

# Economic Sustainability of Basic Income Under a Citizen-centered Monetary Regime

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## Abstract

This paper outlines the historical transformation from “administration-centered monetary regimes” to “bank-centered monetary regimes.” It reveals three defects in the latter: (1) difficulty overcoming recessions, (2) a tendency to create bubbles, and (3) opaque distribution of seigniorage. This study proposes a “citizen-centered monetary regime” and confirms that providing citizens a basic income financed by seigniorage is sustainable under the citizen-centered regime.

## 1 Introduction

A basic income has two components: a “social security” component that guarantees a minimum standard of living and a “citizen or national dividend” (Douglas, 1924) representing a distribution of public earnings. Although the former is important as a matter of normative economics, this study focuses on the latter.

A simple example of a citizen dividend is the distribution of benefits from resources, such as Iran’s targeted subsidies plan and the Alaska Permanent Fund financed by petroleum. However, even citizens of resource-poor countries such as Japan can receive a citizen dividend because Japan has public earnings from seigniorage, which originates from producing cash and coin. For example, the cost of producing a 100,000 yen note is 20 yen, the remaining 99,800 yen is seigniorage.

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We should increase the supply of money in proportion to economic growth; otherwise, the economy will plunge into deflationary recession. Because annual GDP growth ranges from 1% to 3% in developed economies, we should create money as a function of these percentages. To the extent the existence of economic growth enables economies obtain seigniorage.

In fact and practice, seigniorage is distributed unfairly and opaquely because most money is created by commercial banks. Money in circulation (money stock) consists of notes issued by central banks and deposits created by commercial banks. The quantity of the latter far exceeds the former in all major countries. Therefore, a portion of seigniorage is given to commercial banks as a hidden subsidy (Huber and Robertson, 2000). Another portion is probably received by households and firms as interest on deposits. It is not entirely evident that people who have no deposits reap this benefit, but it seems reasonable to conclude that not all citizens obtain seigniorage and its distribution is inequitable and vague.

The distorted distribution of seigniorage originates from the distortions inherent in a bank-centered monetary regime, in which commercial banks create money and decide how seigniorage is used. I define “monetary regime” as the body of structures and institutions surrounding money. The present monetary regime under which we live consists of a note-issuing monopoly, fractional reserve banking, and managed currency. However, we are barely conscious of the oddity of the regime because it seems to exist as a given in the natural environment. Even so, monetary regimes are manmade and can be re-created, as they have been in the past and will be in the future.

This paper proceeds as follows. First, it outlines the history of monetary regimes to set the present regime in perspective. Second, it discusses defects in the present bank-centered monetary regime. Finally, it proposes a citizen-centered monetary regime to correct those defects and confirms that a basic income financed by seigniorage is sustainable under that new monetary regime.

## 2 Historical Transformation of Monetary Regimes

### The Classification of Monetary Regime

Monetary regimes can be roughly divided into two types: an administration-centered monetary regime (A-regime) and a bank-centered monetary regime (B-regime). Under an A-regime characteristic of the pre-modern age, an administration (government) issues metal money or notes (paper money), which may be convertible or inconvertible. Under a B-regime characteristic of the modern age, banks issue notes and create deposits. The notes may be convertible under a gold, silver, or bimetallic standard or inconvertible (managed currency). Issuance of notes is centralized under a note-issuing monopoly or decentralized as under a free banking system. Deposits might or might not be subject to fractional reserve requirements. The present monetary regime is a B-regime featuring a managed currency, note-issuing monopoly, and fractional reserve banking.

### Administration-centered Monetary Regime

Before the modern age, sovereign rulers minted and circulated coins. Because the supply of metals (commonly gold, silver, or copper) contained in the coins was limited, rulers had difficulty increasing the quantity of money appropriately. If the quantity of money declines or does not increase as a function of economic growth, money in circulation will run short. Scarcity of money curbs economic growth and causes recessions.

Pre-modern economies experienced long-run scarcities of money. A scarcity of silver throughout Islam in the 10th century, a scarcity of copper coins during the Song Dynasty in China, and the “great bullion famine” are historical examples of serious money scarcities. Scarcity of money during the medieval era had various causes: depletion of silver mines, hoarding of precious metals, scraping metal off coins, trade deficits with the East<sup>1</sup> and economic growth, which can boost demand for money. It is difficult for an economy to grow fast without notes, which can be abundantly issued.

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<sup>1</sup>Medieval Europe imported various goods e.g., luxuries, spices, silks, and alum from Islam, India, and China, but it exported few goods, notably slaves. Therefore, precious metals flowed to the East. Although exports of wool from Flanders reduced the deficit slightly, Europe did not return to breakeven until the Industrial Revolution

Pre-modern economies found two solutions for the scarcity of money: recoinage and issuance of government notes. Recoinage involves governments decreasing the quantity of metal contained in coins, enabling it to mint more coins. In medieval Europe and Japan's Edo period, governments implemented recoinage to stimulate their economies or gain seigniorage. If seigniorage from recoinage is used to finance government expenditures and the quantity of coins in circulation increases, inflation results. However, hyperinflation had never occurred and deflation tended to occur because it was difficult to frequently recoin metallic money. An A-regime featuring metallic money is more likely to be a deflationary rather than inflationary.

Government notes had been issued in China and were in extensive circulation during the Song Dynasty. China's economy had run short of copper coins because of rapid economic development at that time. Although government-issued paper money (Jiaozi)<sup>2</sup> offset the scarcity, the over issuance of notes caused hyperinflation in the final days of the Southern Song, as was also the case during the final days of the Yuan Dynasty, which over issued its paper money (Chao).

Although both bronze coins and paper money (Da Ming Tong Xing Bao) were circulated during the early Ming Dynasty, silver money became dominant following the silver boom in Iwami in Japan and Potosi in Peru. Thereafter, paper money was still paid to soldiers, but its value continued to decline. The succeeding Qing Dynasty did not issue paper money and adopted the silver standard.

Other attempts to circulate government notes similarly failed. Paper money is effective in compensating for scarcity of metallic money. However, if seigniorage from paper money is used to finance government expenditures, its over issuance would cause hyperinflation and economic collapse. An A-regime featuring paper money is an inflationary regime.

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<sup>2</sup>Iron coins were used in areas such as the Sichuan Province where copper was scarce. Because iron coins were too heavy to convey, merchants deposited them in associations and received receipts. Paper money (Jiaozi) originated from the receipts.

## Establishment of a Bank-centered Monetary Regime

Except for demand notes<sup>3</sup> and assignats<sup>4</sup>, government notes have not been issued in the West. Modern paper money originates not from government notes but from bank notes. In 17th century England, goldsmiths stored gold for merchants to whom they gave deposit receipts. Thereafter, the receipt (a “goldsmith note”) began to circulate as money and evolved into bank notes. While the Bank of England, founded in 1694, lent primarily to the government, it issued banknotes in imitation of goldsmiths, helping to resolve the scarcity of money in England. Many commercial banks came to hold Bank of England notes as reserves in place of gold and deposited them in the Bank of England; a fractional reserve system evolved naturally. The Coinage Act of 1816 introduced the gold standard, and the Bank of England began to monopolize issuance of bank notes under the Bank Charter Act of 1844. Government’s monopoly on issuing notes was institutionalized.

A B-regime was established in 18th century England. Major countries, including France<sup>5</sup> Germany<sup>6</sup> Japan<sup>7</sup> and the United States<sup>8</sup> adopted the regime to develop stable capitalism. B-regimes are better suited to progressive economies like capitalism. They cause less deflation than A-regimes featuring metallic money because money can increase without limit by issuing notes and creating deposits. In addition, B-regimes cause less inflation than A-regimes featuring paper money because government cannot directly use seigniorage under a B-regime. B-regimes provisionally overcome shortcomings of A-regimes featuring metallic or paper money. However, the gold standard tends to instigate deflation, what Eichengreen (1992) called “golden fetters.” Thus, most countries abandoned the gold standard and adopted managed currencies during the Great Depression

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<sup>3</sup>Demand notes were issued during the Civil War in the United States.

<sup>4</sup>Assignats were issued in France during the French Revolution.

<sup>5</sup>John Law established Banque Generale to administer royal property in 1716 in France. The government acquired the bank and renamed it Banque Royale in 1718. However, Banque Royale over issued paper money and caused hyperinflation, and Law’s plan failed in 1720. Hereafter, Banque de France, established by Napoleon Bonaparte in 1810, gradually became France’s de facto central bank and began to monopolize note issuance in 1848.

<sup>6</sup>The German Reichsbank was established in 1876 and given the authority to issue notes. However, banks in Baden, Bavaria, Saxony, and Wurttemberg issued notes in parallel until the 1920s.

<sup>7</sup>The Bank of Japan was established in 1882.

<sup>8</sup>The Federal Reserve System was established in 1913.

of the 1930's. Thereafter, major countries achieved high economic growth with galloping or creeping inflation under managed currencies.

## **Cul-de-sac of a Bank-centered Monetary Regime**

Although a managed currency potentially promised freedom from deflation, that promise was shattered by the Heisei recession. Japan's economy has been in recession since 1991, and the phrase "two lost decades" is starting to replace the phrase "lost decade" among Japanese economists. Japan's government has never declared "an end to deflation" since 1997, when the economy plunged into deflation.

Despite introducing a zero-interest rate policy and quantitative easing, policymakers have never resolved the problem of deflationary recession. The U.S economy entered recession after its housing bubble burst in 2007, sharing the bitter experiences of Japan, and, like Japanese policymakers, U.S policymakers hit the zero bound on interest rates and almost ran out of options.

Such ineffective monetary policy originates in B-regimes, under which money stock does not increase without credit creation by commercial banks. If the central bank disburses money directly to citizens, it will resolve the recession.

## **3 Defects of a Bank-centered Monetary Regime**

The existence of B-regimes adopted by major countries seems to be taken for granted, and they seldom become a focus of criticism. However, monetary regimes are not natural; they are human artifacts with defects. This regime has three limitations: (1) difficulty overcoming recessions, (2) a tendency to create bubbles, and (3) opacity in distributing seigniorage.

### **Difficulty Overcoming Recessions**

Why does a long-run deflationary recession occur? Tsuzuki and Inoue (2010) and Inoue and Tsuzuki (2011) introduce technological change into the New Keynesian Dynamic

General Equilibrium (DGE) model, which is now standard in mainstream economics. Their theoretical analysis provides two conclusions that are instructive for policymakers:

- (1) The long-run inflation rate is equivalent to the gap between the rate of money growth and that of technological change.
- (2) A money growth rate below the rate of technological change brings a long-run negative output gap.

Per these conclusions, we can say that low rates of money growth sponsor long-run deflationary recession. This thesis is consistent with empirical data about the Heisei recession. Money growth fell dramatically around 1991 and did not return to former levels until now. Japanese economists have been debating whether low money growth is the Bank of Japan's fault, and the issue seems irreconcilable. It is certain, however, that it is difficult to increase money stock under a zero interest rate.

Not only interest policy but also quantitative easing becomes invalid under a zero interest rate, because increases in deposit reserves do not bring increases in lending balances under that circumstance. Therefore, even if the quantity of high-powered money increases, money stock will not. This phenomenon is frequently called a liquidity trap. However, the abnormal phenomenon that occurred in Japan's economy differs from a liquidity trap. Inoue et al. (2012) call it a "trap of credit creation" to distinguish it from a liquidity trap. The trap of credit creation means that increases in deposit reserves do not bring about increases in lending balances under a zero interest rate. Because lending balances cannot increase during the trap of credit creation, quantitative easing becomes an invalid policy, and it becomes difficult for central banks to increase money stock. A trap of credit creation can occur only under a B-regime. The reason is that even if deposit reserves increase under the regime, lending balances do not increase unless firms increase their demand for funds.

I elaborate upon Inoue et al. (2012) in what follows. This paper introduces a commercial bank credit creation (money creation) function into a New Keynesian DGE model. Ignoring cash for simplicity of the model, high-powered money consists only of reserve deposits and money stock consists only of deposit balances.

Commercial banks create deposits by lending as a function of firms' demand for funds. Although their ability to create credit is potentially unlimited, their actual ability to do so is constrained by maximum lending amounts or the lower bound on interest rates, which approaches zero. The maximum lending amount is determined by legal reserve rates and the quantity of reserves.<sup>9</sup> The central bank can increase commercial banks' reserves through open market operations, in which case the maximum lending amount increases.

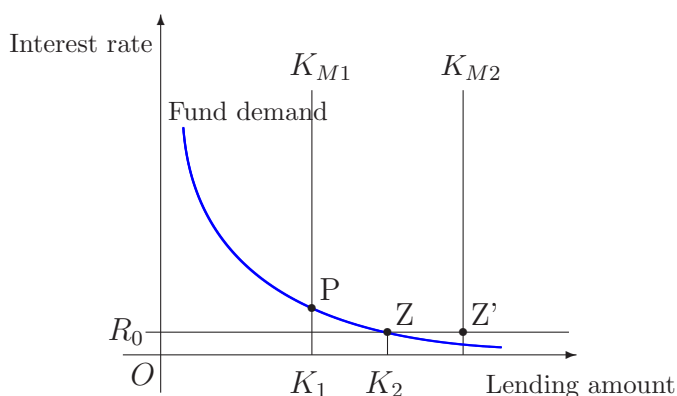


Figure 1: Interest rate and Lending amount

As Figure 1 indicates, banks that find themselves with extra reserves as a result of central bank action are inclined to lower their interest rates to attract borrowers; lower interest rate stimulates business demand for funds. However, when the maximum lending amount is  $K_{M1}$  in Figure 2, actual lending and the interest rate are determined by point P because commercial banks cannot lend more money than  $K_{M1}$ .

On the other hand, when the maximum lending amount is  $K_{M2}$ , actual lending and the interest rate are determined not by point Z' but by point Z because commercial banks cannot reduce the interest rate below the lower bound  $R_0$ , which approaches zero.

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<sup>9</sup>The constraint of legal reserve rate requires  $RES > \bar{\sigma} D$ , where RES is reserve amount,  $\bar{\sigma}$  is legal reserve rate, and  $D$  is deposit amount. Conversely,  $D < D_M (\equiv Res/\bar{\sigma})$  holds, where  $D_M$  is maximum deposit amount. Commercial banks possess also bond, and  $D = K + B + RES$  holds, where  $K$  is lending amount, and  $B$  is bond. Maximum lending amount  $K_M$  is defined as  $K_M (\equiv D_M - Res - B)$ .



The gap between the actual lending amount  $K_2$  and maximum lending amount  $K_{M2}$  in Figure 1 implies the existence of excess reserves. No matter how far rightward line  $K_M$  shifts by increasing reserves, the actual lending amount determined by point Z remains unchanged. Therefore, increases in reserve deposits do not increase lending balances under zero interest (or more precisely, a lower bound close to zero), and quantitative easing does not increase money stock. That is, the trap of credit creation occurs.

Although the model in Inoue et al. (2012) is based on New Keynesian DGE model, it also introduces the viewpoint of endogenous money theory, which has been presented mainly by the post-Keynesian, anti-mainstream school. The endogenous money theory states that money stock depends on business demand for funds. In contrast, mainstream economics implicitly and explicitly analyzes the money economy predominantly on the basis of the exogenous money theory from textbook explanations, such as the IS-LM matrix, to advance research based on the New Keynesian DGE framework.

Exogenous money theory supposes that a central bank supplies money directly to households as if it were dropped by helicopter (Friedman 1969). However, this supposition is different from money circulation in the actual economy.

Money does not enter the system exogenously like manna from heaven nor is it dropped from a helicopter as Milton Friedman often presumes. (Davidson 2003)

Helicopter money and government notes are similar in that they are not mediated by commercial banks but are supplied directly to the private sector. Thus, the money theory of mainstream economics seems more appropriate to pre-modern economies under A-regimes.

Nevertheless, the exogenous money theory has validity as a way to simplify complicated phenomena in the actual economy under B-regimes. As long as the actual reserve rate equals the legal reserve rate, central banks can completely control the money stock, and endogenous money theory has no policy implications different from exogenous money theory.

Although the actual reserve rate is almost equal to the legal reserve rate in normal economies under a positive interest rate, the actual reserve rate deviates notably from the

legal reserve rate under a zero interest rate, as seen in Japan's economy in the 2000s. The exogenous money theory represented by Friedman's "helicopter money" no longer applies to such an abnormal phenomenon i.e., the trap of credit creation because the central bank cannot increase money stock in that case.

Conversely, implementing "helicopter money" enables policy to escape the trap of credit creation. It is achieved by the central bank directly providing money to citizens or underwriting issuance of government bonds. Thereafter, increases in money stock induce household consumption and economic recovery. However, their way implies destruction of the B-regime, under which money stock is determined by commercial bank lending. We might need to discard the B-regime.

## **Tendency to Create Bubbles**

The present monetary regime is irrelevant to today's economy, because the trap of credit creation erects barriers to recovering from deflationary recessions and bubbles can emerge easily under the regime. I call major countries' economies before 1970s "modern capitalism" and their economies after the 1970s "post-modern capitalism." Modern and post-modern capitalism can be respectively interpreted as the transitional state and the steady state in Solow's neoclassical growth model. While higher investment rates brought higher growth rate in the transitional state, economic growth rate becomes equal to the technological rate of change, regardless of the investment rate in the steady state. Therefore, developing economies such as China and India that occupy the transitional state have annual growth rates approaching 7%-10%. Developed economies such as Japan, the United States, and Europe have annual growth rates of 1%-3%, and rates of return on real investment become similar to these rates. In sum, opportunities for profitable real investment are abundant in modern capitalism, but they are limited in post-modern capitalism. As a result, firms are prone to sink money not into real investment but into land or stocks, and bubbles emerge.

Because bursting bubbles bring credit contraction and recession, policymakers must maintain the bubble to avoid recession. During the past 20 years, economies of Japan and the U.S have frequently seen bubbles and recessions. While recession persisted in Japan, which is more cautious about bubbles, bubbles persisted in the United States, which is

more cautious about bubbles. However, even the United States could not avoid the burst of the housing bubble.

Bubbles in post-modern capitalism arise from lack of investment demand. B-regimes make it difficult to avoid them. Under the regime, firms receive money created by commercial banks, which households subsequently receive as wages or dividends. Therefore, if easy-money policies try to boost the economy, financial institutions and other firms will sink money into land or stocks before households increase consumption. A B-regime also encourages poor distribution because only economic entities that hold substantial deposit balances notably financial institutions, big firms, and wealthy households obtain seigniorage. This maldistribution enhances not only economic growth in modern capitalism but also bubbles in post-modern capitalism.

Keynes stated as follows;

In fact, it was precisely the inequality of the distribution of wealth which made possible those vast accumulations of fixed wealth and of capital improvements which distinguished that age from all others. Herein lay, in fact, the main justification of the Capitalist System. If the rich had spent their new wealth on their own enjoyments, the world would long ago have found such a regime intolerable. ( Keynes 1919)

The maldistribution increases saving (investment), and enables rapid accumulation of capital. It is indispensable driving force for modernization, but backfires in post-modern capitalism, and then causes bubble due to lack of profitable investment.

As above stated, B-regime in post-modern capitalism tends to bring bubble, because firms (i.e., investors) precede households (i.e., consumers) in receiving newly-created money and the maldistribution of wealth is encouraged. Therefore, B-regime might be ill-suited to post-modern capitalism

## **Opacity of Seigniorage Distribution**

According to Tsuzuki and Inoue (2010) and Inoue and Tsuzuki (2011), a money growth rate equal to the rate of technological change brings zero inflation and a zero output gap in the long run. Therefore, policymakers should set the rate of money growth equal

to that of technological change. Technological change enables persistent money growth, which produces seigniorage. Thus, technological change can become a sustainable source of seigniorage.

New technology originates from personal inspiration and perspiration and from “standing upon the shoulders of giants.” That is, the power underlying technological change is both personal and social. Although individual innovators deserve rewards for their inspiration and perspiration, a greater amount should be rendered to society as a whole.

Who has a claim on seigniorage? Whether it actually belongs to the whole society or citizens, only some economic entities notably financial institutions, big firms, and wealthy households obtain seigniorage. Distribution of seigniorage under a B-regime is opaque and unfair. If seigniorage is apportioned equally to all citizens, its distribution will be transparent and fair. All citizens have the right to benefit from seigniorage and the transparent and fair distribution is the sanctity of states.

## **4 Proposal of a Citizen-centered Monetary Regime**

### **Reverse of the Money Flow**

To fairly and transparently distribute seigniorage and resolve economic problems in major countries such as Japan and the United States, it is necessary to abolish B-regimes and construct a new monetary regime. I propose the “Citizen-centered Monetary Regime” (C-regime) as ideal. It has two features: First, the central bank directly gives money to households as “citizen dividend” (Douglas, 1924). Second, commercial banks are forbidden from creating credit or are constrained from doing so by a 100% reserve requirement (Fisher, 1935).

A 100% reserve requirement means that commercial banks must hold all money deposited by customers. Under a C-regime, deposits will not be treated as loans to banks, which essentially become cashboxes. Because commercial banks will be unable to lend customers’ deposits, deposits need not be insured nor do they pay interest. Banned from creating money, commercial banks and other financial institutions must acquire lendable funds from financial markets. When only the central bank is given the power to create

money, can it control the stock of money more easily.

This regime reform implies a reversal of the money flow. The money flow under a B-regime is as follows.

Central bank    Commercial banks    Firms    Households

The money flow under C-regime is as follows.

Central bank    Households    Financial institutions    Firms

It is important to note that positions of firms and households are reverse. Households precede firms in receiving newly-created money under C-regime contrary to B-regime.

The proposal is similar to “seigniorage reform” presented by Huber and Robertson (2000). However, their plan seems to aim at restoring A-regime. I consider that seigniorage distribution should not be decided by government, because government using seigniorage can cause hyperinflation, as if old dynasties in China overissued paper money. Therefore, I propose not revival of A-regime but construction of C-regime, under which a central bank gives issued money to all citizens equally.

## **Inflation Targeting**

Excess citizen’s dividend of seigniorage also can cause hyperinflation. In theory, central bank should decide the amount of the dividend in such a way that the money growth rate is equivalent to the technological change rate.

I would not argue that money growth should be fixed under a Friedman-like k-percent rule because the rate of technological change constantly fluctuates and is not easily observable. Therefore, central banks should target the inflation rate, which is equivalent to the gap between the money growth rate and rate of technological change.

The appropriate inflation rate becomes zero based on simple theoretical models as seen in Tsuzuki and Inoue (2010) and Inoue and Tsuzuki (2011). In fact, the appropriate inflation rate is almost 2% because inflation has an upward bias due to downward rigidity in nominal wages. Eventually, a central bank should fine-tune the citizen dividend to peg the inflation rate around 2%.

## Sustainability of Basic Income

If the technological rate of change is 3% and the appropriate inflation rate is 2%, the resultant trend in money growth could be 5%. If so, the citizen dividend also could increase by 5%, eventually creating a basic income that surpasses basic living expenses and meets the “social security” guarantee of a minimum standard of living. A basic income financed by seigniorage could be feasible and sustainable, if the rate of technological change is not extremely low.

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