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**SEIGNIORAGE EARNINGS OF COMMERCIAL BANKS AND STATE BANK OF
PAKISTAN**

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Abstract

The paper reviews the trend of seigniorage earnings by State Bank of Pakistan and commercial banks.

It is found that seigniorage revenue of the SBP has declined overtime which indicates autonomy of the central bank as well as less reliance of the government on SBP's resources for budget financing.

In general, a direct relationship has been observed between seigniorage and inflation in Pakistan.

However, at the two extremes of very high or very low inflation an inverse relation is detected.

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1. Introduction

Historically “seigniorage” has been a levy on metals brought to a mint for coining, to cover the cost of minting and to provide revenue to the ruler who claimed it as a prerogative. With the invention of fiat money, the term is now applied to the real purchasing power achieved by a government through issuing of money. When a government injects money into the economy, it gets command over real resources, given static inflationary expectations. Normally high level of seigniorage is associated with high inflation. However, in a situation when inflationary expectations are building up rapidly, an opposite can very well occur.

A lot of literature, both theoretical and empirical, exists on various aspects of seigniorage and a closely related concept of inflation tax. Keynes (1923) had admitted the efficacy of this form of taxation, up to a point, which the public found hard to evade and even the weakest government could enforce. Bailey (1974), Marty (1976 & 1994), Eckstein & Leiderman (1992) examined the welfare cost of the inflationary finance. Friedman (1971), Brennan & Buchanan (1981), and Mankiw (1987) reviewed the revenue potential of seigniorage under different circumstances. Baltensperger & Jordan (1997) analyzed the distribution of seigniorage between the central bank and the commercial banks. Fischer (1982), on the basis of extensive cross-country analysis, put the loss of seigniorage as a major argument against dollarization whereby a country imports high-power money. While a number of papers attempted to measure and analyze seigniorage in different countries, few analyzed this phenomenon exclusively in the context of Pakistan.

The objective of this paper is to analyze seigniorage in Pakistan. Following the approach of Baltensperger & Jordan (1997), an attempt has been made to split the overall seigniorage into that of central bank and of commercial banks. However, the traditional definition of seigniorage, i.e., the real

value of newly issued money has been used in this paper, instead of B&Js definition that is the opportunity cost of holding real balances. The analysis will give us insight about the scope of seigniorage in Pakistan and its relationship with inflationary pressures. The remainder of the paper is organized as follows: Section 2 gives the methodology used to measure the overall seigniorage and its components. The trend of seigniorage in Pakistan has been reported and analysed in Section 3 along with a cross-country comparison. Section 4 concludes the paper.

2. Measurement of Seigniorage

Seigniorage is measured as the real value of new money issued in a given time period¹, i.e.;

$$S = \frac{\Delta M}{P} \quad (1)$$

Where S = Seigniorage
 ΔM = Change in nominal money balances in a year
 P = Price index

Seigniorage can be decomposed into pure seigniorage and inflation tax as shown below (IMF, 1999);

Let $m \left(= \frac{M}{P} \right)$ is real money balances. Change in real money balances is;

$$\Delta m = \frac{P \bullet \Delta M - M \bullet \Delta P}{P^2} = \frac{\Delta M}{P} - m \bullet \frac{\Delta P}{P} = S - m \bullet \pi \quad (2)$$

where $\pi (= \Delta P/P)$ is inflation.

Equation (2) can be re-arranged as

$$S = \Delta m + m \bullet \pi \quad (3)$$

In equation (3), Δm (change in real money stock) is *pure seigniorage* and " $m \bullet \pi$ " is *inflation tax*.²

¹ Seigniorage can also be defined as opportunity cost of holding money, i.e. private sector's loss of interest revenue from holding non-interest bearing cash balances instead of earning assets.

² In case of discrete data, formula for inflation tax is $(M_{t-1}/P_t) \bullet \pi_t$.

Equation (3) has some interesting implications, e.g. if with the expansion of nominal money, there is no change in real money supply (i.e. $\Delta m = 0$) then seigniorage would be equal to the inflation tax (i.e. $S = m * \pi$) with real money balances as base of the tax and inflation as the rate of the tax. This situation occurs when there is no growth in the real economy, and any increase in nominal money supply is fully reflected in the price increase (Friedman, 1971). On the other hand, even if inflation is zero, seigniorage can still be collected; it will be equal to the change in real money balances, i.e., pure seigniorage.

It may be noted while State Bank of Pakistan earns seigniorage by creating high-power money, commercial banks also earn seigniorage by creating deposits – a form of money.³ Thus the overall seigniorage as defined in (1) can be decomposed into the following two components:

i) State Bank's seigniorage:

$$S_c = \frac{\Delta H}{P} \quad (4)$$

ii) Commercial banks' seigniorage:

$$S_b = \frac{\Delta D(1-r)}{P} \quad (5)$$

Where

ΔH = change in high-power money during a year

ΔD = change in banks' deposits during a year

r = reserve deposit ratio

Equation (5) implies that higher the reserves requirement, lower will be the seigniorage to commercial banks. It is because higher reserves requirement limits the banks' ability to create deposits.

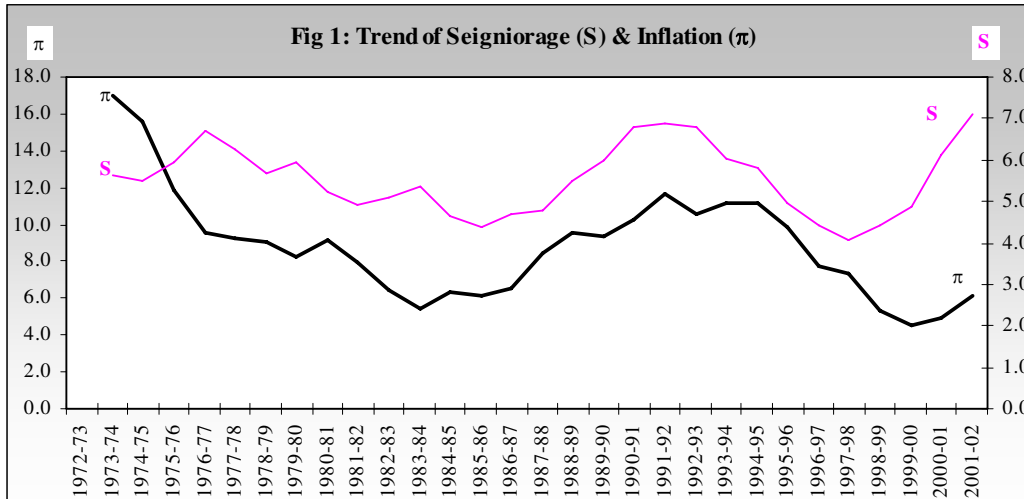
³ The seigniorage earned by the State Bank is collected by the government in the form of Bank's profit going to government's accounts. The commercial banks' seigniorage is distributed among the shareholders of the banks

For calculating overall seigniorage in Pakistan, we have used equation (1), by taking M2 definition of money (as given in the SBP Annual Reports). State Bank's seigniorage has been calculated by employing equation (4). Commercial banks' seigniorage has been worked out by subtracting State Bank's seigniorage from overall seigniorage. GDP deflator has been used to convert nominal money balances and other nominal variables into real. We have also worked out seigniorage and inflation tax in selected developed and developing countries; for cross-country analysis data is taken from International Financial Statistics by IMF.

3. Seigniorage in Pakistan

In Pakistan, the overall real resources generated by issuing money (i.e. seigniorage) have been in the range of 2.1 to 8.8 per cent of GDP since 1972, with an average of 5.7 per cent (**Table 1**). As expected, the overall seigniorage and inflation remained positively co-related during the sample period (1972-05) except in cases of two extremes of very high inflation and very low inflation during the early 1970s and early 2000s respectively (See **Fig 1**). During early 1970s, inflation and seigniorage followed the opposite trend simply because inflation was very high during this period – around 20 per cent – which constrained the ability of the government to generate real resources through printing of money. Thus for policy makers it is important to be prudent while using seigniorage as a source of revenue because excessive money creation fuels inflation, which in turn may defeat any attempt of seigniorage collection. On the other hand, during 2000s, when inflation declined below 5 percent, seigniorage witnessed a rising trend.

and those borrowers who get advances below market interest rates like agriculturalists, exporters and other priority sectors. The loan defaulters are also beneficiaries of commercial banks' seigniorage.



Seigniorage (as % of GDP) is depicted by line SS, and inflation (% change of GDP deflator) is depicted by line $\pi\pi$.

The following features of seigniorage in Pakistan can be observed from the data;

During 1970s, seigniorage was 6 per cent of GDP on average. Relatively high ratio of seigniorage during that period may be due to higher dependence of government on monetary sector's resources.

During this period, commercial banks were earning a seigniorage of 3.7 per cent of GDP. Since all the banks were nationalized in 1970s, a large part of seigniorage earned by them was also accruing to the government.

In the decade of 1980s, total seigniorage was 4.8 per cent of GDP. The share of the State Bank was 2 per cent of GDP and the rest was collected by commercial banks. Compared with 1970s and 90s, seigniorage was lower during 1980s. The decade of 80s was characterised of large inflow of external resources into Pakistan, in the shape of grants, aid and remittances. Such inflows might have precluded, to some extent, the government's exigency of resource generation through printing of money.

In the decade of 1990s, total seigniorage was 5.7 per cent of GDP with only 1.8 per cent accruing to the State Bank and 3.8 per cent to commercial banks. The reduction in the State Bank's seigniorage during nineties may be attributed to the following factors:

- i) The government has reduced its dependence on issuing new money to finance its budget during the period (see table below). Government also borrowed from commercial banks instead of SBP during 1990s. The average borrowing by the government for budgetary support from the State Bank of Pakistan was 20 percent during 1990s as compared with more than 40 percent in 1970s and 1980s.
- ii) There may be some contribution by dollarization of the economy to lower SBP seigniorage. With the introduction of resident foreign currency deposits in 1990-91, dollar deposits increased significantly in Pakistan (around 20 per cent of total monetary assets). On the other hand, holding of real balances in local currency declined due to its substitution with the foreign currency. Thus with the dollarization, the base of the tax declined and people avoided inflation tax.⁴
- iii) The reduction in State Bank's seigniorage can also be viewed in the context of autonomy granted to the Bank in late 1990s. A government has to give up its ability to earn seigniorage, to some extent, by introducing central bank's independence.

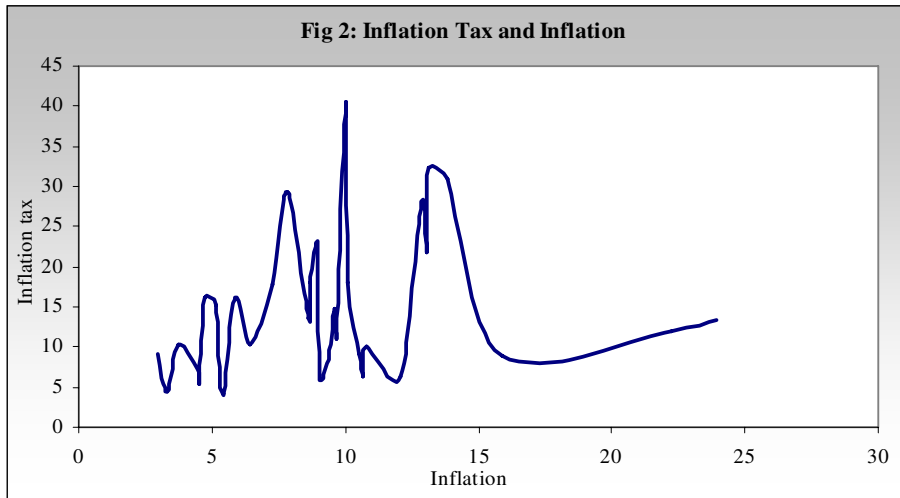
The seigniorage revenue during the current decade of 2000s is more than 7 percent of the GDP with the commercial banks having the major share. The State Bank's seigniorage remained low during this period with some sign of rising trend due to increased government borrowing from the SBP in recent years.

⁴ Although by holding a strong foreign currency (like dollar), inflation tax can be avoided to the extent of inflation differential of domestic and foreign country, pure seigniorage is nonetheless paid to the foreign country.

Table 1: Seigniorage in Pakistan

	In Billion Rupees			As % of GDP		
	Overall All	State Bank	Commercial Banks	Overall All	State Bank	Commercial Banks
1972-73	13.2	4.8	8.4	7.4	2.7	4.7
1973-74	10.0	5.5	4.4	5.3	2.9	2.4
1974-75	4.2	1.4	2.8	2.1	0.7	1.4
1975-76	13.4	4.3	9.1	6.6	2.1	4.4
1976-77	14.3	5.8	8.4	6.7	2.7	4.0
1977-78	15.3	4.5	10.9	6.7	2.0	4.8
1978-79	18.3	8.6	9.7	7.6	3.6	4.0
1979-80	15.3	5.5	9.8	5.9	2.1	3.8
1980-81	12.2	7.0	5.2	4.4	2.5	1.9
1981-82	10.9	3.8	7.0	3.7	1.3	2.4
1982-83	25.6	7.9	17.7	8.1	2.5	5.6
1983-84	13.7	6.2	7.4	4.1	1.9	2.2
1984-85	15.6	4.6	11.0	4.4	1.3	3.1
1985-86	20.0	6.0	14.0	5.3	1.6	3.7
1986-87	20.3	15.4	4.9	5.1	3.8	1.2
1987-88	18.8	5.1	13.7	4.3	1.2	3.2
1988-89	12.4	7.9	4.6	2.7	1.7	1.0
1989-90	28.1	10.4	17.8	5.9	2.2	3.7
1990-91	29.1	14.5	14.6	5.8	2.9	2.9
1991-92	46.7	16.9	29.8	8.7	3.1	5.5
1992-93	36.8	6.5	30.2	6.7	1.2	5.5
1993-94	39.2	12.6	26.6	6.9	2.2	4.7
1994-95	38.7	7.7	30.9	6.4	1.3	5.2
1995-96	33.9	8.1	25.8	5.4	1.3	4.1
1996-97	30.1	9.7	20.4	4.7	1.5	3.2
1997-98	36.9	5.4	31.5	5.7	0.8	4.9
1998-99	16.9	6.5	10.4	2.5	1.0	1.6
1999-00	26.4	21.9	4.5	3.8	3.1	0.6
2000-01	26.2	7.4	18.8	3.7	1.0	2.6
2001-02	47.7	10.4	37.3	6.5	1.4	5.1
2002-03	61.5	16.4	45.0	7.9	2.1	5.8
2003-04	73.2	18.6	54.7	8.8	2.2	6.6
2004-05	78.3	22.2	56.1	8.7	2.5	6.2
Averages:						
1972-80				6.0	2.4	3.7
1980-90				4.8	2.0	2.8
1990-00				5.7	1.8	3.8
2000-05				7.1	1.9	5.3

Like any other tax, inflation tax also follows Lafer curve, that is, high inflation leads to high revenue up to a certain level, and beyond that level revenue begins to decline due to shrinkage of the base (i.e. real money balances). This pattern is observed also in Pakistan. Revenue from inflation tax starts declining when inflation is high (See **Fig 2**).



The inflation tax to GDP ratio remained around 1 percent in Pakistan during the period under analysis. The government was financing 2 to 8 percent of its expenditure (in real terms) by inflation tax while 3 to 14 percent of the total revenue (in real terms) consisted of this form of tax. The decade of 1990s was the period when inflation tax to total revenue was the highest, i.e., 10 percent (**Table 2**). During the current decade, however, share of inflation tax in total government revenues has declined.

Table 2: Inflation Tax

	% of GDP	% of Fiscal Taxes	% of Expenditure
Period Average			
1970s	1.6	8.7	4.6
1980s	1.0	7.1	4.0
1990s	1.3	10.0	5.6
2000s	0.9	6.9	4.3
Overall average			
Max	2.7	14.1	8.3
	(1973-74)	(1990-91)	(1994-95)
Min	0.4	3.2	1.7
	(2001-02)	(1985-86, 2001-02)	(1985-86)

Note: years in parentheses are the years of maximum/minimum value of ratios.

A cross-country analysis of seigniorage during 1970-2000 is given in **Table 3**.⁵ A sample of twelve countries, representatives of various levels of development, has been selected arbitrarily for this purpose. The seigniorage earnings the banking system in India has been 4 to 8 percent of the GDP while central bank's seigniorage has been less than two percent of GDP. On the other hand, in emerging economies like Indonesia, Malaysia, Singapore, Turkey, etc., seigniorage earnings has been very high with an average of about 9 percent of GDP. In developed countries like Australia, UK and US, the average seigniorage earning of the banking system has been around 6 percent of GDP, however, their central banks' seigniorage has been less than one percent and declining over the years. It shows that the governments in these countries do not rely much on printing money for budgetary finances. A low level of central bank's seigniorage may also be an indicator of a central bank's independence.

Table 3: Seigniorage in Different Countries (% of GDP)

	Overall			Central Bank		
	1980s	1990s	2000s	1980s	1990s	2000s
Bangladesh	4.4	3.1	5.1	1.1	0.7	0.8
India	6.1	6.8	8	2.0	1.8	1.4
Sri Lanka	4.3	5.4	5.3	1.5	1.3	0.8
Pakistan	5.0	6.0	6.0	2.1	2.0	1.8
Indonesia	4.8	10.3	5.1	1.0	1.6	1.6
Turkey	5.4	16.2	13.3	1.8	3.1	2.2
Malaysia	6.5	11.1	8.4	1.2	2.0	0.2
Singapore	9.6	11.1	4.1	1.6	1.1	0.1
Australia	5.6	4.8	6.5	0.5	0.3	0.2
UK	10.3	5.5	9.5	0.2	0.1	0.2
USA	5.2	2.7	3.8	0.4	0.5	0.2

4. Concluding Remarks:

Seigniorage in modern economic literature is used for command over real resources generated through issuing new money. Money can be issued both by monetary authorities and commercial banks. Thus both these institutions are able to generate seigniorage. In Pakistan total seigniorage remained around 6 per cent of GDP during the last three decades. In general, a direct relationship has been observed

⁵ Since data for this analysis is retrieved from IFS. Therefore, ratios for Pakistan may not tally with those given in Tables 1 & 2.

between seigniorage and inflation in Pakistan. However, during the era of very high inflation (i.e. early 1970s) seigniorage was low following the Lafer curve. The most notable feature of seigniorage in Pakistan is the decline of the State Bank's seigniorage to 1 per cent by the end of 1990s and then resurgence in recent years (2.5 percent of GDP in 2004-05). There may be three contributory factors to its decline in 1990s: (i) dollarization of the economy which started in early nineties, (ii) abatement of the government's reliance on printing money to finance its budget deficit, and (iii) autonomy of the State Bank. However, the resurgence of the State Bank's seigniorage in the recent decade of 2000s may be due to reversal of dollarization as an aftermath of freezing of foreign currency accounts in 1998 and excessive borrowing by the government from the State Bank during this period.

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