

Halicioglu, F. (1998) “ Active and Passive Seigniorage Revenues: The Case of Turkey 1970-1997”
paper presented at International Conference in Economics II, Economic Research Center, Middle East
Technical University, Ankara, Turkey, September 1998.

**ACTIVE AND PASSIVE SEIGNIORAGE REVENUES: THE
CASE OF TURKEY 1970-1997**

Dr.Ferda Halicioglu

Correspondence to:

Dr.Ferda Halicioglu

Department of Economics,

Business School

University of Greenwich

London, SE10 9LS

E-mail:R.F.Halicioglu@gre.ac.uk

Halicioglu, F. (1998) “ Active and Passive Seigniorage Revenues: The Case of Turkey 1970-1997” paper presented at International Conference in Economics II, Economic Research Center, Middle East Technical University, Ankara, Turkey, September 1998.

**ACTIVE AND PASSIVE SEIGNIORAGE REVENUES:
THE CASE FOR TURKEY 1970-1997**

Dr.Ferda Halicioglu

Department of Economics, University of Greenwich

Abstract

This study is concerned with the components of the total seigniorage revenues that have been collected by the Turkish governments during the years 1970-1997.

Traditionally, a government can increase the monetary base in order to finance its expenditures partially. This form of monetary finance is related to active seigniorage revenues. On the other hand, as real economic growth takes place, a government can also benefit from this process as a result of an increase in demand for the real money balances which is termed as passive seigniorage revenues.

This paper presents empirically that Turkish governments have benefited from both types of seigniorage revenues in order to finance its budget deficits during the years 1970-1997 but this policy seems to lose its effectiveness in the recent years due to the financial liberalization.

Key Words: Seigniorage, Monetary, Policies, Budget Deficits.

JEL Classification: E52, E62

I.INTRODUCTION

In the monetary economics, the ability of a government to finance its outlays (expenditure and lending) by issuing paper money is called inflationary finance or seigniorage. In other words, seigniorage represents the amount of resources that a government gains by exercising its right of monopoly in issuing fiat money. The monetary economics literature on the concept and measurement of seigniorage has been growing rapidly especially since the 1970s. Except for few studies, the existing literature seem to have been concentrated mainly on the total seigniorage revenues and its optimality. Even though several studies have distinguished the different components of seigniorage, only a few of these studies have attempted to measure the extents of these components of seigniorage empirically.

However, as far as this study is concerned the components of seigniorage as described by Fischer (1982), i.e. active and passive seigniorage, have not been measured empirically yet. Thus, this study aims at measuring the extent of these components of seigniorage in the case of Turkey.

Thus, this paper is formed as follows: Section II presents some basic definitional issues on seigniorage. Section III briefly introduces the measurement method that is being used in measuring active and passive seigniorage. Section IV presents the estimation results and compare them to the previous empirical studies relating to Turkey. The last section draws some conclusions.

II.BASIC CONSIDERATIONS FOR SEIGNIORAGE

In the monetary economics literature, the concept of seigniorage, in general, is being used along side the concept of tax. For example, Friedman (1971) sees the issue of fiat money as a tax on cash balances since the government has the right of the sole issuer of money and all

money is non-interest bearing (Friedman, 1971, 846). Governments that issue fiat money might find inflation an efficient method to finance government expenditures as put by Ertugrul (1979) (Ertugrul, 1979, 86). This form of inflationary finance or seigniorage is a time-honoured source of government that was originally accrued to medieval money-issuing lords in amounts equalling the difference between the face value of money and its minting costs (Cody, 1991, 73).

There might be some more justifications for the right of seigniorage as indicated by Cukierman *et al.* (1992) which argue that seigniorage reflects high costs of administering and enforcing the collection of regular taxes (Cukierman, *et al.*, 1992, 537). Seigniorage is a relatively inexpensive source of government revenue if there is especially widespread tax evasion or if there are large collection costs. Seigniorage also reflects the inability to reach any policy decision rather than being due to costs of enforcing and administering tax collections. Fischer (1982) argues that the right to print paper money is peculiarly important in providing government with a ready source of finance in an emergency such as at war-times (Fischer, 1982, 297). Nevertheless, seigniorage may have the same distorting welfare effect as inflation, as the increases in monetary base may lead to increases in prices by causing decreases in the purchasing power of money. Several considerations have been given to this issue, especially regarding the social cost of taxation in the form of seigniorage (see Marty (1967), (1973) and (1976), Barro (1972) and Mankiw (1987)).

The modern monetary economics literature on seigniorage presents basically three important factors in determining the level of seigniorage revenues in a steady-state situation. The first factor is related to an increase in the level of monetary base and inflation level. The second factor is related to an increase in the level of real income. And the last factor is related to the rate of required reserves for the

commercial banks (Bilgili, 1997, 97). Therefore we write a simple seigniorage function with the corresponding signs as follows:

$$s = f((H = \pi)^+, g^+, rr^+)$$

where s is seigniorage revenues, H is the level of monetary base, π is inflation rate, g is real income growth rate and rr is required reserves rates for the commercial banks.

Assuming that economy is in a steady-state, an increase in the level of monetary base (or inflation) will give rise to a disequilibrium at money and goods markets. As a result of this initial increase in monetary base, the public's real cash holdings will start to fall, unless there is a corresponding real income increase to compensate for the adverse effect of the initial increase in monetary base. Thus, the initial increase in the monetary base (or inflation) will have the same impact as a tax on the purchasing power of money. Having mentioned this point, it is assumed that governments are able to influence the level of monetary base and able to use it as a tax base. The implicit assumption made here is that central banks do not have independence. The classical monetary economists are mainly concentrated on this component of seigniorage as a result of their explicit assumption that governments can actively pursue a policy of increasing the monetary base in order to finance their expenditures: see Marty (1967), Friedman (1971) and Auernheimer (1974). As far as the passive seigniorage is concerned, it is assumed that an increase in real income gives rise to an increase in demand for real cash balances even if the inflation does not exist. Thus, this form of seigniorage takes place without the government's active involvement. This form of seigniorage was implicitly distinguished for the first time by Friedman (1971) and Marty (1973) and was explicitly put forward by Fischer (1982).

The last component of seigniorage is derived from the deposit and capital requirements of commercial banks that are held by the central

banks and which bears no interest or interest lower than market rates. Assuming that the level of the required reserve rates are set by the central banks, governments may also use this financial instrument as part of tax base as indicated by Rovelli (1994) (Rovelli, 1994, 30). On the other hand, Seigel (1981) argues that this form of seigniorage will be higher if the banking system is competitive rather than monopolized, since deposit rates are lower under the monopoly banking system (Siegel, 1981, 355). Nevertheless, except Rovelli (1994), all the empirical studies on the level of seigniorage revenues uses the variable of monetary base in their calculations which is inclusive of the reserve requirements. This procedure is also adopted in this study. Therefore we face only two types of seigniorage, as defined by Fischer (1982). The first one is derived from an increase in the level of monetary base which government may actively pursue this policy in order to finance its expenditures. This form of seigniorage is called active seigniorage. The second type of seigniorage is derived from an increase in the level of real income which also increases demand for real cash balances. This form of seigniorage is not influenced by the government's policy directly and is called passive seigniorage (Fischer, 1982, 300-301).

III.MEASUREMENT METHOD

The traditional Cambridge money demand equation can be used to derive a measure of seigniorage. Thus, in this equation, the demand for money holdings as:

$$M=kPY \quad (1)$$

or

$$M/P=kY \quad (1a)$$

where M is the level of the monetary stock or monetary base, P is the price level, Y is the level of nominal income and k is the money

holdings' multiplier. Similarly if we write the Fischer type quantity equation as follows:

$$MV=PY \quad (2)$$

where V is the velocity of money.

If we take the logarithmic differentiation of equation (1a) with respect to time and performing some manipulation on it, we can show that total (s) seigniorage revenues equal:

$$s = \dot{M}/P = (\dot{Y}/Y + \dot{P}/P)kY = (g + \pi)kY \quad (3)$$

According to equation (3), sources of seigniorage revenues are determined by the real economic growth (g) and by the inflation rate (π). The equation (3) also implies that economic expansion allows the government to earn seigniorage at a constant inflation rate, which is termed by Fisher (1982) as passive seigniorage. On the other hand, a rising price level reduces the real value of money balances and governments can accommodate the public's increased nominal money demand by printing more money. This form of finance is defined as active seigniorage.

In the equation (3), gk represents the passive seigniorage rate and πk represents active seigniorage rate. Thus, the components of the total seigniorage revenues in a more explicit forms are as follows:

$$ps = gkY \quad (3a)$$

$$as = \pi kY \quad (3b)$$

where ps is the passive seigniorage revenues and as is the active seigniorage revenues.

Halicioglu, F. (1998) “ Active and Passive Seigniorage Revenues: The Case of Turkey 1970-1997” paper presented at International Conference in Economics II, Economic Research Center, Middle East Technical University, Ankara, Turkey, September 1998.

IV.RESULTS AND EVALUATIONS

Active, passive and total seigniorage revenues are estimated by using equations (3), (3a) and (3b) for the period of 1970-1997 and presented in Appendix 2. To draw some evaluations on the extent of active, passive and total seigniorage revenues Table 1 and Table 2 are prepared.

Halicioglu, F. (1998) “ Active and Passive Seigniorage Revenues: The Case of Turkey 1970-1997”
 paper presented at International Conference in Economics II, Economic Research Center, Middle East
 Technical University, Ankara, Turkey, September 1998.

**Table 1: Active and Passive Seigniorage
 As % of National and Public Income: 1970-1999**

Years	ASRY	PSRY	SY	ASRTPR	PSRTPR	SRTPR	g	π	BDY
1970	1.01	0.47	1.49	6.01	2.87	8.89	4.4	9.5	0.14
1971	1.97	0.81	2.78	11.25	4.96	16.22	7.0	17.0	-2.14
1972	1.98	1.18	3.17	10.92	6.78	17.70	9.2	15.5	0.00
1973	2.55	0.59	3.15	14.25	3.73	17.98	4.9	21.0	-0.70
1974	2.92	0.37	3.29	17.62	2.64	20.27	3.3	26.0	-0.78
1975	1.33	0.71	2.05	7.56	4.19	11.76	6.1	11.4	-0.20
1976	2.04	1.06	3.10	10.52	5.76	16.29	9.0	17.3	-0.49
1977	3.89	0.41	4.30	18.04	2.26	20.31	3.0	28.5	-3.98
1978	7.03	0.15	7.19	26.35	0.79	27.14	1.2	53.6	-1.46
1979	8.43	-0.05	8.38	30.81	-0.29	30.51	-0.5	75.1	-2.30
1980	8.61	-0.26	8.34	32.64	-1.52	31.12	-2.8	90.3	-2.99
1981	3.34	0.47	3.81	15.67	2.55	18.22	4.8	34.1	-1.19
1982	3.13	0.35	3.48	18.00	2.40	20.41	3.1	27.6	-1.30
1983	3.07	0.45	3.53	14.57	2.48	17.05	4.2	28.1	-1.94
1984	4.61	0.70	5.32	25.07	4.86	29.93	7.1	46.4	-5.03
1985	3.53	0.36	3.90	17.90	2.19	20.10	4.3	41.7	-0.09
1986	2.16	0.53	2.70	14.34	3.97	18.31	6.8	27.5	-2.37
1987	3.13	0.78	3.92	19.22	5.60	24.83	9.8	39.3	-3.86
1988	5.34	0.13	5.47	29.09	1.00	30.10	1.5	60.8	-3.58
1989	4.74	0.11	4.86	25.84	0.85	26.69	1.6	65.0	-3.25
1990	2.90	0.52	3.42	16.88	3.52	20.41	9.4	52.3	-2.93
1991	3.42	0.18	3.61	17.99	1.17	19.17	3.0	55.3	-4.91
1992	4.43	0.45	4.89	21.93	2.81	24.74	6.4	62.1	-4.2
1993	3.42	0.47	3.89	16.28	2.62	18.90	8.1	58.4	-6.70
1994	5.88	-0.29	5.58	23.29	-1.55	21.73	-6.1	120.7	-3.75
1995	4.37	0.39	4.76	19.65	2.16	21.82	8.0	88.5	-4.03
1996	3.11	0.30	3.41	14.63	1.64	16.27	7.4	75.9	-8.08
1997	3.77	0.33	4.10	15.76	1.61	17.37	8.1	92.5	-7.52
1998									
1999									

Note: see Appendix 1 for data definitions.

When we look at the components of total seigniorage revenues during the estimation period, especially active seigniorage revenues seem to be fluctuating considerably and have the largest share in the total seigniorage revenues as expected. As far as the fluctuations in active seigniorage revenues are concerned, the fluctuations in the inflation rates in the 1970s seem to be creating proportionate active seigniorage revenues. For example, in the first half of 1970s, the moderate inflation rates give rise to moderate active seigniorage revenues. However, as the rate of inflation started to increase sharply in the second half of the 1970s, the share of active seigniorage revenues in the GNP increased sharply too. Indeed, in the years of 1979 and 1980, active seigniorage revenues reached their peak points which are 8.43 per cent and 8.61 per cent respectively. In the same years, the inflation rates also reached their peak point. Nevertheless, this considerably good proportionate relation between active seigniorage and inflation seem to be weakened in the 1980s and 1990s. For example, almost the same inflation rate in 1987 like 1980 has produced a lot less active seigniorage revenues in 1997. There are several other years after the 1980s that prove the above-mentioned points. One of the reasons in explaining the weakening relation between inflation rates and active seigniorage revenues could be that the years of 1980s and 1990s are very different from the years of 1970s in terms of financial and economic structure. Indeed, the 1970s Turkey experienced a lots of upheavals, external prices shocks such as rampant price increases in crude oil and negative interest rates and unrealistic exchange rates; whereas, the 1980s and 1990s Turkey have established free market economy principles, financial liberalizations, deregulations, and economic integrations. Consequently real interest rates, realistic exchange rates and financial liberalization have all resulted in a large scale of financial substitution especially in the form of currency, which has started to limit the scope of active seigniorage revenues. As indicated by Nichols (1973), the existence of flexible exchange rates brings about an avoidance of domestic currency unless it

Halicioglu, F. (1998) “ Active and Passive Seigniorage Revenues: The Case of Turkey 1970-1997” paper presented at International Conference in Economics II, Economic Research Center, Middle East Technical University, Ankara, Turkey, September 1998.

is absolutely necessary (Nichols, 1973, 424). On the other hand, Fischer (1982) argues that even for a country that fixes its exchange rates, it still loses seigniorage if it does not use its own currency (Fischer, 1982, 295).

As we look at the contribution of active seigniorage revenues to government deficits, we see that active seigniorage revenues as percentage of public revenues have also reached their peak points in the years of 1979 and 1980 which are 30.81 per cent and 32.64 per cent respectively. That indicates that active seigniorage revenues were a good income resource to shrink the government deficits during these periods. Nevertheless, this policy does not have a regular pattern, but we may say tentatively that the Turkish governments used active seigniorage policy during the general election periods in 1977, 1983, 1987 and 1991 since active seigniorage revenues as a percentage of total public revenues seem to be differ sharply before and after the election periods. For example, the share of the active seigniorage in the total public revenues in 1976 was 10.52 per cent but it increased to 18.04 per cent and it went up further in the subsequent three years by reaching 32.64 per cent in 1980. The last quarter of the 1970s in the Turkish political life was one of the most instable period, which led to several coalition governments and byelections and eventually to a military regime in 1980. Then in due course, the share of the active seigniorage revenues fell to the levels of the mid 1970s until the military regime was over in 1983. The resumed democratic life after 1983 and subsequent general elections gave rise to sharp increases in the rate of active seigniorage rates. However, the large scale capital account liberalization in 1988 did seem to have an adverse effect on this policy. Another tentative reason for the decrease in active seigniorage revenues as a percentage of public revenues in the 1990s is that the Turkish central bank appears to be a little more independent in its operations. As indicated by Cukierman, *et al.*(1992), the higher the independence of

the central bank, the lower is inflation and therefore seigniorage (Cukierman, *et al.* 1992, 554).

As far as passive seigniorage revenues are concerned, the pattern is as expected, i.e. its positive as the real growth rate is positive or *vice versa*. Nevertheless, its contribution and absolute magnitude also presents a fluctuating pattern which is more or less following the pattern of active seigniorage revenues. The absolute share of passive seigniorage in GNP reached its climax in the year of 1972 which is estimated to be 1.18 per cent. In the same year in question, the real growth rate was 9.2 per cent which is the third highest rate after 1987 and 1990. As in the case of active seigniorage and inflation rates, the relation between passive seigniorage and real growth rates seem to be getting weaker in the 1980s and 1990s. Probably, the same tentative reasons that have been made for active seigniorage almost hold the same for total seigniorage as well. Total seigniorage revenues are evaluated via Table 2. The table 2 presents the results of previous studies on total seigniorage revenues relating to Turkey. As we look at Table 2, we see that over the years, the share of seigniorage revenues in GNP appear to be estimated consistently. As the table 2 reveals, the previous studies on seigniorage in Turkey produce quite similar results. Nevertheless, the total seigniorage revenues on average seem to be significantly larger in the 1970s, 1980s, and 1990s compared to the 1960s. These results indicate that due to political instability in the last three decades, the Turkish governments prefer still prefer to adopt the inflationary monetary policies to finance ever increasing budget deficits even though this policy is not as efficient as it used to be in the 1970s and the 1980s. For example, the table 1 indicates that the total seigniorage revenues in the 1970s and 1980s were more than sufficient to cover the budget deficits. This policy seem to have lost its effectiveness for the 1990s due to the financial liberalization in the late 1980s and in the 1990s. Consequently the seigniorage revenues are far from covering the budget deficits especially in the last quarter of the 1990s.

Halıcıoğlu, F. (1998) “ Active and Passive Seigniorage Revenues: The Case of Turkey 1970-1997” paper presented at International Conference in Economics II, Economic Research Center, Middle East Technical University, Ankara, Turkey, September 1998.

**Table 2: Total Seigniorage Revenue Estimates in Turkey: A Comparison
(% of GNP)**

Author	Periods			
	1960-69	1970-79	1980-89	1990-97
Ertuğrul (1979:89)	n.a.	4.42 ¹	n.a.	n.a.
Fischer (1982:308)	1.9 ²	3.7 ³	n.a.	n.a.
Küçüker, et al.(1994:151)	n.a.	n.a.	3.36 ⁴	n.a.
Akçay(1995:221)	n.a.	n.a.	3.57	n.a.
Bilgili (1997:110)	1.61	3.76	2.81 ⁵	n.a.
Halıcıoğlu (1998)	n.a.	3.89	4.53	4.20

¹ Average of 1970-1978

² Average of 1960-1972

³ Average of 1973-1978

⁴ Average of 1983-1992

⁵ Average of 1980-1990

V.CONCLUSION

This paper examined active and passive seigniorage finance in Turkey for the period of 1970-1997. According to the empirical results, particularly active seigniorage has been a major source of revenue for the Turkish governments. Considering the significant financial deregulation and liberalization and economic integration processes which have taken place in the 1980s and 1990s, active seigniorage still has an important share in the total public income even though it is decreasing. Nevertheless, this form of financing gives rise to the concerns for the welfare distributions which have not yet been solved fully as indicated by Spaventa (1986) (Spaventa, 1986, 557). Moreover, as Bruno and Fischer (1990) have put forward, there may be both a high and a low inflation equilibrium when the government finances through seigniorage (Bruno and Fischer, 1990, 353). As far as this study is concerned, however, the results of this study need to be evaluated with caution since this study is primarily concerned with decomposing of components of seigniorage in Turkey for the estimation period. The results reveal that active seigniorage constitutes an undisputedly high share in total seigniorage. However, one cannot rule out the significant contribution of passive seigniorage to total public revenues either.

APPENDIX 1

DATA DEFINITIONS AND SOURCES

- ASR : Nominal active seigniorage revenues, (billion TL).
- ASRY : Nominal active seigniorage revenues as percentage of nominal GNP.
- ASRTPR : Nominal active seigniorage revenues as percentage of nominal public revenues which is also inclusive of nominal active seigniorage revenues.
- BDY : Consolidated budget deficits as percentage of nominal GNP.
- BDEFICIT : Nominal consolidated budget deficits, (billion TL).
Source: SSI.
- GEXPENSE : Nominal consolidated public expenditures, (billion TL).
Source: SSI.
- GINCOME : Nominal consolidated public incomes, (billion TL).
Source: SSI.
- GNP : Nominal gross domestic product, (billion TL).
Source: SSI.
- GNP 87 : Real national product, at producer's prices of 1987, (billion TL).
Source: SSI.
- g : Real national product growth rate, at producer's prices of 1987.
Source: SSI.
- H : Nominal monetary base (or high powered money), (billion TL). For a detailed explanation see Kender

Halicioglu, F. (1998) "Active and Passive Seigniorage Revenues: The Case of Turkey 1970-1997" paper presented at International Conference in Economics II, Economic Research Center, Middle East Technical University, Ankara, Turkey, September 1998.

(billion TL). For a detailed explanation see Keyder (1991) pp.153-159.

Source: CBT.

π : Annual percentage changes in consumer prices index.

Source: SSI.

k : Money multiplier, $k=1/V$.

PSR : Nominal passive seigniorage revenues, (billion TL).

PSRY : Passive nominal seigniorage revenues as percentage of nominal GNP.

PSRTPR : Nominal passive seigniorage revenues as percentage of nominal public revenues which is also inclusive of nominal passive seigniorage.

S : Nominal total seigniorage revenues, (billion TL).

SY : Nominal total seigniorage revenues as percentage of nominal GNP.

SRTPR : Nominal total seigniorage revenues as percentage of nominal public revenues which is also inclusive of nominal total seigniorage revenues.

V : The velocity of monetary base.

REFERENCES

Akcay, C. (1995), "Inflation Tax in a Post-Liberalization Environment: Evidence from Turkey, 1980-1990", in Ç.Balim, *et al.* (eds), Turkey:

Halicioglu, F. (1998) "Active and Passive Seigniorage Revenues: The Case of Turkey 1970-1997" paper presented at International Conference in Economics II, Economic Research Center, Middle East Technical University, Ankara, Turkey, September 1998.

Political, Social and Economic Challenges in the 1990s. E.J. Brill, Leiden.

Auernheimera, L. (1974), "The Honest Government's Guide to the Revenue from the Creation of Money", Journal of Political Economy, 82, 598-606.

Barro, R.J. (1972), "Inflationary Finance and the Welfare Cost of Inflation", Journal of Political Economy, 80, 978-1001.

Bilgili, E. (1997), "Avrupa Bütünleşmesinde Senyoraj Problemi", Maliye Dergisi, (in Turkish), Ankara, No:126, 96-111.

Brennan, G. and Buchanan, J. (1981), "Revenue Implications of Money Creation under Leviathan", American Economic Review, 71, 346-351.

Bruno, M. and Fischer, S. (1990), "Seigniorage Operating Rules and the High Inflation Trap", Quarterly Journal of Economics, 105, 353-374.

Cody, B.J. (1991), "Seigniorage and European Monetary Union", Contemporary Policy Issues, 9, 72-80.

Cukierman, A., Edwards, S. and Tabellini, G. (1992), "Seigniorage and Political Instability", American Economic Review, 83, 537-555.

Ertugrul, A. (1979), "Enflasyon Yolu İle Gelir Saglama ve Türkiye İçin Bir Deneme", Maliye Dergisi, Ankara, (in Turkish) No.41, 86-91.

Fischer, S. (1982), "Seigniorage and the Case for a National Money", Journal of Political Economy, 90, 295-313.

Friedman, M. (1971), "Government Revenue from Inflation", Journal of Political Economy, 79, 846-856.

Keyder, Ç. (1991), Para Teori ve Politika, Türkiye Üzerine Bir Uygulama. 3.Baskı, Bars Lts. Ankara (in Turkish).

Kucuker, C., Kazdagli, H. and Erdemir, C. (1994), Seigniorage in Turkey: Concept and Measurement, Republic of Turkey Prime Ministry - The Undersecretariat of Treasury, Ankara.

Halicioglu, F. (1998) "Active and Passive Seigniorage Revenues: The Case of Turkey 1970-1997" paper presented at International Conference in Economics II, Economic Research Center, Middle East Technical University, Ankara, Turkey, September 1998.

Mankiw, G. (1987), "The Optimal Collection of Seigniorage: Theory and Evidence", Journal of Monetary Economics, 20, 327-341.

Marty, A. (1967), "Growth and Welfare Cost of Inflationary Finance", Journal of Political Economy, 75, 71-76.

Marty, A. (1973), "Growth, Society and The Tax Revenue from Money Creation", Journal of Political Economy, 81, 1136-1152.

Marty, A. (1978), "Inflation, Taxes and the Public Debt", Journal of Money Credit and Banking, 10, 437-452.

Nichols, D.A.(1974), "Some Principles of Inflationary Finance", Journal of Political Economy, 82, 423-430.

Rovelli, R. (1994), "Reserve Requirements, Seigniorage and the Financing of the Government in an Economic and Monetary Union", European Economy, 58, 11-55.

Siegel, J. (1981), "Inflation, Bank Profits and Government Seigniorage", American Economic Review, 71, 352-355.

Spaventa, L.(1989), "Seigniorage: Old and New Policy Issues", European Economic Review, 33, 557-5463.

State Statistics Institute (SSI), Various Statistics.

The Central Bank of Turkey (CBT), Various Statistics.