1981–2006, Tunisia)

| Period | Inflation | H/PIB | Revenue of seigniorage |
|-------------|-----------|-------|------------------------|
| 1981 – 1996 | 7, 7% | 9,6% | 0,85% |
| 1997 – 2006 | 3,1% | 5,1% | 0,29% |

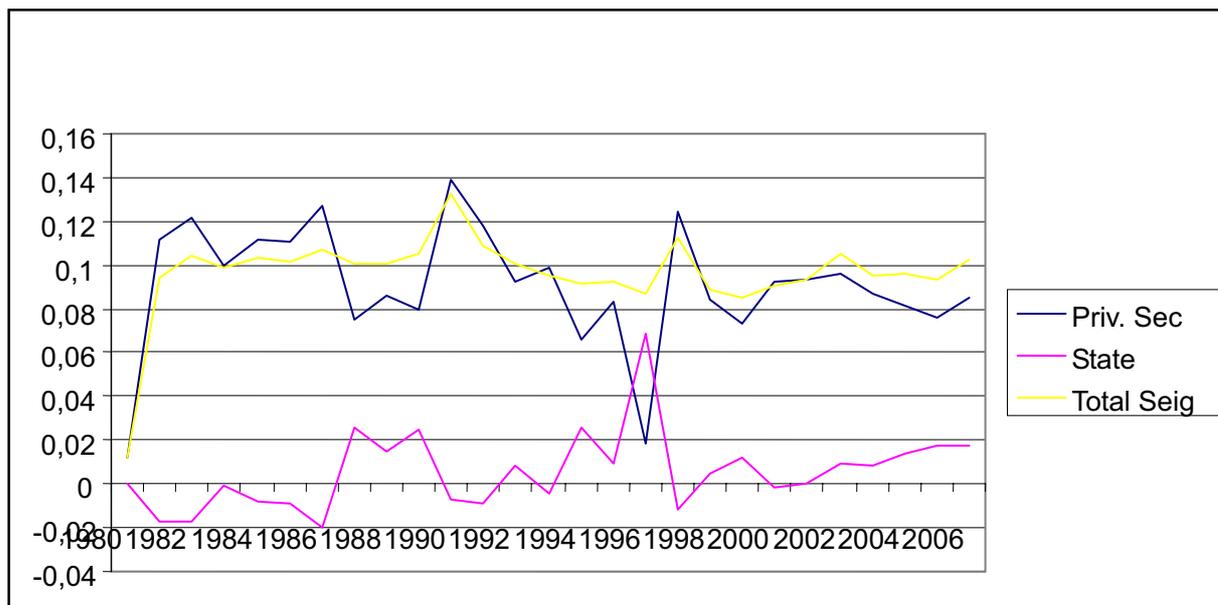


Figure 9. Evolution of seigniorage and its components (1980-2006, Tunisia)

Appendix

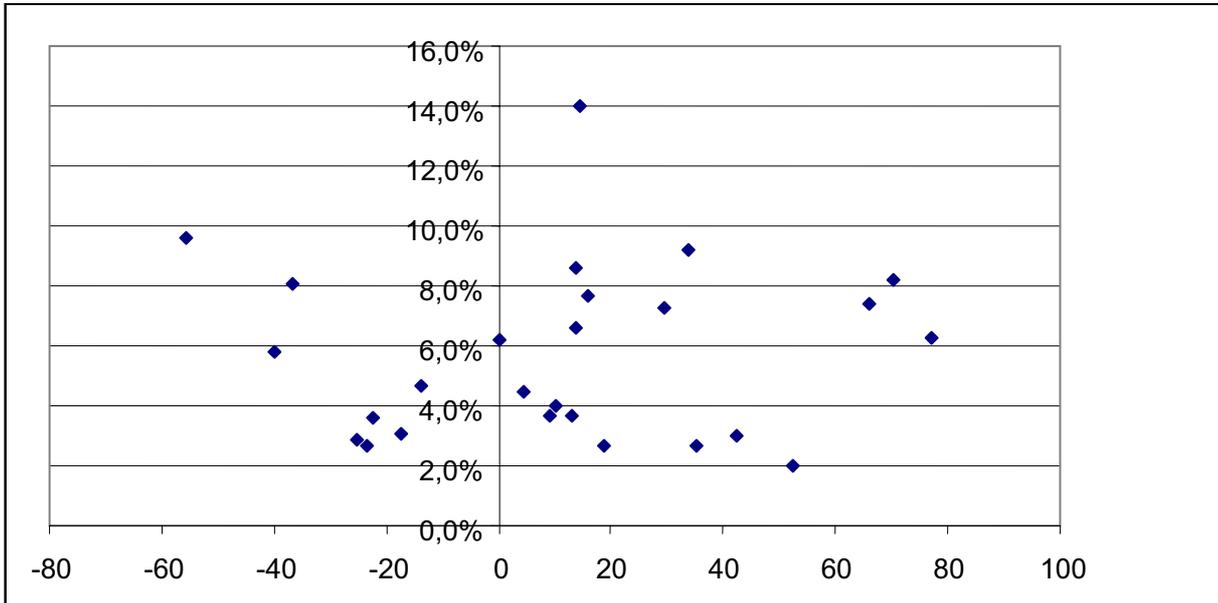


Figure A1. Evolution of public deficit and inflation rate, Tunisia

Table A1. Evolution of outstanding Treasury bills given maturities, Tunisia

| Maturity | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|----------|-----------|-------------|-------------|-------------|-------------|-------------|
| 13 weeks | 2,3 | == | == | == | == | |
| 26 weeks | 9,0 | == | == | == | == | |
| 52 weeks | 25 | 26,2 | 12,7 | 8,8 | 8,0 | 8,4 |
| 2 years | 4,4 | == | 1,2 | 3,9 | == | |
| 3 years | 6,3 | 5,6 | 5,8 | 10,1 | 10,7 | |
| 4 years | 22,1 | 23,4 | 12,1 | == | == | |
| 5 years | 5,47 | 10,5 | == | 11,6 | 10,3 | 9,8 |
| 6 years | == | == | == | == | 4,2 | 6,5 |
| 7 years | == | == | == | == | 1,5 | 5,6 |
| 10 years | 17,2 | 15,2 | 48,5 | 48,5 | 50,3 | 53,7 |
| 12 years | 7,8 | 18,9 | 16,8 | 16,8 | 14,6 | 13,8 |
| 15 years | == | == | == | == | == | 1,9 |

Table A2. Principals Parameters of Financing (in %), Tunisia

| | 2005 | 2006 | 2007 |
|--|-------|-------|-------|
| Total Debt / PIB current prices | 129,9 | 123,6 | 119,7 |
| Intern Debt / PIB | 81,9 | 81,4 | 80,9 |

Table A3. A Summary of Total Debt in Tunisia in MDT

| Designation | 2003 | 2004 | 2005 | 2006 |
|-----------------------------|---------------|---------------|---------------|---------------|
| Total Debt (TD) | 43.112 | 46.281 | 49.043 | 51.203 |
| State | 19.307 | 20.519 | 21.693 | 22.239 |
| Others Non-Financial Agents | 23.805 | 25.750 | 27.423 | 28.964 |
| Intern Debt | 27.625 | 29.277 | 30.936 | 33.741 |
| State | 6.778 | 7.310 | 7.667 | 8.956 |
| Others Non-Financial Agents | 20.847 | 21.967 | 23.269 | 24.785 |
| Financial System | 23.628 | 25.445 | 27.054 | 29.612 |
| State | 3.289 | 3.825 | 4.166 | 5.164 |
| Others non-Financial Agents | 20.339 | 21.620 | 22.888 | 24.448 |
| Capital Markets | 3.997 | 3.832 | 3.882 | 4.129 |
| Monetary Market | 357 | 228 | 280 | 236 |
| State | 0 | 0 | 0 | 0 |
| Others Non-Financial Agents | 357 | 228 | 280 | 236 |
| Bond Market | 3.640 | 3.604 | 3.602 | 3.893 |
| State | 3.498 | 3.485 | 3.501 | 3.792 |
| Others Non-Financial Agents | 151 | 119 | 101 | 101 |
| Extern Debt | 15.487 | 17.004 | 18.106 | 17.462 |
| State | 12.529 | 13.209 | 14.025 | 13.283 |
| Others Non-Financial Agents | 2.958 | 3.795 | 4.081 | 4.179 |