Monetary Base and Seigniorage in a Digital Era

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ABSTRACT: Rapid technological innovation in payments systems—both public and private— portends a declining demand for money (especially monetary base, or M0). We comprehensively look at the relationship between monetary base and seigniorage and related variables for all countries, unless there were data issues. Our analytical work supports the hypothesis that monetary base will be an important variable in standard central bank balance sheets (CBBS) to gauge forthcoming seigniorage revenue. We conclude that emerging markets (EMs) and low-income countries (LICs) countries may have to lower expectations of seigniorage revenue in the near future as CiC (currency in circulation) may decline in a digital era.

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Introduction

Seigniorage is (and has always been) an integral component of the central bank balance sheet in emerging markets (EMs) and low-income countries (LICs).[1] Seigniorage accrues to a central bank when it trades its monetary asset for non-monetary assets (for example, Treasury bonds), and profits from the difference between the interest on the bonds and what it pays (close to zero) on the monetary asset. Seigniorage is both a flow (annual profits), and a stock (the cumulative monetary asset or cash, printed).

Traditionally, a central bank's seigniorage has been a primary source of income. Past literature straddles on fiscal considerations for money creation (Sargent 1982; Mankiw, 1987a) and inflation tax-related economics (Sargent and Wallace,1981; Calvo and Leiderman, 1992; Eckstein and Leiderman, 1992; Kiguel and Neumeyer, 1995; Easterly et al. 1995; Fischer et al, 2002; Buiter, 2007; Chakraborty, 2018 etc.). Almost all research starting in early 1980s focused on the high inflation era of the 1980s and 1990s, where the primary focus was seigniorage via high inflation and maximizing the Laffer curve.[2] In very recent years, the focus on "inflation contribution to seigniorage" continues: Aziz and Pereira (2022), find that with high inflation in 2021 and 2022, seigniorage in EMs (at 2.5 percent of GDP) helped fiscal authorities, but with inflation slowing, these revenues would fall to half their levels.

Our paper does not delve into the "asset side of central bank balance sheet" (via investment income on assets); this entails hand-picking data for 93 countries over 10 years (Veyrune and Zerbo, 2023). More importantly there are several quasi-fiscal adjustments that differ from country to country; investment income is not comparable between country i and country j and would not be seigniorage in the classical sense. Central bank balance sheet (CBBS) assets are a function of several factors in EMs and LICs, including currency pegs; whether they are pure floaters or not; the size of international reserves, and claims of central bank on public sector and financial institutions, etc. (Polanski and Szadkowski, 2021).

This paper shifts gears and focuses on forthcoming changes in reserve money (M0 or monetary base), not inflation. Walsh (2011), in his textbook, argues that "*inflation tax is normally the focus of analyses of seigniorage because it can be nonzero even in the steady state*"; changes in reserve money that the private sector is willing to hold in steady state can be assumed to be zero (as it would willingly not give government free resources). We show that reserve money changes are not zero empirically and thus pursue this route. In particular, within the traditional M0 (and not M1 and M2), we focus on the two components, CiC (currency-in-circulation) and required reserves (RR). Our hypothesis is that demand for M0 will change in the digital era.

Very recent research shows a decline in cash in general (Khianorong, Humphrey (2022a)[3]; BIS, 2023, CPMI Brief No 1); but their sample comprises about 27 advanced economies only. Another recent theme

[1] Advanced economies (AEs) may not factor seigniorage's importance in their monetary policy (typically freely floating currency); however, some (recently) do acknowledge the role that digital era will bring on seigniorage (e.g., Bank of England, Sveriges Riksbank/ Sweden, etc.)

[2] The high (or remarkably high) inflation era required the use of log (inflation) in such regressions. Some regressions also assumed that the semi-elasticity of money-demand was not constant, and increases with increasing inflation (i.e., high inflation causes a flight from money towards other alternative assets and stronger currencies).

[3] Only 27 countries report on the CPMI/ BIS Red Book Statistics, including Argentina, Belgium, Brazil, Canada, China, Euro Area, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, South Korea, Mexico, Netherlands,

that is integral for understanding changes in base money and seigniorage is transactional velocity of money and the likely increase in this metric in the forthcoming digital era (Omarova, 2020; Adrian and Mancini-Griffoli, 2021;and Stella 2023).

Our paper initially considers all 190 IMF-member countries and shows the relationship between M0 and seigniorage. We explain why this relationship is relevant especially if (i) inflation was low in the past two decades (2000-2019) and (ii) given the embrace of digital money that may lead to lower demand for money stemming from the higher velocity of digital money (Section I). We show the role of the monetary base within a traditional CBBS and the link to seigniorage in Section II. In Section III, we discuss the analytics after controlling for inflation that supports our hypothesis that M0 is a key variable in a standard CBBS to gauge seigniorage revenue. We conclude that emerging markets (EMs) and low-income countries (LICs) may have to lower expectations from seigniorage revenue in the near future as the M0 trend may decline in the digital era.

I. Transactional Velocity of Money in a Digital Era

In a recent paper Some Alternative Monetary Facts, Stella, Singh, and Bhargava, 2021 (henceforth Stella et al. (2021) argue that "rapid technological innovation in payments systems—both public and private—portends a declining demand for money (especially reserve money or M0). M0 is the key monetarist variable as it is notionally controlled by the central bank and thus exogenous to the central bank.[4] Its importance may be judged by the various evocative names given to it by monetarists; another name is "base money"—the sum of bank deposits at the central bank (or required reserves) and CiC." [5]

CiC is (and has been) the bulk of M0 in modern monetary and money metric tabulations. Bindseil (2018) underlines the importance of CiC when explaining the merits of lean central bank balance sheets in his Jackson Hole (2016) address:

- "*[An] outstandingly lean central bank balance sheet was the one of the Fed pre-crises, where the total balance sheet length was only around 1.1 times the total amount of banknotes in circulation. [ ] ...the idea that the central bank permanently injects monetary accommodation through a longer balance sheet with substantial holdings of a portfolio of less liquid assets with long maturity and possibly some credit riskiness does not appear sufficiently convincing."*

Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. Most EMs and LICs are not part of this sample.

[4] Exogenous (or available on demand) is a key attribute of CiC, along with privacy and non-interest bearing. Any deviation from these attributes would result in an instrument that is variant of CiC. A recent Reserve Bank of India speech makes this subtle point: [digital money like] is the same as currency issued by a central bank but takes a different form than paper (or polymer). It is sovereign currency in an electronic form, and it would appear as liability (currency in circulation) on a central bank's balance sheet. However, digital money (e.g., CBDC) that pays interest or has caps, will be unlike CiC.

[5] "In circulation" means in the hands of the public, i.e., having been paid out and duly recorded by the central bank. It thus includes notes in mattresses, buried underground or destroyed as well as those being used. The total in circulation is, of course, reduced when the central bank destroys unfit notes.

Appendix 1 shows M0/GDP of many countries used in our sample. Interestingly, most EMs and LICs have a M0/GDP ratio that can range from 10% to well over 100%.

Stella, Singh, and Bhargava (2021) suggest that Fisher's QTM (Quantitative Theory of Money) describes a relationship between money and payments or transactions (not national income); the T in MV=PT represents actual transactions, which is proxied by the national income or GDP.[6] As digitalization has led to the evolution of modern payments system, from credit cards to e-money, crypto assets, and potentially in future central bank digital currencies (CBDCs), the gap between the proxy and the actual number of transactions in the economy has been widening. A recent country study (via an official technical assistance mission) finds that volume using e-wallets for payment of goods and services (end-2018) was 4.3 billion local currency units, and the average (2018) e-wallet holdings were about 265 million local currency units (end-2018). This results in a "*transactions velocity*" of about 16.[7] This provides a useful lens that suggests a higher transactional velocity of digital money may entail lower demand for money. Singh and Kahn (2023) highlight that the top three stablecoins have exhibited "on-chain" (or verifiable) velocities of 80-100. The concept of velocity (from the transactional lens) will change with digital money; and this paper highlights this forthcoming issue.

II. Monetary Base and Seigniorage

Aside from a few countries, CiC is the key driver of M0.[8] A recent report by ICICI, one of the largest banks in India, suggests that "the share of currency in circulation to GDP is expected to be stable or reduce in coming years because of digital payments boost. "[9] Another example is Kenya, where after the adoption of M-Pesa in 2007, CiC/GDP has declined by half, as the digital M-pesa has led the money multiplier (Broad money to M0) to move from below 5 to above 10. Seigniorage, unsurprisingly, declines if you ignore the recent inflation/COVID era. See Figures 1a, 1b, and 1c.

[6] PT (or GDP) will not increase due to speed of money but there may be an increase due to financial inclusion and better accounting of the shadow economy' similarly unaccounted M (on left side of the equation) increases. However, unless digital money is involved that is likely to increase V (velocity), then M maybe lower.

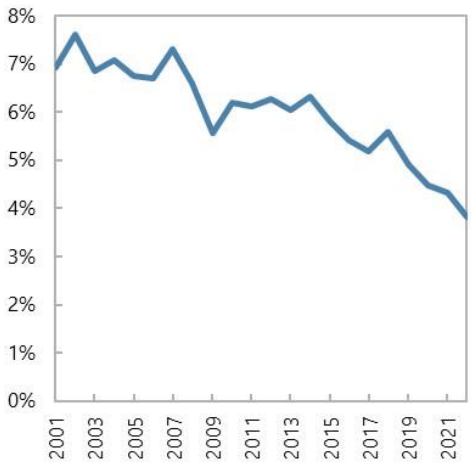
[7] The comparison, GDP/M0, a standard metric and is roughly 2.0 or 3.0 as per monetary files of this country (and most other countries monetary files). FRED, a database from St. Louis Fed also shows similar numbers.

[8] The trend of M0 may not decline due to financial deepening, e.g., Russia, Mongolia, Armenia, Cambodia, and Rwanda (larger banking sector; thus, more required reserves contribute to M0; thus, M0 may not decrease even if CiC decreases).

[9] Changes in M1 and M2 (to the private sector, perhaps as a public good) may also lead to decline in CiC; however, our focus is on central bank seigniorage; hence, primary changes in M0 are relevant.

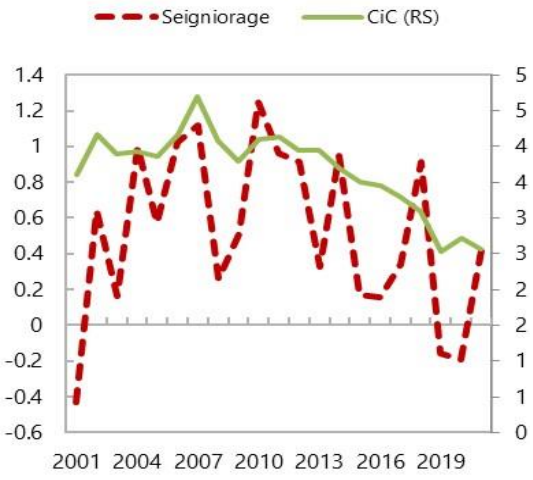
Figure 1. Kenya: Base Money, Seigniorage and Currency in Circulation Statistics (2007–2023)

1a. Kenya's Base Money/GDP has declined



International Financial Statistics and authors calculations

1b. Kenya's CiC/GDP and Seigniorage have declined



International Financial Statistics and authors calculations

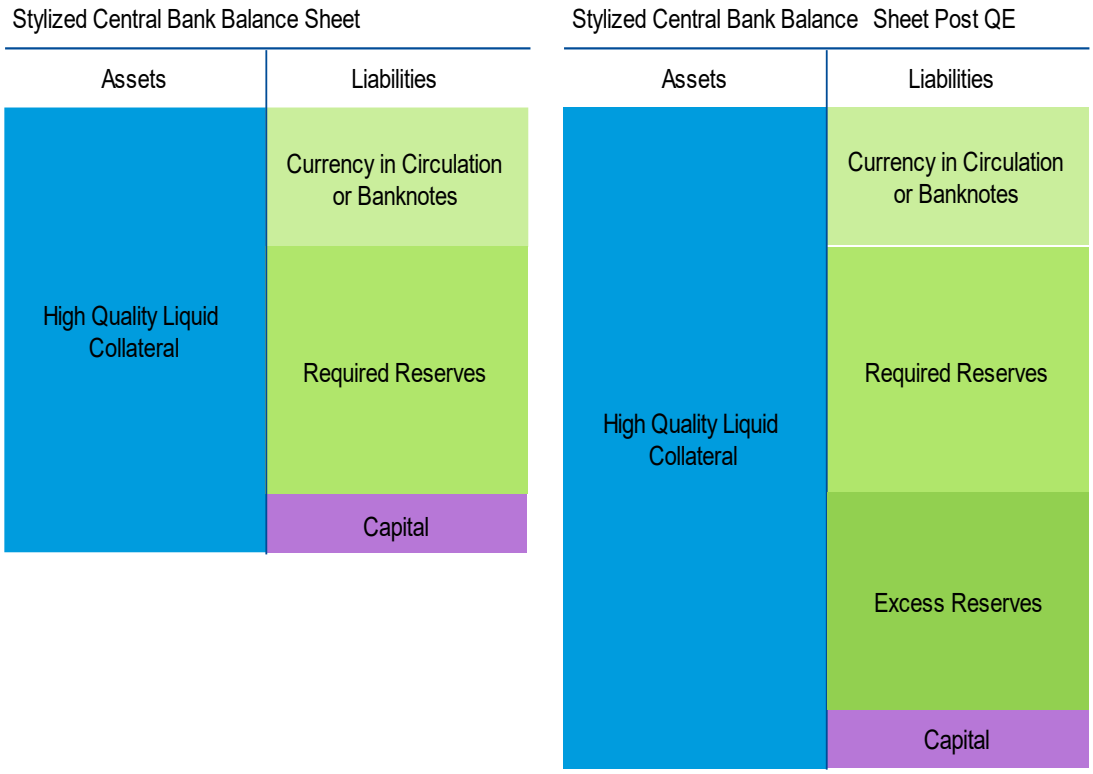
1c. Kenya's Money Multiplier (Broad Money/Monetary Base) has more than doubled.



In virtually no country does the central bank ration, i.e., control the supply of banknotes, so that currency is determined by market demand and cannot be set by the central bank [10] (Figure 1, left panel). Only in the post-Lehman era did we see sizable excess reserves (from near zero) that have even surpassed CiC in some countries (e.g., the USA), largely due to QE and later COVID-19 era spending (Figure 2, right panel).

For those who prefer to disentangle inflation taxes from "pure" base money related seigniorage, Box 1 shows the breakdown between the two. Indeed, in some (very recent) cases inflation has kept seigniorage positive as the base money change was negative.[11]

Figure 2. Central Bank Balance Sheet
(with and without excess reserves)



Source: IMF staff estimates.

[10] The Fed's decision in March 2020 to set the required reserve ratio at zero is perhaps the last nail in the coffin for the notion that AE country central banks use reserve requirements in conjunction with changes in other reserves to control money, credit, or any other variable.

[11] Another route to increase seigniorage is to reduce the printing cost. For example, India's foray into digital money, in part, is to reduce the 5,000 crore rupees (over $600 million) spent to produce paper currency and coins.

In our paper we use the standard definition that is used in economic circles that shows that changes in *base money* and *inflation* contribute towards seigniorage, as reflected in equation 1 below.

$$\textbf{Seigniorage}_t \equiv \frac{(H_t - H_{t-1})}{P_t\, Y_t} = (h_t - h_{t-1}) + \left(\frac{\pi_t}{1+\pi_t}\right) h_{t-1} \quad (1)$$

Change in M0/GDP

Inflation

Where:

$H_t - H_{t-1}$: Change in Reserve Money

$P_t Y_t$: Nominal GDP

$h_t = \frac{H_t}{Y_t\, P_t}$: Reserve Money as percentage of GDP

To be complete, real GDP (g_t) is also part of the second term and, hence, is included in our calculation of the seigniorage metric:

$$Seigniorage_t = \frac{H_t - H_{t-1}}{P_t Y_t} = \frac{H_t}{P_t Y_t} - \frac{H_{t-1}}{P_t Y_t} = h_t - \frac{H_{t-1}}{(1+\pi_t)(1+g_t)P_{t-1}Y_{t-1}} = h_t - \frac{h_{t-1}}{(1+\pi_t)(1+g_t)}$$
$$= h_t - h_{t-1} + h_{t-1} - \frac{h_{t-1}}{(1+\pi_t)(1+g_t)} = h_t - h_{t-1} + \frac{((1+\pi_t)(1+g_t)-1)h_{t-1}}{(1+\pi_t)(1+g_t)}$$

We attempt to focus on two forthcoming trends: First, that global inflation has declined since the peak in 2022/23, and second, that CiC may be adversely impacted by the digital era (via the higher transactional velocity of digital money); both trends impact seigniorage adversely.[12] Our analytics incorporate the standard formula (above) since inflation is contributes to seigniorage (see Box 1 for some examples).

[12] To be complete, the value added of digital money may lie in the ability to establish a platform that enables modern technologies to do things that cannot be easily done in traditional systems. The distribution model and accounting of M0 or M1 or M2 could look the same (or different, but the platforms may offer alternatives).

III. Data and Analytics

Data

Inflation and nominal GDP are from the IMF's World Economic Outlook (WEO), while CiC, RR, and M0 data are from the IMF's International Financial Statistics (IFS). We start with all 190 IMF member countries. However, after examining the data we end with a panel of 106 countries. We remove 35 countries due to data unavailability/inconsistency and 7 outliers (5 for inflation and 2 for seigniorage).[13] Furthermore, the post-Lehman era resulted in large central bank balance sheets due to quantitative easing (QE) programs and COVID-19 related spending by central banks.

The literature regarding the asset side of central bank balance sheet (e.g., interest income) is not available for all 190 countries and the closest metric would be "addition to equity," which is after fiscal transfers and other line items which vary across countries significantly. Data collected by hand is doable but not comparable, although some scholars take this route. Moreover, our focus is on the forthcoming role of the digital era, where demand for fiat money (e.g., CiC) is likely to decline (after controlling for inflation, as we have shown in Figure 1 (Kenya's statistic); India and Brazil may also be in this group in due course—and all this is without considering the CBDC route.

As a result, as shown in Figure 2, right panel, excess reserves dominate (and are even larger than CiC in some cases) the liability side of CBBS, and thus are at odds with the basic seigniorage and CiC metric that is the focus of this paper. We thus remove the United States, Euro-area countries, the United Kingdom, Japan, Switzerland (where the Swiss National Bank balance sheet expanded due to the Eurozone crisis in 2011-12) and Iceland (due to their 2007/08 crisis) from our sample. We also remove the 8 West African Economic and Monetary Union (WAEMU) nations namely Benin, Burkina Faso, Côte D'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo as they use "special arrangements" to allocate seigniorage to individual central banks. Similarly, countries that use US dollar or Euro as official currency (and have no local currency) do not generate seigniorage (Ecuador, El Salvador, Marshall Islands, Micronesia, Palau, Panama, Timore-Leste, Andorra, Kosovo, San Marino, Montenegro); thus removed.

Data from 2020 to 2022 is available but out of kilter with the trend exhibited until 2019; the COVID-19 period resulted in: (i) a sharp contraction of GDP across the sample (thus affecting the base money/GDP component in equation 1); and (ii) an increase in the need to hold physical cash (or CiC, which is part of M0 in equation 1). The post-COVID era (i.e., 2023 and onwards) will likely result in lower inflation and may also, depending on the digital embrace of the country, lead to lower CiC.

[13] Inflation outliers are countries with greater than 100 percent inflation in at least 2 years. These include Angola, the Democratic Republic of Congo, South Sudan, Sudan, and Venezuela. Seigniorage outliers (extreme high values) were also excluded, e.g., Liberia. Additionally, the list of 35 countries removed due to data unavailability/inconsistency is available upon request.

Box 1. Seigniorage Components—Base Money Change and Inflation

A few illustrative cases show the breakdown from the contribution to seigniorage from base money change and inflation. We use the formulation described in the text and highlight that high inflation in recent years has kept seigniorage positive. Change in base money has been negative in recent years (we note that COVID era was an aberration)

Albania

	2018	2019	2020	2021	2022f
Reserve Money (b. of lek)	423.4	434.0	534.3	565.2	585.4
Nominal GDP (b. of lek)	1636.7	1691.9	1644.1	1889.8	2078.2
Reserve Money/GDP	25.9%	25.6%	32.5%	29.9%	28.2%
CPI eop (yoy %)	1.8%	1.1%	1.1%	3.7%	9.0%
Change in Reserve Money/GDP		-0.2%	6.9%	-2.6%	-1.7%
Real GDP	4	2.1	-3.5	8.5	3.7
Seigniorage		0.6%	6.2%	1.0%	1.7%

Kyrgyz Republic

	2018	2019	2020	2021	2022f
Reserve Money (KGS, mln)	106,347	118,065	147,338	156,908	227,381
Nominal GDP (KGS, mln)	569,386	619,103	601,820	739,819	919,445
Reserve Money/GDP	18.7%	19.1%	24.5%	21.2%	24.7%
CPI eop (yoy %)	0.5%	3.1%	9.7%	11.2%	14.7%
Change in Reserve Money/GDP		0.4%	5.4%	-3.3%	3.5%
Real GDP	3.5	4.6	-8.6	3.7	7.0
Seigniorage		1.7%	5.5%	0.0%	7.4%

Mongolia

	2018	2019	2020	2021	2022
Reserve Money (b. of togrog)	4907.8	5172.3	4516.0	4807.8	6726.8
Nominal GDP (b. of togrog)	32582.6	37839.2	37453.3	43018.6	52867.4
Reserve Money/GDP	15.1%	13.7%	12.1%	11.2%	12.7%
CPI eop (yoy %)	8.1%	5.2%	2.3%	13.8%	13.2%
Change in Reserve Money/GDP		-1.4%	-1.6%	-0.9%	1.5%
Real GDP	7.7	5.6	-4.6	4.5	7.0
Seigniorage		0.1%	-1.9%	1.0%	3.5%

Analytics

We use an instrumental variable model with year and country fixed effects to estimate the effect of changes in M0 on seigniorage. We normalize the variables with nominal GDP to make the variables stationary, $M0_{i,t}$, and further control for inflation.

To eliminate the endogeneity issue, which might be caused by a high correlation between M0 and seigniorage, we use required reserves as an instrumental variable.[14] Since by definition, required reserves is one of the components of M0, any direct/indirect change in required reserves will impact M0. Furthermore, the only way required reserves can influence seigniorage is through M0, thereby satisfying the exclusion restriction. The first stage is shown in equation (2), and its estimated results are shown in first column of Table 1 below:

$$\widehat{M0_{i,t}} = \delta_0 + \delta_1 RR_{i,t} + \gamma_i + \theta_t + u_{i,t} \quad (2)$$

Where $\widehat{M0_{i,t}}$ is the estimated $M0_{i,t}$ and $RR_{i,t}$ is the required reserves normalized by nominal GDP. The results from equation (2) confirm that M0 has a strong positive correlation with required reserves.

We use annual fixed weights commodity terms of trade index lagged by one year (Gruss and Kebhaj, 2019; Furceri et al., 2016), $CTOT_{i,t-1}$, as a proxy for inflation to avoid identification problems. Commodity terms of trade index captures the inflationary impact through exchange rate and import/export prices. The second stage equation is shown as equation (3) and the estimated results are in the second column of Table 1. We find estimated M0 after controlling for inflation remains significant at 1 percent in explaining seigniorage.

$$Seigniorage_{i,t} = \beta_0 + \beta_1 \widehat{M0_{i,t}} + \beta_2 CTOT_{i,t-1} + \gamma_i + \theta_t + \varepsilon_{i,t} \quad (3)$$

[14] Does RR contribute to seigniorage? Many countries do not fully reimburse RR (95 from 128 countries in our database). When countries reimburse RR, the reimbursement on RR may be higher or lower than earnings from RR. If the reimbursement to RR is low, it benefits seigniorage when the money from RR is used to purchase local currency bonds. This is because the interest payments (coupons) from these bonds are likely higher than the amount reimbursed for the required reserves. Conversely, if the reimbursement to RR is higher, this is detrimental to seigniorage when RR is used to buy, for example, US Treasuries on the asset side. In this case, the interest payments from US Treasury coupons may be lower than the reimbursement on RR.

Table 1. Results for Equations (2) and (3)

	First Stage	IV
	M0	**Seigniorage**
M0		.304***
		(.026)
RR	1.01***	
	(0.02)	
L.CTOT	2.32	3.20***
	(2.13)	(1.12)
Constant	5.041**	-5.161***
	(2.079)	(1.172)
Year FE	Yes	Yes
Country FE	Yes	Yes
Observations	1860	1846
No. of Countries	106	106
Adj R^2	.855	

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Conclusion

Our research suggests that going forward, after controlling for inflation, countries embracing digital money may notice a declining demand for M0; this may warrant close attention to seigniorage revenues. This theme may not resonate as much with advanced economies (AEs), in part due to their excess reserves resulting from quantitative easing (QE) that may be at par (and have been even multiples of required reserves), and the associated interest on excess reserves that subtract from seigniorage. However, seigniorage remains an integral line item for central banks in EMs and LICs serving as bridge to their relationship with their treasury or ministry of finance. Additionally, past research on seigniorage has focused primarily on inflation (and inflation tax), and not on monetary base changes.

Continued research in this area is warranted and welcome (with 2023 data onwards) given the aberatrion in using data from the COVID-19 period (2020-2022), as discussed in this paper.

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Appendix: M0/CBBS

Country	M0/CBBS
Albania - 914	82.3%
Algeria - 612	55.8%
Angola - 614	24.9%
Anguilla - 312	61.6%
Antigua and Barbuda - 311	86.2%
Argentina – 213	22%
Armenia - 911	65.5%
Azerbaijan – 912	66.7%
Bangladesh – 513	61.8%
Belize – 339	79.9%
Benin – 638	46.3%
Bosnia and Herzegovina – 963	88.4%
Botswana – 616	11.9%
Brazil – 223	26.7%
Bulgaria - 918	69.9%
Burkina Faso – 748	54.7%
Burundi - 618	43.1%
Cabo Verde – 624	74.7%
Cambodia – 522	66.4%
Chile – 228	21.4%
Hong Kong - 532	47.2%
Macao - 546	21.9%
Colombia - 233	50.2%
Comoros - 632	61.9%
Costa Rica - 238	118.9%
Cote d'Ivoire - 662	54.2%
Czech Republic - 935	101.2%
Denmark - 128	41.4%
Dominica - 321	88.3%
Dominican Republic - 243	36.7%
Eastern Caribbean Currency Union (ECCU) – 309	77.6%
Eswatini - 734	24.1%
Fiji – 819	80.9%
The Gambia – 648	38.8%
Georgia - 915	59.2%
Ghana - 652	53.0%
Grenada - 328	87.0%
Guatemala – 258	64.8%
Guinea-Bissau – 654	75.3%
Guyana - 336	69.2%
Honduras – 268	69.0%
Hungary - 944	65.2%
Iceland - 176	14.1%
Indonesia – 536	40.4%
Iraq - 433	72.4%
Israel - 436	35.6%
Jamaica - 343	36.9%
Kazakhstan – 916	49.9%
Korea - 542	51.0%
Kuwait - 443	62.6%
Lesotho - 666	17.1%
Libya - 672	16.9%
Madagascar – 674	45.6%
Malawi - 676	13.2%
Malaysia - 548	32.6%
Maldives - 556	50.7%
Mali - 678	54.4%
Mauritius - 684	37.8%
Mexico - 273	71.3%
Moldova - 921	74.2%
Mongolia -948	31.4%
Montserrat – 351	82.9%
Morocco - 686	85.2%
Mozambique – 688	67.0%
Namibia - 728	15.7%
Nepal - 558	48.1%
New Zealand - 196	55.6%
Niger - 692	49.3%
North Macedonia – 962	55.2%
Norway - 142	16.9%
Oman – 449	44.5%
Pakistan - 564	48.1%
Paraguay – 288	48.4%
Poland - 964	46.6%
Qatar – 453	30.6%
Romania - 968	44.8%
Rwanda - 714	30.0%
Samoa - 862	53.0%
Senegal - 722	57.1%
Serbia - 942	42.7%
Seychelles – 718	52.2%
South Africa – 199	29.1%
St. Kitts and Nevis - 361	87.6%
St. Vincent and the Grenadines – 364	83.6%
Suriname – 366	44.4%
Thailand - 578	26.8%
The Bahamas – 313	77.1%
Togo - 742	27.2%
Trinidad and Tobago - 369	22.7%
Tunisia - 744	62.0%
Turkey - 186	77.4%
Ukraine - 926	38.4%
Uruguay - 298	14.8%
Uzbekistan – 927	16.0%
Vanuatu - 846	50.0%
WAEMU - 759	51.4%
Zambia – 754	42.3%

Source: IMF statistics, 2024. Updated where possible.