Assignats or Death: The Politics and Dynamics of Hyperinflation in Revolutionary France*

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Abstract

Following a revolution precipitated by unsustainable government deficits, an explosion of paper money called the *assignat* caused a rapid increase in prices not seen in Europe again until the widespread adoption of discretionary fiat standards in the 20th century. The value of the *assignat* depended on the property the revolutionary government had expropriated to back it. The decision to retire the *assignats* from circulation using the revenue collected from the sale of the expropriated property was ultimately a political one. We examine how shifts in the political equilibrium affected the demand for the *assignat* and find evidence of two money demand shocks that correspond to the collapse of the political support for the *assignats*. Our estimates of the demand for the *assignat* indicate that the first shock reduced the demand for real balances by up to 70%. The second shock caused the negative relationship between real balances and inflation to breakdown entirely. Our results give further credence to the view that politics influences the demand for money as it impacts a currency's fiscal backing.

Keywords: Political Economy, Inflationary Finance, French Revolution

JEL Codes: D72, E31, N13

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Let the French people know well that they need assignat or death.

Edmond Louis Alexis Dubois-Crancé
In front of the National Assembly
Ventôse 4, Year IV

1 Introduction

Following a revolution precipitated by unsustainable government deficits, an explosion of paper money called the *assignat* caused a rapid increase in prices that would not be seen in Europe again until the widespread adoption of discretionary fiat standards in the 20th century (Bernholz, 2016; Sargent & Velde, 1995; White, 1995). Many economists have been critical of the monetary policy of the French revolutionaries (Aftalion, 1990; Crouzet, 1993; Gomel, 1902), which should come as no surprise as it generated the first case of hyperinflation in Western Europe.[1] Yet the *assignat* had at least one great benefit: it spurred advances in monetary theory.

Henry Thornton (1802) used the *assignat* hyperinflation to illustrate how the expectation of future inflation leads to currency depreciation today.[2] In their analysis of the *assignat* hyperinflation, Emile Levasseur (1894) and R. G. Hawtrey (1918) discussed how unsustainable government deficits lead to inflation. More recently, Sargent & Velde (1995) used the *assignat* to show how the demand for money varies with the type of monetary regime. In this paper, we continue the tradition of using the *assignat* to advance monetary theory by examining how changes in political support for the revolutionary currency affected the demand for the *assignat*.

The demand for the *assignat* depended on continued political support because rather than being a pure fiat money it was a type of asset-backed money (White, 1995). Such monies involve an implicit or explicit promise by the government to retire the currency using revenue collected

[1] Moreover, it left France with no option but to resort to taxation to fund its war with the British, who, in contrast to France, were able to fund the war through borrowing and inflationary finance (Bordo & White, 1991; Bordo & Kydland, 1995). The Swedes faced a similar challenge as the French in that they were unable to create a central bank capable of financing war (Hendrickson, 2020).

[2] A year later, J.B. Say (1803) also argued that an increase in expected inflation would lead to a rise in velocity. "This", Say (1803, p.142) argued, "was one of the causes of the prodigious circulation that took place during the progressive depreciation of the French assignats." Nassau Senior (1830) also mentions the *assignats* as an example of the link between expected inflation and velocity in his *Three Lectures on the Cost of Obtaining Money*.

from the sale of the assets backing the currency (Calomiris, 1988). In the case of the *assignat*, the assets backing the revolutionary currency were the property expropriated by the revolutionary government.[3] Hence, the demand for the *assignat* depended upon the likelihood currency will be retired from circulation as promised in addition to the normal determinants of the demand for money, such as expected inflation.

Earlier studies of the demand for the *assignat*, such as that by Brezis & Crouzet (1995), used Cagan's (1956) model of the demand for money under hyperinflation. Their estimates assumed that the Cagan model applied to the entirety of the *assignat's* existence. On the other hand, Sargent & Velde's (1995) argue that only the final two years of the revolutionary currency's existence appear to be consistent with the Cagan model. Contrary to both Brezis & Crouzet (1995) and Sargent & Velde's (1995), we argue that the *assignats* hyperinflation was not fully consistent with Cagan's classical model as changes in the political equilibrium affected the fiscal backing of the *assignats*. The demand for real *assignat* balances was not stable but depended on the political commitment toward the revolutionary currency.

We examine the effect weakening political support for the *assignats* had on their demand during the final years of its existence. Using Bai & Perron's (1998; 2003) method of estimating structural breaks, we identify two breaks in the relationship between real balances and inflation in June and November 1795 that correspond to a weakening of the *Jacobin* left —the *assignat's* primary political supporters. The first structural break in June 1795 corresponds to a failed insurrection and the subsequent weakening of the *assignats*' fiscal backing. The second break in November 1795 corresponds to the establishment of a new political regime: the Directory —an event that portended the *assignat's* eventual demonetization.

Using the empirical methods proposed by Taylor (1991) and Engsted (1998) to estimate the demand for the *assignat* between May 1794 and May 1796, we find that the behavior of real balances and inflation was somewhat consistent with the Cagan model of money demand, but that this relationship broke down after the establishment of the Directory in November 1795.

[3]This expropriation had substantial and long-lasting effects on agricultural productivity in 19th century France (Finley et al., 2021).

We also find that the weakening of the Jacobin Left's control over the legislature around late May / early June 1795 reduced the demand for real balances by as much as 70%. As a result, the maximum potential annual seignorage revenue fell from around 2 billion pounds in specie (33% of GDP) to roughly 800 million (14% of GDP). In short, the erosion of the *assignat's* political support brought about a contraction of the inflationary tax base, thereby worsening the already disastrous conditions of the public finances. By the end of the *assignat* hyperinflation, seignorage alone could no longer cover current expenses.

There is an extensive literature on asset-backed currencies.[4] One challenge scholars working in this area face is a lack of data, which prevents comprehensive empirical analysis. As a result, disagreement between quantity and backing theorists continues to persist. Since we have access to relatively high-frequency money supply and price-level data, our paper can contribute to this literature by highlighting both the quantity- and backing-theoretic aspects of the *assignat*. Our empirical analysis demonstrates that although the relationship between the growth rate of the *assignats* and the inflation rate was consistent with the quantity theory, the relationship between their fiscal backing and the price level was consistent with the backing theory. Thus, the two theories may not be mutually exclusive.

There is also an extensive literature on inflationary finance that was started by Cagan (1956) and Bailey (1956).[5] This literature often assumes a stable relationship between real balances and expected inflation and has typically eschewed the political economy of inflationary finance.[6] Given the link between political instability and inflationary finance (Aisen & Veiga, 2006, 2008; Cukierman et al., 1992), neglecting the effect that changes in the political equilibrium can have on the demand for money will result in misleading estimates of the demand for money.[7] Our

[4]See, for example, Calomiris (1988); Cutsinger et al. (2022); Grubb (2003, 2006, 2016a,b, 2017, 2018, 2019); Rousseau (2007); B. D. Smith (1985a,c); West (1978); Wicker (1985).

[5]See, for example, Barro (1972); Engsted (1993, 1994, 1996); Frenkel & Taylor (1993); Miller & Ndhlela (2020); Mladenović & Petrović (2010); Petrović & Vujošević (1996); Petrović & Mladenović (2000), and Phylaktis & Taylor (1993).

[6]There are, of course, exceptions. See, for example, Cutsinger & Ingber (2019); Michael et al. (1994); Pittaluga et al. (2020) and Sargent (1982). Other factors that may destabilize the demand for money is financial innovation that occurs in response to high inflation (Arrau & De Gregorio, 1993; Arrau et al., 1995).

[7]Barro (1983); Brennan & Buchanan (1980, 1981) make a similar point about the demand for money and the "rules of the game" underlying the money creation process.

paper contributes to this literature by illustrating and quantifying the effect that changes in the political equilibrium can have on the demand for money and the importance of incorporating such changes into the analysis of inflationary finance.

2 The *assignats* from their creation to hyperinflation

2.1 The fiscal crisis and the creation of the *assignats*

The French Revolution was first triggered by a fight between the King and the parliament of Paris regarding public finances. By 1788, government deficits were no longer sustainable. More than 20% of government revenue came from borrowing. Nearly 50% of government spending consisted of debt and interest payments (Braesch, 1934). The King summoned the Estates Generals in a desperate attempt to solve the regime's fiscal problems. As a member of the Committee of Finances in the Legislative Assembly later declared, by 1789, even "loans, fatal and last resource of our finances, had become impossible" (Montesquiou, 1791, p. 8).

The Estates Generals became quickly bogged down in a conflict between the clergy, the nobility, and the third-estate, about voting procedures. This conflict led members of the third-estate to break away from the two other estates and to declare themselves the National Assembly in June 1789. Yet the new parliament inherited the "unpleasant fiscal arithmetic" that gripped the *Ancien Régime* (Sargent & Velde, 1995). The situation seemed hopeless. In November 1789, Montesquiou (1789) spoke in front of the National Assembly and informed his colleagues that the debt due amounted to 557 million pounds, more than one entire year of revenue. Worse still, the government was on the wrong side of the bond finance "Laffer curve." In August 1789, Jacques Necker, the minister of Finances, tried to open two loans, one for 30 million pounds at 4.5% interest and another for 80 million at 5%. Both attempts failed to raise the revenue announced. Having recognized his mistake, Necker reported to the Assembly on September 24 that "new loans can only increase the current deficit" (*Archives Parlementaires* 9:143).

By the end of the Summer of 1789, some members of the newly created National Assembly

started to suggest that the assets owned by the clergy could be seized by the state and auctioned to address the deficit (Crouzet, 1993). On November 2, 1789, the Assembly voted for the nationalization of the ecclesiastic properties —568 votes for and 346 against. While expropriating the Church's assets helped the government remain solvent, resources were still needed to pay the debt due. The new "national assets" could not be auctioned off fast enough to pay back creditors.

A debate about how to cover the current deficit ensued. "The question," said Roederer to his colleagues in the National Assembly, "is how are you going to meet the needs of the moment, regardless of taxes" (*Archives Parlementaires* 10:280). On November 27, 1789, the Assembly first discussed a project proposed by Necker that would have transformed the Caisse d'Escompte into a national bank issuing paper money loaned to the government. Many revolutionaries, however, perceived the Caisse as an institution loyal to the *Ancien Régime*, and the Assembly rejected Necker's proposal (Crouzet, 1993). Instead, the Assembly created the *assignats* on December 19, 1789.

The *assignats* were first designed as a debt instrument. They were not redeemable in specie but were, at least initially, considered as good as gold in church asset sales.[8] The prospect of the *assignats* being a perfect substitute for gold in church assets auctions was enough to give them value. Adam Smith (1776) suggested that the government can give value to paper money by accepting it in payments of taxes.[9] French Revolutionaries had precisely this mechanism in mind when creating the *assignats* but adapted it to the payment of church property during their privatization instead of the payment of taxes.[10]

The decrees of December 19-21, 1789, planned the concomitant sale of clergy assets and issue of *assignats* for 400 million pounds. In these initial decrees, the *assignats* were supposed to be retired within 5 years. This deadline was repealed by a decree in April 1790, which nonetheless

[8] Sargent & Velde (1995) give a detailed account of how church assets were auctioned.

[9] This insight is at the core of the "backing" theory of money demand and its subsequent development into the fiscal theory of the price level. See Calomiris (1988) and Cochrane (2022) for additional details.

[10] The *assignats* became receivable in the payment of taxes with a decree passed on September 12, 1790. However the *assignats* used in the payment of taxes were not burnt and retired from circulation. In that sense, the French national assembly backed their *assignats* liabilities by a specific revenue stream –the sale of church assets.

ordered that the *assignats* be burnt each time some church asset was sold in auctions.[11]

The commitment to retire the *assignats* from circulation meant that their real value would be equal to the present value of real primary surpluses. Since the revolutionary government could not rely on borrowing to finance the deficit but had instead to rely on issuing *assignats*, the government budget constraint in real terms is:

$$\frac{M_t}{P_t} = \frac{M_{t-1}}{P_t} - s_t \tag{1}$$

where M_t is the nominal supply of *assignats* at time t, P_t is the price level, and s_t is the real surplus of tax revenue over government spending, including debt service. Iterating forward and solving for the real supply of *assignats* we get:

$$\frac{M_t}{P_t} = \sum_{i=1}^{\infty} \frac{s_{t+i}}{(P_{t+i}/P_{t+1+i})^i} = \sum_{i=1}^{\infty} \frac{s_{t+i}}{R^i} \tag{2}$$

where R is the gross interest rate. Agents are willing to hold interest-free *assignats* "overnight" only if the rate of return is equal to that on alternative assets. This implies that the real value of the *assignat* supply is equal to the present value of future budgetary surpluses.

Some economists have argued that church assets could have maintained the value of the *assignats* only if they had been redeemable in fixed quantities against clergy property (Say, 1803; Wicksell, 1968). The fiscal backing view suggests otherwise. Making *assignats* perfect substitutes to specie in auctions and guaranteeing that the sale of church assets entailed retiring *assignats* from circulation meant that, as long as the quantity of *assignats* was less than the value of church assets sold, they would trade at par with gold.

Consider an example where the specie value of church assets is 10 million pounds, and *assignats* have no other use than buying church assets. If the government issues 9 million pounds of *assignats*, then they will trade at par with gold when the church assets are auctioned

[11] As Sargent & Velde (1995, p.515) explain: "When payment was made in assignats, the assignats were canceled immediately and then sent to Paris for burning. When payment was made in coin, the coins were sent to Paris and then exchanged at the Treasury for assignats held by the Treasury, which were then canceled and burned."

off. Since the nominal amount of *assignats* is less than the specie value of church assets, 1 million of specie will be used in the auction as well. In this case, the *assignats* will be as good as gold at auction.

Now, suppose the supply of *assignats* is greater than 10 million. Under these circumstances, people will cease using specie in auctions entirely, opting instead to purchase church assets with *assignats*, which will depreciate as the price of church assets is bid up. If 100 million pounds of *assignats* are issued then, in equilibrium, the *assignat* price of specie will be 10 to one. Alternatively, suppose the government issues 100 million pounds worth of *assignats* that can only be used to purchase church assets at auction one year hence. In this case, the *assignat* must appreciate at a rate equal to the rate of return on alternative assets. Otherwise people would not be willing to hold positive quantities of *assignats*. For instance in our example, if the real interest rate is 10%, the equilibrium *assignat* price of specie must be 11 to one in the current period.[12]

The government did not initially intend for the *assignats* to be money but instead used the *assignats* as a debt instrument (Crouzet, 1993, p.107). The first issues of the *assignats* were negotiable instruments with space on the back where owners would sign their names. Until October 8, 1790, the *assignats* issued also bore interest—5% until April 1790, 3% afterward.[13] Nor did the government intend to use the *assignats* to finance the primary budget deficit. Their intended purpose was to assist in liquidating the existing public debt (Sargent & Velde, 1995; Crouzet, 1993). Between January and December 1791, the *assignats* only depreciated by 4.3% despite the quantity of *assignats* increasing by nearly 250% over this same period, reaching 1,360 million pounds in December (Crouzet, 1993).[14]

One interpretation of the relative stability in the value of the *assignats* is that they were, above all, a government liability. In that context, exchanging *assignats* for government bonds

[12]If the *assignats* provide liquidity services, however, then they need not appreciate at a rate equal to the interest rate.

[13]Dupont de Nemours rightfully explained in front of the assembly that if the debt were paid back with *assignats* bearing no interest, this would amount to a partial bankruptcy (*Archives Parlementaires* 9:158-159).

[14]For comparison, Crouzet (1993) estimates that in December 1790, the amount of specie in circulation was roughly 1,300 million pounds.

would not affect the price level, provided doing so leaves fiscal policy unaltered (Wallace, 1981; Sargent & Smith, 1987). In September 1789, Dupont de Nemours, economist, and member of the National Assembly made a similar point in front of the parliament: "In the position you are in, the paper you would spread; whether it bears interest, or that it does not bear interest, would never be anything but a debt security, exchanged for another debt security." (*Archives Parlementaires* 9:158).[15]

If, for instance, the French government retires 10 million pounds of government bonds by issuing 10 million pounds of *assignats* while future fiscal surpluses remain constant, then the present value of future issues of *assignats* will fall by 10 million pounds as well. Thus, provided the path of fiscal policy does not change, issuing more *assignats* by purchasing government bonds means a lower supply of *assignats* in the future, which prevents prices from rising today by lowering expected inflation. Only permanent increases in the money supply would lead to a proportionate increase in the price level (Sumner, 1993). Since most of the *assignats* issued initially were backed by the promise of future fiscal surpluses generated by the sale of church property, prices did not drastically increase in the early years of the *assignat's* existence.

2.2 The *assignat* hyperinflation

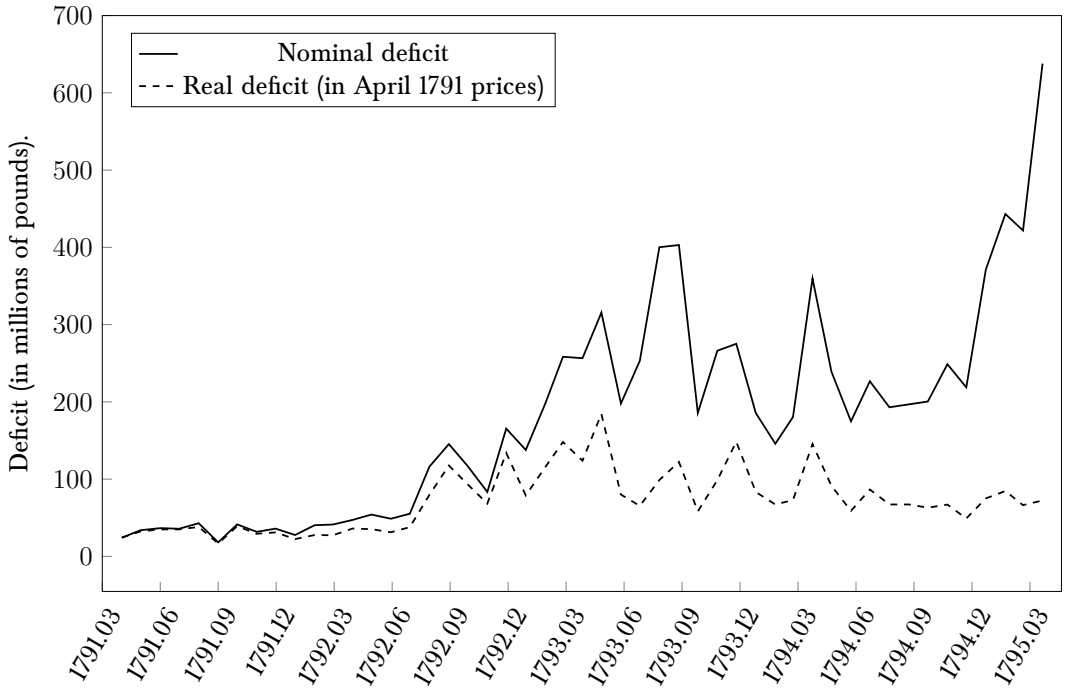
According to Sargent & Velde (1995), the primary function of the *assignats* —i.e., liquidating the public debt— was respected until April 1792, when public spending surged following the beginning of hostilities against the first coalition. Indeed, the declaration of war in April 1792 was followed by an almost ten-fold increase in the "real" deficit (Figure 1). Once it became clear that the *assignats* would finance the deficit while a tax reform stalled, inflation started to increase.[16] As early as 1793, Saint-Just argued in a letter that France was already in a

[15] An alternative explanation for the relatively mild depreciation of the *assignats* before 1792 is that the increase in their supply drove specie out of circulation thus leaving the total money supply fairly constant. Both the "fiscal backing" and the "currency export" explanations have been offered in the context of the behavior of the real supply of colonial currency. With respect to this historical episode, see B. D. Smith (1985b,d) for a defense of the "fiscal backing" theory and McCallum (1992) for a defense of the "quantity theory" predicated on the idea that specie exports left the money supply relatively unchanged.

[16] By November 1792, some parliamentarians such as Jacob Dupont complained about the "lack of attention" given to recovering taxes. (*Archives Parlementaires*, 53:384).

hyperinflation dynamic. "The more assignats we create," Saint-Just argued, "the more the relative value of specie increases, and the more specie increases, the more assignats must be created." (Gross et al., 1962, p. 225).

Figure 1: Monthly Government Deficit



Source: Archives Parlementaires

The depreciation of the *assignats* after the beginning of the war was twice interrupted by periods of appreciations when the value of "national assets" used to retire *assignats* from circulation increased. For instance, by March 1793, the French government had annexed the county of Nice, Savoy, Belgium, and some German territories. This increased the prospect of greater fiscal backing for the *assignats*, especially with the nationalization of church assets in those territories. On March 8, a Parisian newspaper notices: "[W]e do not doubt that with the immense resources from ecclesiastical assets in the Austrian Netherlands, which under this aspect Cambon calls the promised land of the revolution, in the bishopric of Liège, duchy of Savoy, county of Nice etc., etc. the backing of our assignats is tripled and that they take back

their first favor."[17] The *assignats* indeed appreciated.

Inflation started to increase dramatically after the Fall of Robespierre in June 1794, and by the beginning of 1795, France was in a hyperinflationary dynamic that would last until April 1796. By the end of 1794, the deficit was out of control, tripling from 219 to 638 million pounds from December 1794 to April 1795 (Figure 1). Tax collection at that point was virtually nonexistent. Taxes covered only 12% of total government spending in February 1795, 9.9% in March, and 6.4% in April.[18]

Although we do not have data about the monthly deficit after April 1795, we know how much the government relied on inflationary finance. Figure 2, calculates the weekly real seigniorage expressed in December 1790 prices.[19] On average, the French government raised real seigniorage equivalent to 15.2 million pounds from December 1790. In comparison, in 1790, the French government spent 690.7 million pounds (Braesch, 1934), or an equivalent of 13.3 million pounds per week —represented by the horizontal line in Figure 2. In other words, seigniorage alone was sufficient to finance a level of public spending greater than the entire 1790 budget for most of the period studied.

2.3 The economics and politics of the *assignat* hyperinflation

The *assignat* hyperinflation is peculiar as it overlaps with a constitutional change.[20] In the first days of November 1795, a new regime, with a new constitution and legislature, was established. This change was characterized by the unfolding of a long and turbulent struggle between different factions in the National Assembly, especially between the *Girondins* and *Jacobins*. The new regime reflected a change of attitude toward the *assignat* (Levasseur, 1903; Crouzet, 1993). Political support for the paper money weakened as the *Jacobins*, who had relentlessly supported the

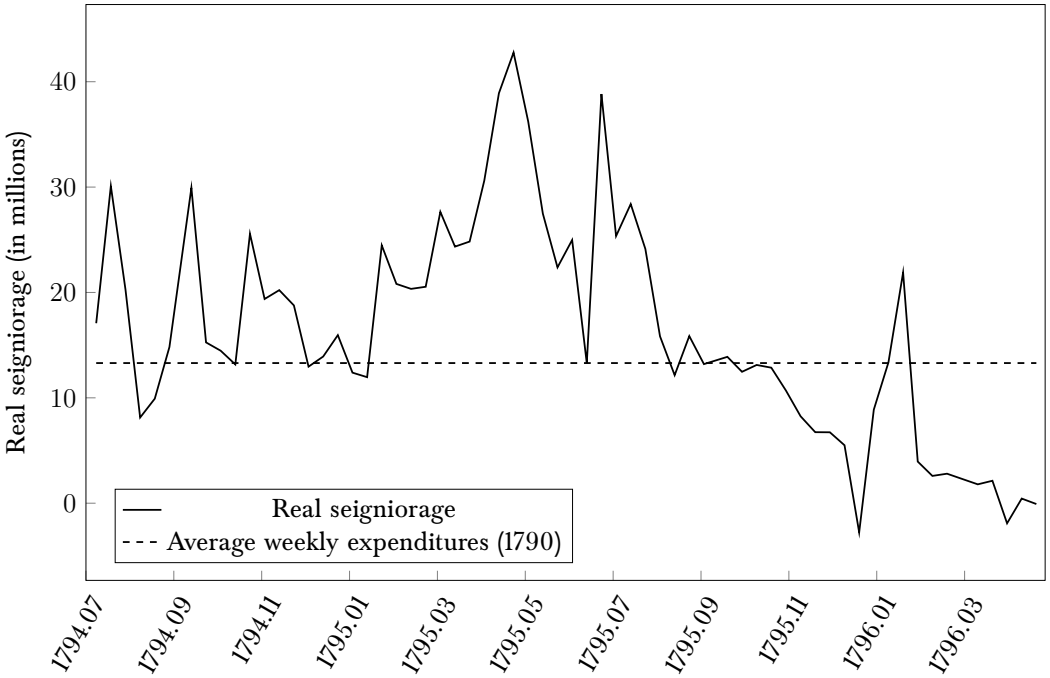
[17] *La Révolution de 92, ou Journal de la Convention Nationale*, n°170, March 8, 1793. p.2-3.

[18] For the month of February, see *Le Moniteur Universel*, n°165, March 5 1795, p.595. For March see: *Journal des débats et des décrets*, n°912, p.134-135. For April see: *Collection générale des décrets rendus par la convention nationale* Vol. 61 (Floréal an III; 20 avril-19 mai 1795), p.58-59.

[19] Following Sargent & Velde (1995), we estimate real seigniorage as being equal to $\frac{M_t - M_{t-1}}{0.5(P_t + P_{t-1})}$. Weeks here are "revolutionary" weeks and differ from the Gregorian calendar in that they are 10 days long instead of 7.

[20] The Hungarian hyperinflation is also peculiar in this regard.

Figure 2: Real Seigniorage in December 1790 Pounds.



Sources: de Nogaret (1800), Caron (1909).

interests of ***assignats*** holders, lost their grip on the reins of power. Simultaneously, the advent of the Directory increased the political influence of monarchists, which meant that some of the fiscal backing of the ***assignats*** was now in question, especially as the assets owned by nobles who emigrated abroad and the royal domain were expropriated and considered "national assets." The establishment of the Directorial regime likely meant the ***assignat***'s days were numbered, and consequently, the demand for paper money collapsed.

The classic work on inflationary finance by Cagan (1956) and Bailey (1956) is predicated on the idea that the demand for money is stable. The Cagan style money demand function can be represented as follows:

$$\frac{M_t}{P_t} = L(i_t; y_t) \tag{3}$$

where M_t/P_t represents the real money supply, i_t represents the nominal interest rate, and y_t represents income. Since, Cagan argued, inflation swamps the effect of both changes in the real

interest rate and income in times of hyperinflation, we can represent money demand as a simple function of expected inflation.

The presence of a stable money demand function is, above all, a testable proposition. Our econometric exercise in Section 5 provides evidence against Cagan's approach. Changes in the political equilibrium led to either a shift in the demand for money or a complete collapse in the negative relationship between inflation and real money balances. In Section 5, we identify two structural breaks in that relationship. One around November 2, 1795, corresponds to the establishment of the new Directorial regime. The other, on June 9, 1795, corresponds to a failed *Jacobin* insurrection and the subsequent restitution of a portion of the "national assets" to their prior owners.

The change in the political equilibrium brought about by the Directory weakened the fiscal backing of the *assignats* and induced fears that they would be demonetized.[21] As a result, after November 1795, the liquidity services provided by the *assignats* declined sharply, and an increasing portion of the population refused to accept the *assignats* in payments.[22] The result was a complete breakdown of the negative relationship between inflation and real money balances. The *assignats* increasingly became speculative assets whose value varied with variations in the expectation that they would be retired from circulation through the sale of national assets.

If the *assignats* stopped being valued as money, then there is no particular reason to believe we would observe a negative relationship between real money balances and inflation in the data after the establishment of the Directory. Changes in the expected present value of future surpluses will impact prices and therefore observed inflation. But this kind of inflation is fully unexpected and does not impact the real value of the *assignat* supply at time t. In the absence of money demand for the *assignats*, the expected inflation rate is the negative of the real interest rate, and the *assignats* can only depreciate if there are (unexpected) changes in the expected present value of future surpluses. We can rewrite Equation 2 as follows:

[21] We provide evidence of this change in political equilibrium within the parliament with the advent of the Directory in appendix C.

[22] This was especially true the further away you moved from Paris: "[W]e do not quote prices [of wheat] in assignats." (*Journal de Marseille*, October 11, 1795, p.348).

$$\frac{M_t}{P_t}\Delta E_{t+1}\left(\frac{P_t}{P_{t+1}}\right) = \Delta E_{t+1}\sum_{i=0}^{\infty}\frac{s_{t+1+i}}{R^i} \tag{4}$$

where $\Delta E_{t+1} = E_{t+1} - E_t$. Since at time $t+1$, M_t and P_t are already determined, unexpected inflation results from changing expectations about the present value of future fiscal surpluses (Cochrane, 2011, 2022; Davig et al., 2011). Additionally, unexpected inflation, in this case, is not negatively related to real money balances (M_t/P_t). If we are right that the constitutional change which occurred in November 1795 was associated with a fall in both the fiscal backing and liquidity demand for *assignats*, then we should expect both a weakening in the negative relationship between expected inflation and real money balances and a fall in real money balances. The evidence is consistent with our hypothesis.

The relationship between the value of national assets and the *assignats* was known by most politicians during the Revolution as can be verified by many interventions in front of the parliament. To pick only a few examples, in December 1795, Lafond-Ladébat declares that "from the moment that a single assignat was issued beyond the real value of national property, the barrier of public order was broken; and the degradation of the assignats became all the more rapid."[23] The same month, Ramel noticed when speaking in front of the Assembly that the decision, taken on November 25, 1795, to give soldiers some of the national assets worth one billion in specie reduced the fiscal backing of the *assignats* and contributed to their depreciation.[24]

3 The demand for money during hyperinflation

The standard approach to estimating the demand for money during hyperinflation originated with Cagan's (1956) study of several European hyperinflations. When prices are rapidly increasing, Cagan argued, the effect of real factors on the demand for money can safely be ignored because the effect that changes in these factors would have on the demand for money would

[23] *Le Moniteur Universel*, n°78, December 9, 1795. See also Lecouteux de Canteleu's (who later became one of the founders of the Bank of France) intervention on December 9, 1795 in front of the assembly.

[24] *Le Moniteur Universel*, n°85, December 16, 1795.

be minuscule compared to the effect brought about by people's inflation expectations. Thus, Cagan proposed a money-demand function where the primary determinant of the demand for real balances is the expected rate of inflation.

Cagan's (1956) model of the demand for money during hyperinflation can be written as:

$$m_t - p_t = -\alpha[E_t p_{t+1} - p_t] + u_t \tag{5}$$

where m and p denote the natural logarithms of the money supply and price level, respectively, α is the semi-elasticity of the demand for real balances with respect to expected inflation, E_t is the conditional expectation operator, and u_t is a random disturbance term capturing the effect of money-demand shocks.[25]

As shown by Taylor (1991), we can rewrite Equation 5 to illustrate the conditions under which Cagan's model can be consistently estimated:

$$(m_t - p_t) + \alpha \Delta p_t = -\alpha \Delta^2 p_{t+1} + (u_t - \alpha \eta_{t+1}) \tag{6}$$

where Δ is the first-difference operator and η_{t+1} is the forecast error, i.e., $\eta_{t+1} = (p_{t+1} - E_t p_{t+1})$, which we assume is stationary. If we further assume that money-demand shocks are also stationary and real balances and inflation are $I(1)$ processes, then Equation 6 indicates that the linear combination of $(m_t - p_t) + \alpha \Delta p_t$ will also be stationary. Under these conditions, real balances and inflation will be cointegrated, and thus Equation 5 can be estimated super-consistently regardless of how people form their inflation expectations and despite the presence of simultaneity or omitted variable bias (Stock, 1987).

We can take the analysis a step further, however. Suppose that the money market is always in equilibrium, and people form their expectations rationally. In this case, the price level at time t is a function of the contemporaneous money supply and people's expectations of the future

[25] We have omitted the constant term for notational simplicity, however we include a constant in our empirical analysis.

path of the price level. Under these assumptions, Equation 5 can be rewritten with p_t on the left-hand side and solved recursively forward yielding:

$$p_t = (1-b)\sum_{i=0}^{T-1} b^i E_t(m_{t+i} - u_{t+i}) + b^T E_t p_{t+T} \tag{7}$$

where $b = \alpha/(1-\alpha)$. If we rule out the possibility of rational bubbles by imposing the transversality condition $\lim_{T\to\infty} b^T E_t p_T = 0$,[26] then Equation 7 can be simplified to yield:

$$p_t = (1-b)\sum_{i=0}^{\infty} b^i E_t(m_{t+i} - u_{t+i}) \tag{8}$$

Following Engsted (1993), Equation 8 can be rewritten to highlight another implication of the Cagan model:

$$(m_t - p_t) + \alpha\Delta m_t = -(1-b)^{-1}\sum_{i=1}^{\infty} b^i E_t \Delta^2 m_{t+i} + (1-b)\sum_{i=0}^{\infty} b^i E_t u_{t+i} \tag{9}$$

Equation 9 implies that if money-demand shocks are stationary and the growth rate of the nominal money supply is an $I(1)$ process, then the linear combination of $(m_t - p_t) + \alpha\Delta m_t$ will also be stationary. Thus, the Cagan model under the assumption of continuous market clearing, rational expectations, and no rational bubbles implies that real balances and the growth rate of the money supply will also be cointegrated, with a cointegrating parameter equal to that found by estimating Equation 5.

In sum, if real balances and inflation during the final years of the ***assignat's*** existence are both $I(1)$, and if there is evidence of a cointegrating relationship between the two series, i.e., u_t is $I(0)$, then Cagan's model of the demand for money applies to the ***assignat*** hyperinflation. Moreover, if the growth of the ***assignats*** during this period is $I(1)$, and if there is evidence of a cointegrating relationship their growth rate and real balances, then we can rule out the possibility that self-fulfilling expectations were driving the rapidly increasing price level during

[26] This limit is zero except if the log of the price level p_t grows exponentially at a rate greater than $(1+\alpha)/\alpha$, which would imply that the level of prices grow at an ever increasing rate.

the *assignat* hyperinflation. As we describe in section 5, we find that these conditions do apply the *assignat* hyperinflation, and thereby able to estimate the demand for the revolutionary currency. Before proceeding further, however, a brief description of the available data from that period is in order.

4 Data

Estimating the demand for money during the *assignat* hyperinflation requires data on the stock of *assignats* and the price level. Our measure of the supply of *assignats* comes from data copied from the Treasuries registers by Ramel de Nogaret (1800). This series begins on May 10, 1794, and ends on May 10, 1795. To measure the price level, we use data from Caron (1909) on the *assignat* price of specie (*numéraire*) over that same period.[27] The *assignat* price of gold tracks the prices of other commodities published in *Le Moniteur Universel* between August and December 1795 quite closely and is thus a suitable measure of the price level in our opinion (see Appendix A).[28]

Ramel de Nogaret (1800) estimated the supply of *assignats* by taking the difference between the number of *assignats* burnt and the number issued by the Treasury and reported these estimates at 10-day intervals.[29] While prior work on the *assignat* has used de Nogaret's data at a monthly frequency, e.g., Sargent & Velde (1995), we use this data in its original form. Our reason for doing so is that lower-frequency data can produce misleading results when trying to identify changes in the demand for money because people adjust their money balances more rapidly during periods of severe inflation (Mladenović & Petrović, 2010).[30]

[27] Gold was widely used as a medium of exchange at this time. For instance in 1798, Crétet declared in front of the *Conseil des Ancients* that "the most important commerce, that of agricultural goods, is almost exclusively done with gold." (cited in: Crouzet 1993, p.34).

[28] Those data are consistent and completed with the data published in the *Journal de Paris* during the same period.

[29] The idiosyncrasies of the French revolutionary calendar means that each week is 10 days long.

[30] When converted into a monthly series, the data given by de Nogaret (1800) is nearly identical to the data used by White (1987). The correlation coefficient between the two series is 0.999, and the correlation coefficient between their growth rates is 0.973. In fact, the two series have a one-day lag. While de Nogaret (1800) reports the money supply data on the 1, 11, and 21 days of the month, White (1987) reports the money supply on the last day

Caron's (1909) data reports the quantity of specie that could be purchased with 100 pounds of *assignats*. This data comes from the *Tableaux de Dépréciation*—a table listing the prices of gold, foodstuff, real estate, and other commodities that enabled debtors who had contracted their debt in *assignats* to settle their debt. The law of June 23, 1797, required each department to collect these figures in order to account for the depreciation of paper money. White (1991, p. 245) argues that the departmental figures are "a fairly accurate measure of inflation [...], particularly during the last and most rapid phase of inflation." We use price data for the department of the Seine, i.e., Paris, as the price series for the other departments are much less comprehensive.

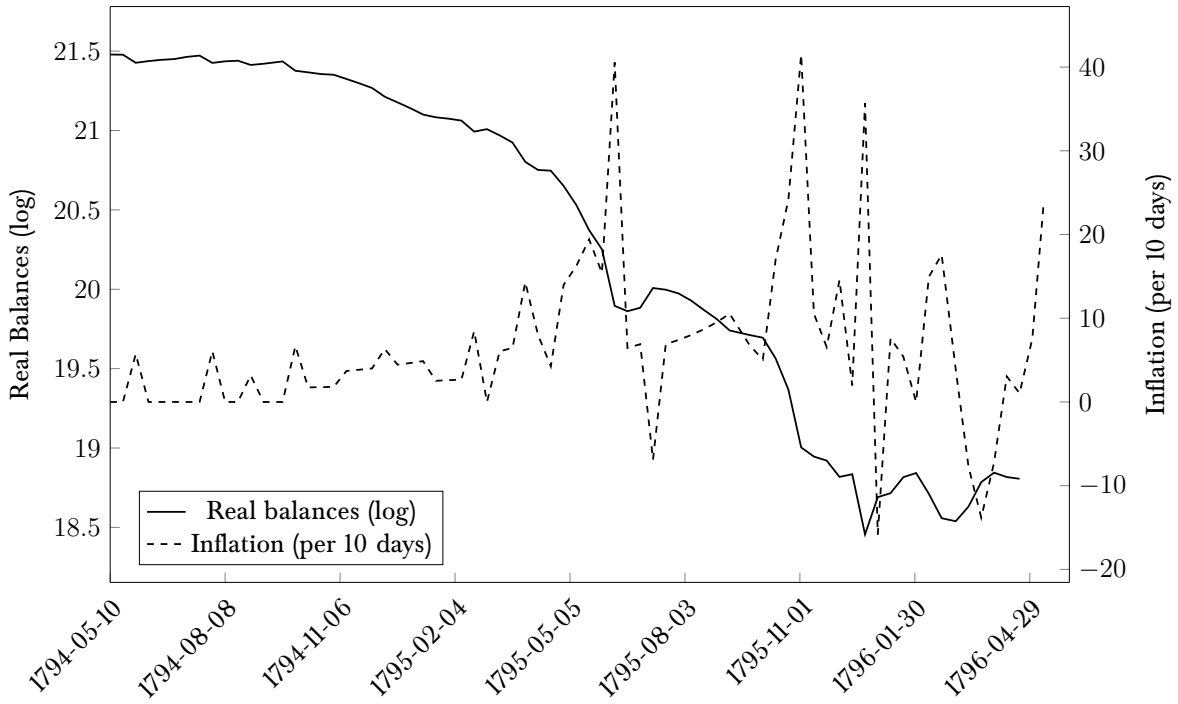
Using the *assignat* price of gold as a measure of the price level is further justified by the tendency for the medium of account and the medium of exchange to separate during periods of severe inflation (McCallum, 1989, p. 18). Indeed, by the end of 1795, many merchants quoted the prices of goods and services in terms of gold but continued to accept the *assignat* as a means of payment until 1796 —at least in Paris. For example, a police report from December 9, 1795, describes how "if they [Parisian Merchants] sell for *assignats*, it is only after having calculated the numéraire they worth at the stock exchange." (Aulard, 1899, p. 489).[31]

To construct a measure of real balances, we use de Nogaret's estimates of the stock of outstanding *assignats* and deflate these estimates using Caron's data on the *assignat* price of gold. We also use Caron's data to create a measure of inflation, which we calculate as the first difference of the natural logarithm of the *assignat* price of gold. Figure 4 illustrates the time paths of both series. The behavior of real balances and inflation during the *assignat* hyperinflation is similar to that of the 20th century episodes of hyperinflation originally studied by Cagan (1956)—real balances decreased relatively slowly at first and then fell substantially as inflation both increased and became more volatile.

of the month (the 30th). To calculate the correlation coefficients, we matched the data from the 30th with the data from the 1st.

[31]See also Aulard (1899, p. 508)

Figure 3: Real balances and inflation



Sources: Caron (1909) and de Nogaret (1800)

5 Empirical analysis of the demand for *assignats*

5.1 Fiscal backing and the demand for *assignats*

Cagan's (1956) model of money demand during hyperinflation posits a negative relationship between real balances and expected inflation. Before we estimate this relationship, however, we need to assess whether changes in the *assignat's* fiscal backing affected the demand for the revolutionary currency; failing to account for such changes could bias our estimates of the demand for *assignats*. To do so, we begin our analysis by testing for the existence of structural breaks in the relationship between real *assignat* balances and inflation without imposing known break dates. Other researchers have used this approach to capture the effect of changes in the fiscal backing of other currencies—two notable examples being Weidenmier (2002) and Willard et al. (1996).

We use the method proposed by Bai & Perron (1998, 2003), which permits multiple struc-

tural breaks in a linear model estimated by least-squares.[32] This dynamic algorithmic method is less sample dependent than other structural break tests. It allows a subset of the parameters to remain constant, which yields efficient breakpoints that minimize the sum of the squared residuals. In addition, this method yields estimates of confidence intervals regardless of the structure of data and error distribution. Our tests identified two structural breaks in the relationship between real balances and inflation—one on June 9 and another on November 2, 1795. As Table 1 illustrates, the test statistic is significant at the 99% level, and both dates exhibit a tight, two-period confidence interval.

As we describe in Section 3, under certain assumptions, the Cagan (1956) model also implies the existence of a relationship between real balances and the growth rate of the money supply. As such, we tested for the existence of a structural break in this relationship as well. Our test identified two structural breaks in the relationship between real balances and the growth rate of the *assignat*. As before, the test statistic is significant at the 99% level, with a similarly tight confidence interval around the estimated break dates, which occur 10 days earlier when using the growth rate of the *assignat*: May 30, 1795, and another on October 23, 1795. Note that since both time series have a frequency of 10 days, this difference is not as large as it seems.

Table 1: Structural break tests

Notes: The sample runs from May 10, 1794 to May 10, 1796. $m_t - p_t$ denotes real balances, Δp_t the inflation rate and Δm_t the growth rate of the *assignats*.

Relationship Tested	Test statistic	1st Estimated Break Date	2nd Estimated Break Date	99% confidence intervals
$m_t - p_t$ and Δp_t	651.94***	June 9, 1795	November 2, 1795	+/-10 days
$m_t - p_t$ and Δm_t	640.74***	May 30, 1795	October 23, 1795	+/-10 days
*** p<0.01, ** p<0.05, * p<0.1				

Table 2 reports the summary statistics for the real balances, inflation, and the growth rate of the *assignats* for each of the three periods our structural break test identified.[33] Between May 10, 1794, and June 9, 1795, inflation averaged roughly 4.6% every 10 days while the growth

[32] We used the Stata package provided by Ditzen et al. (2021) to conduct the structural break tests.

[33] Note that the summary statistics for the growth rate of the *assignats* corresponds to the the three periods identified by the structural break test on the relationship between real balances and inflation rather than the test. Summary statistics using the periods identified by the structural break test on the relationship between real balances and the growth rate of the *assignats* are available upon request.

rate of the *assignats* averaged 1.5%. Both inflation and the growth rate of the *assignats* increased substantially during the period running from June 19, 1795, through November 2, 1795, averaging roughly 13% and 4.5% every 10 days, respectively. After the establishment of the Directory in November 1795, however, both inflation and the growth rate of the *assignats* decreased, averaging roughly 7% and 2.5%. Finally, average real balances declined in both the second and third periods.

Table 2: Summary statistics by period

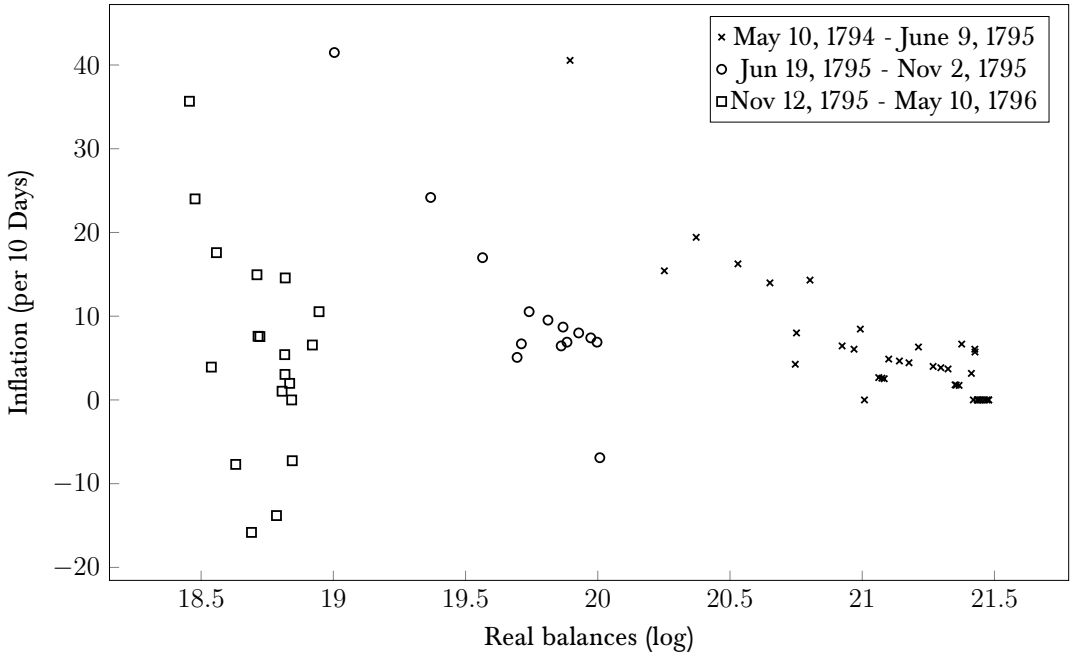
Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
			May 10 1794 to Jun 9, 1795		
$m_t - p_t$	39	21.16436	0.3283854	20.25182	21.47849
Δp_t	39	0.0459426	0.0510684	0	0.1941557
Δm_t	38	0.0148708	0.0109925	-0.0009499	0.0439205
			Jun 19, 1795 to Nov 2, 1795		
$m_t - p_t$	15	19.7546	0.2702003	19.00384	20.00775
Δp_t	15	0.1283528	0.1314703	-0.0689907	0.4149466
Δm_t	15	0.0451538	0.0132819	0.0277615	0.0813255
			Nov 12, 1795 to May 10, 1796		
$m_t - p_t$	21	18.67828	0.2225445	18.05509	18.94592
Δp_t	21	0.0712837	0.1265366	-0.1582222	0.3566732
Δm_t	22	0.0249206	0.0419196	-0.0224457	0.1548824

The effects of the structural breaks on the relationship between real balances and inflation can be seen visually. Figure 4 is a scatter plot of inflation and real balances broken down by the three periods.[34] The visual evidence confirms the existence of an inverse relationship between real balances and inflation until early November 1795. After that point, however, the relationship appears to have broken down as the quantity of real balances varied little, despite substantial fluctuations in the inflation rate during this period.

The estimated break dates correspond with fluctuations in the exchange rate between the *assignat* and international specie using daily data. As Figure 5 illustrates, the *assignat* depreci-

[34]See Figure 10 in Appendix D for a similar scatter plot of inflation and the growth rate of the *assignats*. Both figures exhibit roughly the same pattern.

Figure 4: Real Balances and Inflation by Period

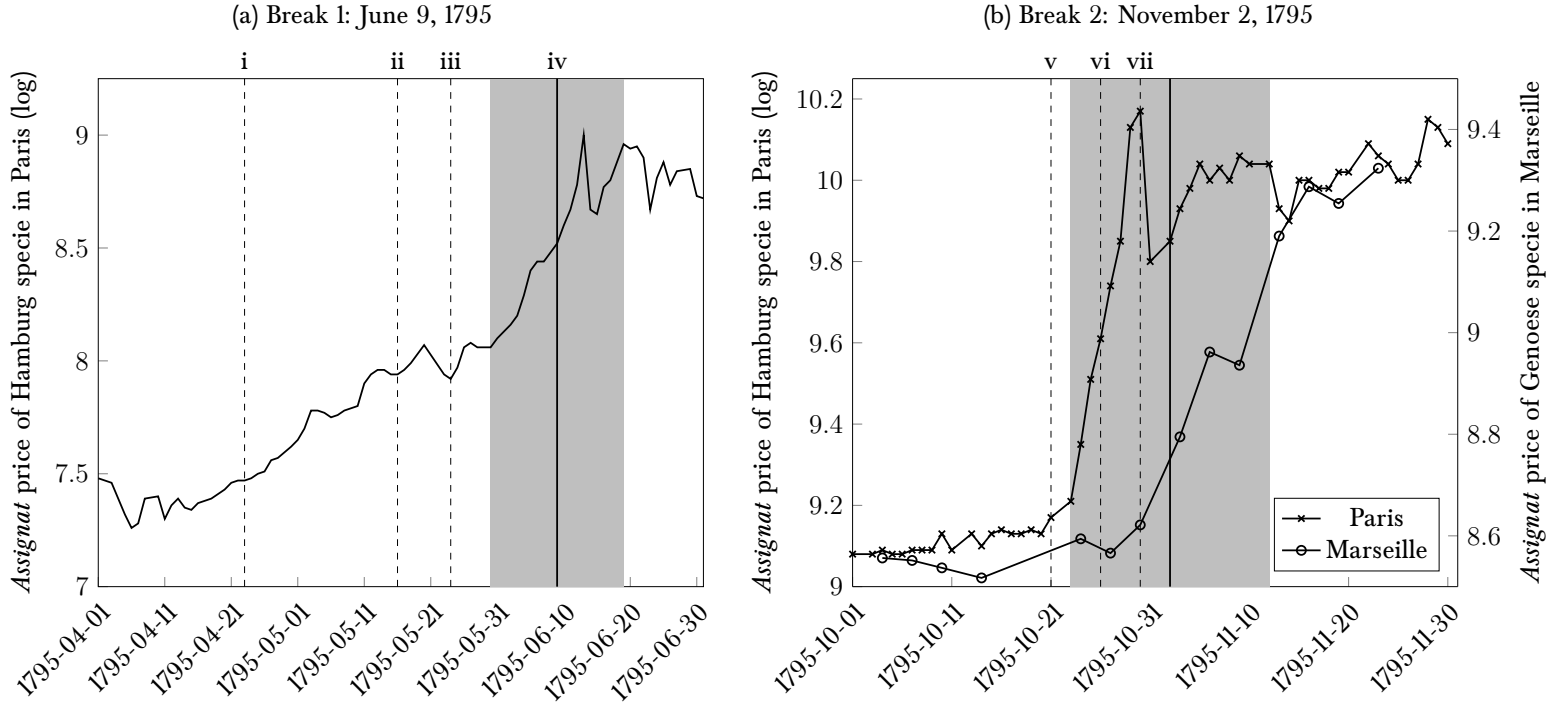


Sources: Caron (1909) and de Nogaret (1800)

ated substantially within our estimated confidence intervals. For the first structural break, the *assignat* depreciated by 148%, and in the case of the second, it depreciated by 130%. Note also that the depreciation of the *assignats* during the second structural break was more pronounced in Paris than in provincial towns such as Marseilles, which, given information costs, is what we should expect if the events generating the structural break originated in the capital.

Figure 5: *Assignat* Price of Specie

Notes: The solid vertical lines on each chart denote the estimated break dates and the gray areas illustrate their associated confidence intervals. The dashed lines denote important political events that affected the fiscal backing of the *assignat*: (i) Commission of the 11 created; (ii) Royal *assignats* demonetized; (iii) *Montagnard* insurrection; (iv) Restoration of property to the widows and heirs of victims of the Terror; (v) New legislative elected; (vi) End of Convention; (vii) New Congress in Session. See Table 7 in Appendix B for additional details. Note that the law restoring expropriated property was passed the same day as the first structural break in the relationship between real balances and inflation.

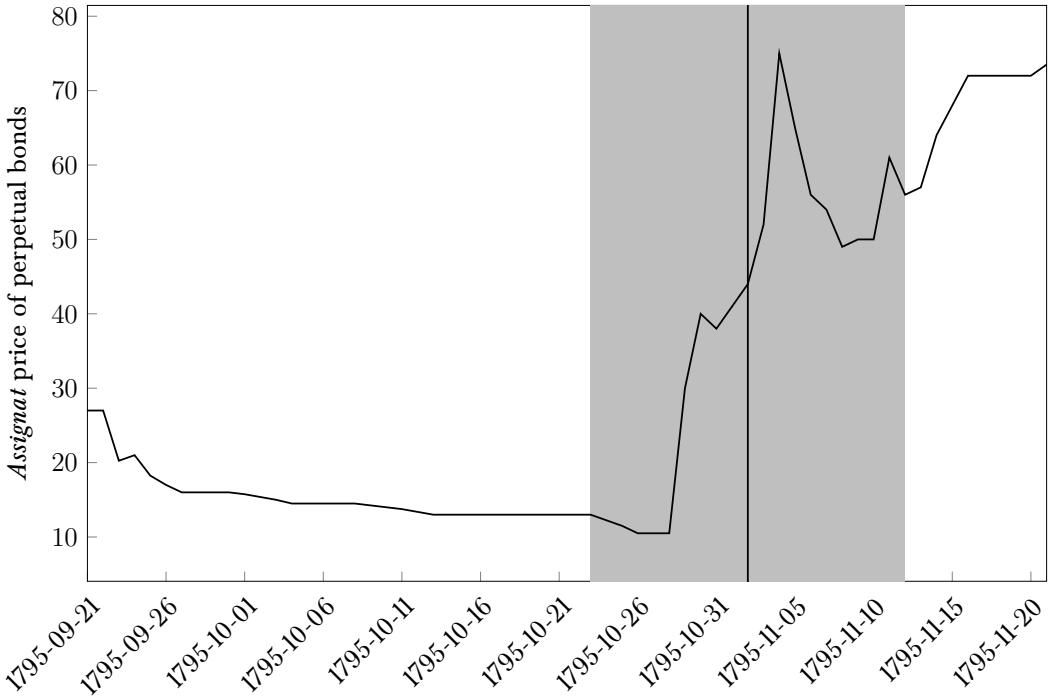


Sources: Bouchary (1937) and *Journal de Marseilles*.

Movements in the bond market also correspond with the second estimated break date of November 2, 1795. Figure 6 shows the market price for a perpetual bond yielding an annuity of 100 pounds.[35] The seven-fold increase in the nominal price of perpetual bonds between October 28 and November 4 is within our estimated confidence interval.

Figure 6: The Price of Perpetual Bonds and the Establishment of the Directory

Notes: The gray area illustrates the confidence interval estimated by our structural break tests. The vertical line reflects the estimated break date of November 2, 1795.



Source: Le Moniteur Universel

Evidence from the foreign exchange and bond markets suggests that the structural breaks correspond with radical changes in people's expectations vis-à-vis the government's policy towards the *assignat*. The substantial increase in the *assignat* price of international specie suggests that the events occurring around the time of the structural breaks weakened the fiscal backing of the *assignat*, resulting in lower demand for the revolutionary currency. Likewise, the increased price of perpetual bonds that corresponds with the second structural break points to a shift in

[35]Those *inscriptions* refer to the consolidation of the public debt in 1792, which led all the contracts of the creditors of the state into an inscription in a great book, which was called the "Great Book of the Public Debt." This reform transformed different claims into perpetual annuities yielding the same interest rate (Thiers, 1845).

bondholders' expectations about the probability of being repaid in specie. More specifically, it suggests that they expected the government to default on the *assignat* to repay the bondholders.[36]

As it happens, both structural breaks occurred around the same time as political events that weakened the fiscal backing of the *assignats*. The first structural break corresponds to the failed *Montagnard* insurrection at the end of May 1795 (see Appendix B for additional details). The *Jacobins* and their most radical members, the *Montagnards*, were the *assignats'* primary proponents in the Convention.[37] A riot on April 1, 1795, had already failed and weakened the *Montagnards*, some of whom were subsequently arrested. As the political influence of the *Jacobins* weakened, a "commission of the 11" was created to draft a new constitution.

The *Jacobins* nonetheless remained influential until the failure of their insurrection on May 20 to 23, 1795, and the disarmament of their members in Paris "could lead the way to a new politics" (Crouzet, 1993, p. 386) *vis-á-vis* finances and the *assignats*. This insurrection was far from benign. Indeed, it almost succeeded. The Parisian *sans-culottes* killed a member of parliament and presented his head on a spike to the president of the Convention. It took the government 3 days and 40,000 soldiers to disarm 60,000 Parisian rioters equipped with guns and canons and protected behind barricades.[38] One consequence of this failed insurrection was a weakening of the political support for the *assignats* and their fiscal backing.

Starting in February 1792, the revolutionaries had decided to seize the possessions of those emigrating "so as to ensure that the Nation receives the indemnity that is owed to it, for the extraordinary costs occasioned by the conduct of the émigrés." (Steinberg, 2019, p.68). These assets, called national assets of second origins, were part of the fiscal backing of the *assignats*,

[36] Calomiris (1988) has made a similar point regarding the Continental government's decision to default on the continental currency following the American Revolution to preserve the newly-formed government's credit in international bond markets. The French government ended up defaulting on two thirds of its debt in 1797 after a successful coup d'état in September of that year.

[37] The National Convention was the national legislature ruling France before the introduction of the Directory in November 1795. As Lefebvre (1964, p.107) writes: "Cambon, the Montagnards and the Thermidorians who had remained Republicans [...] repudiated [demonetization], so that it became the bone of contention between the parties, and *could not triumph until the Left had been finally crushed.*" [emphasis added].

[38] *Le Courrier Républicain*, n°565, May 23, 1795.

meaning that their sales led the government to retire *assignats* from circulation. During the Reign of Terror, the government added to these national assets by confiscating the properties of those government officials deemed counter-revolutionaries. This is what led d'Ivernois (1795, p.4-5) to argue that "Each assignat issued was then nothing but sort of bill of exchange drawn on the Revolutionary Tribunal, and paid by the Guillotine."

Soon after the *Montagnards*' loss of influence after the May 1795 insurrection, the Convention adopted a law regulating the restoration of property to the widows and heirs of victims of the Terror.[39] In the debates leading to that law, some parliamentarians warned against the destabilizing effects of this decision on the assignats. Suspending the sale of those national assets could easily be read as the first step in a repudiation of the fiscal backing of the *assignats*. This measure, Lecointre claimed, had already resulted in a sharp depreciation of the revolutionary currency: "If you take one retrogressive step in this matter, what will become of public trust? What will become of our finances? If you look back even once on the matter of these possessions, you will give the government an incalculable shock."[40]

Another member of the Convention, Pierre Guyomar was even more explicit: "Restoring the possessions of the condemned, this actually means a general amnesty. For, among the condemned, there are émigrés, there are squanderers of public funds. Shall we restore the property of the Duke of Orléans? Shall we restore to Robespierre, to Hanriot, to the conspiratorial commune of Lyon?"[41] The problem was that the restitution of national assets left the door open for subsequent reparations. Once the government started on this path, it was difficult for people to know exactly how secure buying national assets would be.

The failed *Montagnard* coup of May 1795 increased the prospects of a new constitution being enacted. As the Parisian police report on June 15, 1795, "what mainly occupies minds [...] is the expectation of the new government, whose mode must be soon proposed." (Aulard, 1899, p. 15). Yet one growing worry was that the government would default on the *assignats*. For instance, on

[39] The law was passed on June 9. *Le Moniteur Universel*, n°264, June 12, 1795.
[40] *Le Moniteur Universel*, n°85, December 15, 1794.
[41] *Le Moniteur Universel*, n°226, May 5, 1795.

June 17, 1795, a police report reads: "Dufresnoy says he heard several individuals say they were not surprised at the loss the *assignats*, since during the course of next month France was to have a chief, and bankruptcy would be declared" (Aulard, 1899, p. 20). Similarly, On June 13, 1795, a police agent reports that he heard in a coffee shop that "the project of the Convention was to demonetize the *assignats* of ten thousand and five hundred pounds and that people added that several members of parliament did not hesitate to say in their societies that there was no other way to bring in seven or eight billion of *assignats* on the fifteen which are circulating." (Aulard, 1899, p. 12).

The second structural break we identified corresponds with the establishment of the Directory. This break can be explained by both the weakening of the *Jacobin* left, which strongly opposed the demonetization of the *assignats* (Lefebvre, 1977, p. 104), and by the political success of the Royalists in the elections of October 1795.[42] As long as the *Jacobins* remained a major political force, demonetization was out of the question. The Directorial regime, on the other hand, was eager to return to a metallic currency, even if it was at the expense of *assignats* holders. The new lower chamber, the *Conseil des Cinq-Cents*, was not as committed to avoiding a de facto default on the *assignats* (Levasseur, 1903, p. 126). On the other hand, the political successes of the Royalists, who won well over 50% of the one-third of seats subject to regular elections, increased the prospects that national assets of second origins —and maybe even those of the clergy— would be returned. As before, this meant a weakening of the fiscal backing of the *assignats*.

The successful establishment of the Directory was far from certain, even in the first days of its existence. As Director de La Révelliére-Lépeaux (1895, pp. 257-263) explains in his memoirs, an attempted coup by the monarchists gave some *Jacobins* an excuse to stop the establishment of the Directory and to reestablish the Revolutionary government. A secret agent reports that on October 24, two days before the official start of the Directorial regime, some people in Paris "manifested the fear that the work of the Convention would continue beyond the

[42] Appendix C presents evidence from parliamentary debates that suggests the establishment of the Directory did in fact weaken the political Left, and thus made demonetization more likely.

5th of this month [Brumaire], which would further delay the organization of the constitutional government." (Aulard, 1899, p. 335). During the Convention's last weeks, leading politicians worried that skyrocketing inflation would lead to a coup where their heads could quite literally be lost. The president of the Committee of Public Safety, Cambacérès, declared during a session of the Committee of Public Safety that if inflation continues "well, we run the risk of being hooked to the lantern."[43] "Assignat or death" was not simply a rhetorical trick; it was a grim possibility for those politicians.

Even after the official start of the regime, the threat of a *Jacobin* coup remained acute (Lefebvre, 1977), and Director de La Révelliére-Lépeaux (1895) remembered being seized with "mortal anguish" during the first few days of the Directory. The remaining *Jacobins* in the Directorial Congress, such as Dubois-Crancé or Lindet, fiercely defended the interests of the bearers of *assignats* by opposing their demonetization (Crouzet, 1993; Lefebvre, 1977; Antonetti, 2007). Yet their influence was now too limited to determine the course of monetary policy, and the Directors "were decided to abandon the assignats" (Crouzet, 1993, p. 399). The attitude of the new regime toward the *assignats* can be best summarized by the following exchange, on October 25, 1795, one day before the end of the Convention, between Rewbell, future Director, i.e., a member of the executive branch in the Directory, and left-wing politicians in the parliament:

> *Rewbell.* [...] your system of assignats is so bad that it can no longer continue. (whispers).
>
> *Vallée.* Are we here organizing the counter-revolution? (whispers on the left).
>
> (*Le Moniteur Universel*, n°42, November 4, 1795)

On October 31, 1795, one day after the Directorial Congress was constituted, the *Conseil des Cinq-Cents* immediately ordered a report to be written on how to reform monetary affairs. The report, directed by Eschassériaux, was presented in front of the parliament on November 13, 1795. Eschassériaux' project was to limit the ability of the government to inflate the currency. He asked for the quantity of *assignats* to be made public (T1, art.1), to limit the total supply of

[43] During the Revolution, mobs used lamp posts for improvised lynchings and executions in Paris.

assignats permanently to 30 billion pounds (T1, art. 3), to break the printing press on January 5th, 1796 (T.1, art.2) and to convert the *assignats* into what would have been devalued bonds (T.2, art.1). Eschassériaux also complained that the depreciation of the *assignats* "made tax revenue almost null." Hence, Eschassériaux' commission proposed to fix taxes in gold and accept either gold or *assignats* at its market price to pay them.[44]

Eschassériaux' plan to go back to metallic currency was tantamount to a de facto default on the *assignats*, which would have lost their legal tender status. The left of the political spectrum fought back. Dubois-Crancé argued the choice was between "assignats or death," while Lindet argued that demonetization was no different from bankruptcy.[45] Although the *Conseil des Anciens* voted against Eschassériaux' plan on December 5, the worry that the *assignats* would soon be demonetized became pervasive. On November 13th, 1795, a secret agent reports people "fear that the assignats will be demonetized" (Aulard, 1899, p. 382). Similarly, on November 15th, 1795, another police report claims that some people "pretend that assignats of less than 100 pounds are going to be demonetized" (Aulard, 1899, p. 388), and another, the same day, warns that the public sees the *assignats* "annihilation as proximate" (Aulard, 1899, p. 389).

5.2 Stationarity and cointegration tests

Recall from Section 3 that the necessary conditions for the applicability of the Cagan model of money demand during hyperinflation require real balances and inflation to both be $I(1)$ and cointegrated. To test whether each series is stationary we applied augmented Dickey-Fuller tests to the entire sample as well as to each period identified by the structural break tests. In the case of the full sample, the two series are integrated of different orders and thus cannot be cointegrated. In the case of the first period, each series is $I(2)$, while in the second, they are integrated of different orders. Finally, both series are $I(0)$.[46]

While real balances and inflation fail to meet the necessary conditions for the applicability

[44] *Le Moniteur Universel*, November 24 1795, n6, p.51

[45] Thomas Lindet was one major politician on the left who relentlessly defended the *assignats*. Lindet (1795) accuses his colleagues of having discredited the *assignats* by weakening their commitment toward them.

[46] Results for the discussion in this paragraph are available upon request.

of the Cagan model for the first and second periods individually, the two series are $I(1)$ when we combine the first and second periods. Table 3 reports the results of the augmented Dickey-Fuller tests. Given the existence of a structural break in the combined sample, we used the cointegration tests proposed by Gregory et al. (1996), which accounts for the existence of a single structural break and provides an estimated break date. Table 4 reports our results. We find that real balances and inflation are cointegrated across the first and second periods despite the existence of a structural break. Moreover, our results corroborate the break dates identified by the Bai & Perron (1998, 2003) structural break test (see Table 1).

Table 3: Unit Root Tests

Notes: We estimated these test statistics using the augmented Dickey-Fuller test. To account autocorrelation in the residual, we used the Akaike Information Criterion to select the appropriate lag for each variable. Lags are reported in brackets.

Variable	Test Statistic	Order of Integration
	May 10, 1794-Oct 23, 1795	
$m_t - p_t$	-3.043*** {1}	I(1)
Δp_t	-4.385*** {3}	I(1)
	May 10, 1794-Oct 13, 1795	
$m_t - p_t$	-3.322** {1}	I(1)
Δm_t	-5.283*** {1}	I(1)
*** p<0.01, ** p<0.05, * p<0.1		

We conducted similar tests on the growth rate of the *assignats* to determine whether changes in the price level were being driven by fundamentals, i.e., changes in the growth rate of the assignat or self-fulfilling expectations. As before, we found that the two series were integrated of different orders over the entire period and during the first and second periods individually. Likewise, while we found that real balances and the growth rate of the *assignats* are first difference stationary, the two series are not cointegrated.[47] Combining the first and second periods, however, overcomes these issues as it did before. During the first and second periods together, both real balances and the growth rate of the *assignats* are $I(1)$ and cointegrated (see Tables 3 and 4). In this case, the break date is just over a month later than that identified by the

[47] Results available upon request.

Bai & Perron (1998, 2003) test. Nonetheless, these results rule out the possibility of a rational bubble in the price level and permit us to estimate the relationship between real balances and the growth rate of the *assignats*.

Table 4: Cointegration tests in the presence of a single structural break

Notes: Test statistics reflect the existence of a structural break in both the constant and the slope for both relationships. For all three series, the sample runs from May 10, 1794 to October 23, 1795.

Relationship Tested	Test Type	Test Statistic	Estimated Break Date
$m_t - p_t$ and Δp_t	ADF	-4.81*	June 19, 1795
	Z_t	-6.97***	June 9, 1795
	Z_a	-51.16**	June 9, 1795
$m_t - p_t$ and Δm_t	ADF	-4.69*	July 9, 1795
	Z_t	-4.74**	July 9, 1795
	Z_a	-32.33	July 9, 1795
*** p<0.01, ** p<0.05, * p<0.1			

5.3 Estimating demand for the *assignats*

We now turn to estimate Equation 5 using three different estimation procedures. The first procedure is an ordinary least squares (OLS) regression with the inclusion of a dummy variable that we set to 1 for all observations after June 9, 1795.[48] Table 5 reports the results of this regression. Our estimate of the semi-elasticity parameter has the right sign, is statistically significant at the 1% level, and implies a seigniorage-maximizing rate of 25.51% per 10 days. The constant term is also statistically significant at the 1% level, which, together with our estimate of the semi-elasticity parameter, implies a maximum annual seigniorage revenue of 6.4 billion pounds before the structural break in early June 1795.[49] The coefficient on the dummy variable

[48] See Taylor (1991) for a detailed explanation of the conditions under which OLS can be used to estimate a Cagan-style money demand function.

[49] The seigniorage maximizing rate of inflation that can be sustained in the steady state depends solely on the semi-elasticity parameter, while the maximum amount of annual seigniorage revenue that can be sustained in the steady state depends on the semi-elasticity parameter and the constant term. In the case of the Cagan (1956) model, it can be shown that the seigniorage-maximizing rate of inflation occurs where $\Delta p_t = \frac{1}{\alpha}$, where α is the semi-elasticity parameter. It can also be shown that the maximum amount of seigniorage revenue that can be collected in the steady state is equal to $\frac{e^{\psi}}{\alpha e}$, where e is the exponential function, ψ is the constant term, and α is the semi-elasticity parameter.

for the structural break on June 9, 1795, is negative and statistically significant at the 1% level, confirming our conjecture that the political upheaval in early June 1795 weakened the fiscal backing of the *assignats*. Our results indicate that the events surrounding the structural break caused real balances to decrease by roughly 70%, reducing the maximum annual seigniorage revenue that could be sustained from 6.4 billion to 1.9 billion pounds (in specie).[50]

The estimates of the maximum annual seignorage revenue using OLS seem unrealistic as Toutain's (1987) GDP estimate for the 1781-1790 decade is equal to 5,941 million pounds. For comparison, in the midst of a war against Europe, the French government spent 914 million pounds (in specie) in 1792 and 1.33 billion in 1793 before spending decreased back to 922 million in 1794 (Rouanet, 2021).

Table 5: Estimating the demand for *assignats* using the inflation rate

Notes: The constant and slope coefficient estimates obtained from the dynamic ordinary least squares (DOLS) regression assume four leads and lags. We obtained similar parameter estimates using alternative leads and lags. Our results are available upon request. The standard errors associated with our OLS and DOLS estimates are corrected for fourth and first order autocorrelation in the residual, respectively, and computed using the Newey-West estimate of the error variance. The constant and slope coefficient estimates obtained using the vector error correction model (VECM) assume 2 lags. Parameter estimates derived from alternative lag structures are available upon request.

	May 10, 1794-Oct 23, 1795			*Nov 2, 1795-May 10, 1796*
	OLS	DOLS	VECM	OLS
Inflation	-3.919291***	-7.036752***	19.13034***	-0.1389263
	(0.4233593)	(0.574049)	(1.799605)	(0.3571366)
Structural Break (June 9, 1795)	-1.213284***	-0.9629303***	0.9008267***	-
	(0.0662395)	(0.0667706)	(0.0739032)	(-)
Constant	21.34792***	21.47754***	-21.76491	18.75722***
	(0.0581627)	(0.0331571)	(-)	(0.0279619)
Observations	53	48	51	20
R-squared	0.9267	0.9807	-	0.0178
Seigniorage-Maximizing Inflation Rate (per 10 days)	25.51%	14.21%	5.23%	-
Maximum Annual Revenue before June 9, 1795	6.4 billion	4.06 billion	1.99 billion	-
Maximum Annual Revenue after June 9, 1795	1.9 billion	1.55 billion	0.81 billion	-
*** p<0.01, ** p<0.05, * p<0.1				

While our estimate of the semi-elasticity parameter is super consistent using OLS in the sense of Stock (1987), inflation is unlikely to be strictly exogenous. To account for this possibility, we use the dynamic ordinary least squares (DOLS) approach proposed by Stock & Watson

[50]The coefficient estimate on the dummy variable can be converted into a percent change using the following formula: $100 \times (e^x - 1)$, where x is the coefficient estimate on the dummy variable.

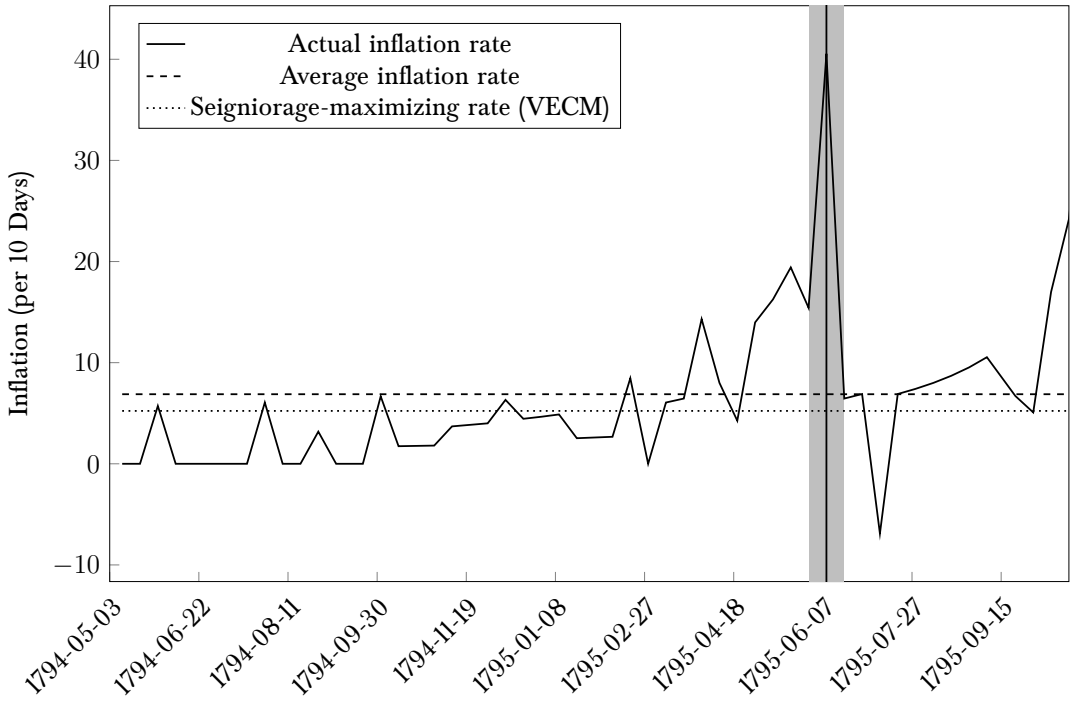
(1993) to generate a lags and leads estimator of the semi-elasticity parameter.[51] Table 5 reports the results of this regression. As before, the semi-elasticity parameter has the right sign and is statistically significant at the 1% level. However, the estimate is smaller than that yielded by OLS, implying a lower seigniorage-maximizing inflation rate of 14.21% per 10 days. The constant term is again statistically significant at the 1% level, and, when combined with the semi-elasticity estimate, implies a maximum annual seigniorage revenue of 4.06 billion pounds —roughly around two-thirds of GDP— before the first structural break. The coefficient estimate on our dummy variable continues to be negative and statistically significant at the 1% level. The estimate implies that the events surrounding the structural break caused real balances to decline by nearly 62%, and, in consequence, the maximum amount of annual seigniorage that could be collected fell to 1.55 billion pounds, or around 26% of GDP.

For the third procedure, we used a vector error correction model (VECM) to estimate *assignat* demand. The results, which we report in Table 5, are consistent with what we found using OLS and DOLS, although the estimate of the semi-elasticity parameter is much larger when using the VECM, implying a seigniorage-maximizing rate of inflation of 5.23% per 10 days. The VECM results indicate that before the first structural break, the maximum annual seigniorage that could be raised was roughly 2 billion pounds —33% of GDP, and fell to 0.81 billion pounds after the structural break owing to the roughly 60% decline in real balances. This estimate is consistent with the growing worry after June 1795 that issuing *assignats* could no longer cover current government expenses. Indeed, 0.81 billion was less than real government spending during the previous year, 1794. Since the VECM provides the largest of the three semi-elasticity estimates, we plot the seigniorage-maximizing rate of inflation implied by the estimated semi-elasticity parameter along with average and actual inflation over this period in Figure 7. The figure illustrates that actual inflation was generally below the seigniorage-maximizing rate until the early spring of 1795. However, average inflation over the entire period exceeds our estimates of the seigniorage-maximizing rate, suggesting that the government may have been on the wrong

[51] Ireland (2009) used this approach to estimate the demand for money under normal conditions, and Pittaluga et al. (2020) have used it to do the same during periods of high inflation.

side of the seigniorage Laffer (or rather "Bailey" (1956)) curve.

Figure 7: Inflation and the Seigniorage Maximizing Inflation Rate



Finally, while the final period following the establishment of the Directory failed our cointegration tests, we did regress real balances on inflation to show that there is no relationship between the two series during this period. We report these results in the final column of Table 5. Consistent with both the visual evidence from Figure 4 and our cointegration tests, we find no evidence of a relationship between real balances and inflation after the second structural break on November 2, 1795, suggesting a total lack of liquidity demand for the *assignats* after that point.

In the absence of rational bubbles, the growth rate of the money supply determines the inflation rate one-for-one in stationary equilibrium. Under such conditions, regressing real balances on the inflation rate and the growth rate of the money supply should yield the same estimates.[52] To determine the extent to which this implication holds, we use the same procedures as before,

[52]This approach has been used by Engsted (1993, 1998) to determine whether price-level movements were being driven by changes in the money supply or by self-fulfilling expectations. Other approaches have been used to answer the same question. See, for example, Funke et al. (1994).

Table 6: Estimating the demand for *assignats* using the growth rate of the *assignats*

Notes: The constant and slope coefficient estimates obtained from the dynamic ordinary least squares (DOLS) regression assume four leads and lags. We obtained similar parameter estimates using alternative leads and lags. Our results are available upon request. The standard errors associated with our OLS and DOLS estimates are corrected for third order autocorrelation in the residual and computed using the Newey-West estimate of the error variance. The constant and slope coefficient estimates obtained using the vector error correction model (VECM) assume 3 lags. Parameter estimates derived from alternative lag structures are available upon request.

	May 10, 1794-Oct 13, 1795			*Oct 23, 1795-May 10, 1796*
	OLS	DOLS	VECM	OLS
Growth Rate of the *Assignats*	-15.45181***	-21.01543***	14.15107***	1.394312
	(5.898003)	(3.927253)	(2.060651)	(1.02202)
Structural Break (May 30, 1795)	-0.8532434***	-0.7839018***	1.054457***	-
	(0.2050804)	(0.180741)	(0.0840985)	(-)
Constant	21.38587***	21.51889***	-21.51958	18.73193***
	(0.0920606)	(0.0612071)	(-)	(0.0553138)
Observations	51	46	48	21
R-squared	0.8778	0.9735	-	0.0813
Seigniorage-Maximizing Growth Rate (per 10 days)	6.47%	4.76%	7.06%	-
Maximum Annual Revenue (1st period)	1.69 billion	1.42 billion	2.10 billion	-
Maximum Annual Revenue (2nd period)	0.70 billion	0.63 billion	0.71 billion	-
*** p<0.01, ** p<0.05, * p<0.1				

using the growth rate of the *assignats* as the dependent variable. Table 6 reports our results. The parameter estimates on the growth rate of the *assignats* using OLS and DOLS are much larger than those we found using inflation as the dependent variable. Nonetheless, the estimates have the right sign, are statistically significant at the 1% level, and are close in magnitude to our VECM estimates. Likewise, the coefficients on the dummy variable are statistically significant at the 1% level and are negative, indicating that the weakening of the *assignat's* fiscal backing reduced *assignat* demand. The parameter estimate produced by the VECM is statistically significant at the 1% level and somewhat less than what we estimated using inflation as the independent variable. The results again indicate a negative money demand shock occurring at the structural break. Finally, as before, we regressed real balances on the growth rate of the *assignats* during the third period and again found no evidence of a relationship between the two series.[53] Overall, the results in Table 6 suggest that printing *assignats* may no longer have been sufficient to finance government spending.

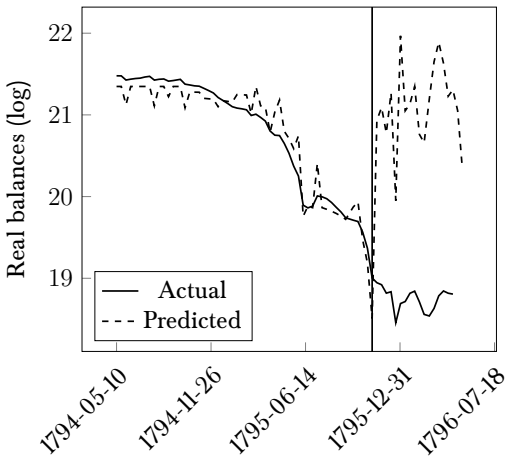
While data limitations prevent us from estimating the effect that the second structural break

[53]See Figure 10 in Appendix D for a scatter plot of real balances and the growth rate of the *assignats*. Similar to 4, there is no discernible relationship between the two series during the third period.

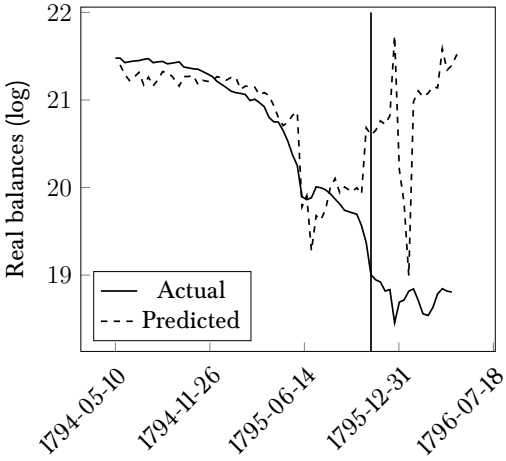
Figure 8: Predicted versus Actual Values of Real Balances

Notes: The solid vertical lines on each chart denote the second structural break on November 2, 1795.

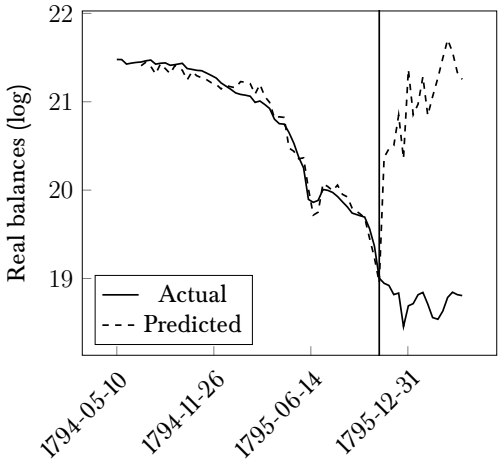
(a) Dependent Variable: Δp_t (OLS)



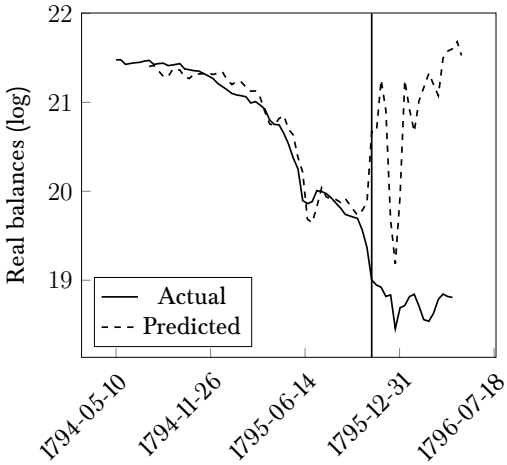
(b) Dependent Variable: Δm_t (OLS)



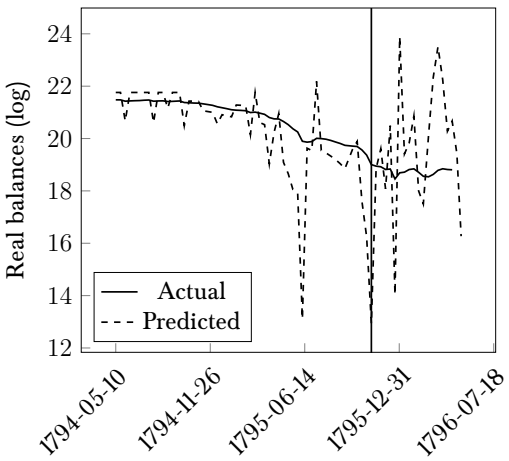
(c) Dependent Variable: Δp_t (DOLS)



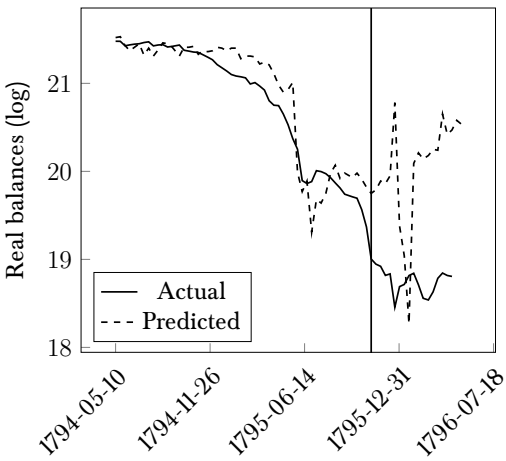
(d) Dependent Variable: Δm_t (DOLS)



(e) Dependent Variable: Δp_t (VECM)



(f) Dependent Variable Δm_t (VECM)



had on the demand for *assignats*, we can illustrate the magnitude of this effect by constructing a simple hypothetical "counterfactual." To do so, we use the actual inflation rate and growth rate of the *assignats* during the third period and the parameter estimates derived from our empirical analysis to illustrate how real balances would have responded to the actual rates of inflation and money supply growth during the final period. Figure 8 illustrates the difference between the actual path of real balances with the paths implied by our estimates.

The OLS and DOLS results illustrate that our estimates closely track the actual path of real balances before the third period, and then diverged substantially after the establishment of the Directory. This divergence suggests that the impending demonetization of the *assignats* resulted in a large decrease in real balances. The VECM results are less clear, especially when using the inflation rate. This evidence should be interpreted with caution as it assumes the inflation and money supply process would have remained constant across regimes, which is extremely unlikely. Nonetheless, the visual evidence presented in Figure 8 does provide some sense of how the establishment of the Directory affected the demand for *assignats*.

6 Conclusion

For over 200 years, scholars have used the *assignat* hyperinflation to advance our understanding of monetary theory. We have contributed to these efforts by examining the political factors that influenced the fiscal backing of the *assignats* and, thus, the demand for the revolutionary currency. We identified two structural breaks that correspond with the weakening of the *Jacobin* left's control of parliament and the establishment of the Directorial regime. Our results indicate that the failed *Montagnard* insurrection in the spring of 1795 decreased *assignat* demand by up to 70%, decimating the inflationary tax base. In consequence, the maximum amount of seigniorage revenue the *assignat* could produce fell precipitously.

Our results also indicate that the Directory's decision to demonetize the *assignats* caused the relationship between real balances and inflation to breakdown altogether. The hypothetical

counterfactual we constructed using our estimated money demand function for the first two periods suggests that real balances would have been higher, and the *assignat* price of specie lower under the Directorial regime had the revolutionary currency not been demonetized. Finally, our findings are robust with respect to the choice of estimation procedure, and when using the growth rate of the *assignats* instead of the inflation rate as the independent variable—the latter indicating that movements in the quantity of real balances and the price level were not driven by self-fulfilling expectations.

As we see the matter, scholars studying inflationary finance need to incorporate the importance that politics plays not only in the money supply process, but also the effect that political considerations have on the fiscal backing of rapidly depreciating currencies. The shifting political equilibrium in revolutionary France weakened the government's commitment to remove the *assignats* from circulation, which had significant effects on the demand for the revolutionary currency, and thus the base of the inflation tax. Since reliance on inflationary finance and political instability often go hand-in-hand, consideration of this stability on the demand for money seems to us to be in order. Failing to account for it is likely to result in an incomplete understanding of the dynamics of hyperinflation.

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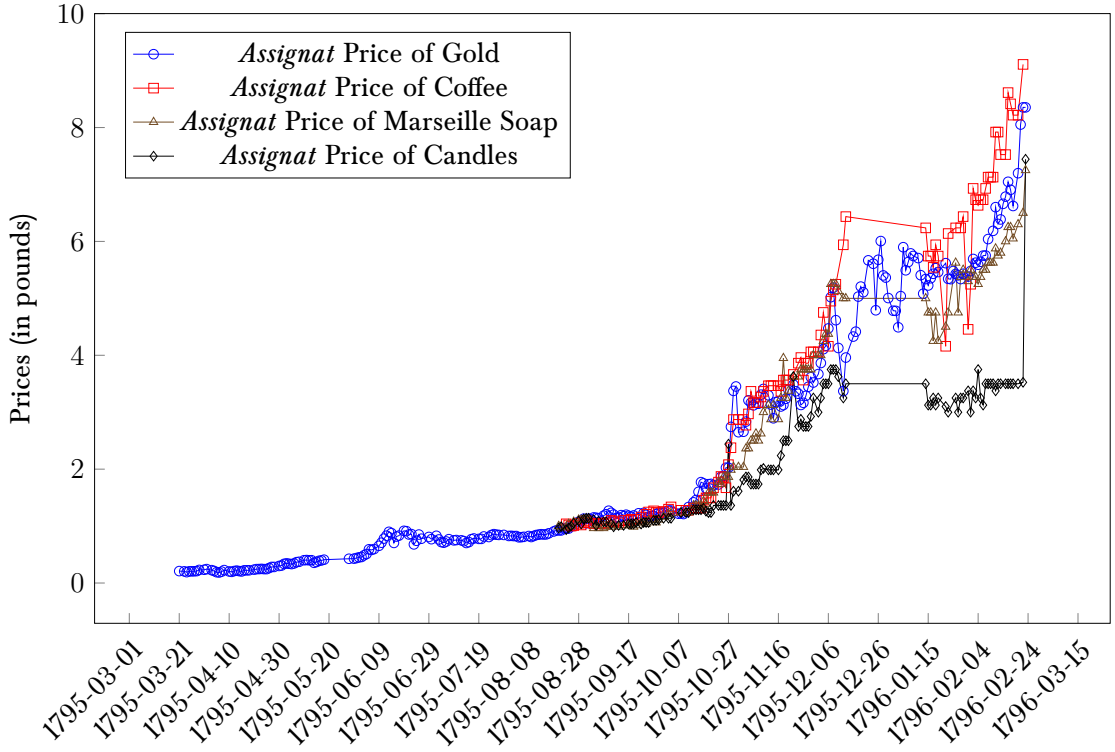
A Price of gold relative to other commodity prices

Figure 9: *Assignat* Price of gold relative to other commodities

Note: Index=1 on August 25, 1795.



B Timeline

Date	Date index	Distance from nearest break	Economic regulations	Military events	Constitutional and political changes
June 10, 1794	5	-36	"Laws of Prairial" reinforcing the Terror.		
July 28, 1794	9	-32			Fall of Robespierre.
October 7, 1794	16	-25			Proproposition in front of the Assembly for the return of 73 *Girondins*.
November 4, 1794	20	-21		French general Kléber receives the capitulation of Maastricht.	
November 9, 1794	20	-21	The Maximum for grain is increased to 2/3 the 1790 prices. The use of forced sales of grain (Réquisitions) are restricted.		
November 22, 1794	21	-20			The Jacobin's club is closed.
December 24, 1794	24	-17	Abolition of the Maximum.		
January 2, 1795	25	-16	The Convention abolishes the interdiction to export metallic currency.		
January 20, 1795	26	-15		The French army occupies Amsterdam.	
April 23, 1795	36	-5			The Convention creates a commission composed of 11 parliamentarians to discuss Constitutional reform.

April 25, 1795	36	-5	Selling and buying metalic currency is legalized and stock exchanges are re-opened.		
May 16, 1795	38	-3	Demonetization of the Royal Assignats.		
May 21, 1795	39	-2	Metallic currency is once again forbidden (decree of April 5 is repealed).		
May 20 to 24, 1795	39	-2			Major montagnard insurection which lasted 4 days and ended up with the defeat of the insurgents.
June 9, 1795	41	0	**FIRST STRUCTURAL BREAK**		
June 14, 1795	41	0			Parlamentarians who were involved in the attempted coup of Prairial (May 20 to 24) are executed.
June 17, 1795	41	0	Reubell in the name of the Comittee of public safety proposes to index tax payments to the amount of *assignats* issued.		
June 21, 1795	42	1	Taxes and payments are indexed on the amount of *assignats* issued.		
June 23, 1795	42	1		Landing of royalist forces in Quiberon leading to their resounding defeat.	Boissy d'Anglas proposes to the assembly the preliminary project fo the Constitution of Year III.
July 1, 1795	43	2		Annexation of Belgium to France.	
July 20, 1795	45	4	The *Contribution foncière* must be paid half in grain.		

July 22, 1795	45	4		Paix de Bale - Peace with Spain.	
August 30, 1795	49	-6	Selling and buying mettalic currency is legalized definitely.		
September 6, 1795	49	-6			The new Constitution is adopted by plebiscite.
October 5, 1795	52	-3			Royalist insurection in Paris.
October 12 to 21, 1795	53	-2			Election of the first legislature of the Directory. 2/3 of the legislature was composed of members of the Convention. The Royalists won the majority of the remaining 1/3 of seats.
October 26, 1795	54	-1			The Directorial regime is officially instituted.
October 30, 1795	54	-1			The two chambers of the new regime's parliament are in session for the first time.
November 1, 1795	54	-1			The first Director (i.e. the first member of the executive branch) is nominated.
November 5, 1795	54	-1			The executive branch (the Directory) declares to Congress it is finally fully established.
November 12, 1795	55	0	**SECOND STRUCTURAL BREAK**		
December 10, 1795	58	3	The parliament votes in favor of a 600 million forced loan. The loan is a total failure.		
December 23, 1795	60	5	The *Conseil des 500* decides that the printing press will be destroyed once the total value of the *assignats* printed reaches 40 billion pounds.		

February 19, 1796	65	10	The printing press is publicly destroyed.		
March 19, 1796	68	13	Creation of a new paper money, The *Mandats*.		
May 23, 1796	75	20	Assignats above 100 pounds stop to be legal tender after the end of June.		

C The Directory and the shift in the political equilibrium

Given the absence of organized political parties during the French Revolution, it is difficult to gather a clear picture of the political landscape. We know very little of many parliamentarians during that period and even less so when it comes to their policy and ideological stances. A large fraction of members of parliament did not partake in any discussions. On the other hand, we know a lot more about those who spoke in front of the parliament.

To measure the change in the political equilibrium between the Convention and the Directory around our second structural break (November 2, 1795), we collected data about 238 parliamentarians intervening more than 1,800 times in front of the assembly between September 23, 1795 and December 20, 1795.[54] We used the transcription of the parliamentary debates in *Le Moniteur Universel* which gives the name of those who spoke. We then cross-referenced these names with that in the "base de données des députés francais depuis 1789."[55] The database gives the political affiliation of members of the Convention and *Conseil des 500* —the lower house during the Directory. The political groups in both chambers, however, have different names (see table 8), which makes it difficult to make comparisons across chambers.

Table 8: Correspondance between the political groups of the *Convention* and *Conseil des 500*.

		Conseil des 500.						
		Royalist	Clichyiens	Right	Moderate	Majority	Left	**Total**
Convention	Right/Minority	2	3	2	0	0	0	**7**
	Plaine	0	1	1	2	0	0	**4**
	Center Right	0	0	0	1	0	0	**1**
	Girondins	0	1	3	12	0	2	**18**
	Moderate	1	1	5	25	0	1	**33**
	Center	0	0	0	1	0	0	**1**
	Center Left	0	0	0	3	0	1	**4**
	Left	0	0	0	2	3	13	**18**
	Montagne	0	0	0	1	4	12	**17**
	Total	**1**	***5***	**11**	**48**	**7**	**29**	**101**

We used two methods to better compare the change in politics during that period. The first consist in directly using what was used to describe the political affiliation of each parliamentarian to assign them to three broad groups: the Right, the Moderates and the Left.[56] One problem with that method is that there are a substential number of speakers in the *Conseil des 500* for which we do not know their political affiliation other than the group they belonged to in the

[54] The choice of those days means that that we collect data for the 4 revolutionary weeks immediately before and after the structural break.

[55] https://www2.assemblee-nationale.fr/sycomore/recherche.

[56] The classification for each legislature is as follows. In the Convention — Right: "Droite," "Minority." Moderate: "Centre," "Centre Droit," "Centre Gauche," "Girondins," "Modérés," "Plaine." Left: "Gauche," "Montagne," "Thermidoriens," "Majorité." In the Council of 500 — Right: "Royaliste," "Clichyiens," "Droite." Moderate: "Modérés." Left: "Gauche," "Majorité."

Convention. An additional worry is that what is considered as the "left" or the "right" differed between both legislature.

To estimate political affiliations more robustly, we use the correspondence in political affiliation for those who sat both in the Convention and the *Conseil des 500* (Table 8). For each political group in the *Conseil des 500*, we create a variable equal to 1 if we have information a member belongs to it and 0 otherwise. For members where this information is missing, either because they did not seat in the *Conseil* or because it was not given in the database, we use their political affiliation in the Convention. These members are then assigned a number between 0 and 1 for each variable associated to a group in the *Conseil*. This number corresponds to the probability that a member of a group in the Convention becomes the member of a given group in the *Conseil*. For instance members of the "Plaine" in the Convention are considered 25% "Clichyiens," 25% from the Right and 50% Moderate (Table 8).

Table 9 reports the results. Both our methods used suggest that the Left was weakened, and the Right strengthened, with the introduction of the Directory. The results hold whether we count the characteristics of those who spoke at least once in front of the legislature or if we count the number of times members of each political group took the floor.

Table 9: The change in political equilibrium using parliamentary debates.

	Right		Moderate		Left		**Total**	Not identified
	Number of speakers							
Convention	3	1.9%	75	49.3%	74	48.7%	**152**	11
Conseil des 500	21	24.1%	42	48.3%	24	27.6%	**87**	26
Convention (estimate)	20.4	13.5%	58.0	38.2%	73.5	48.4%	**152**	11
Conseil des 500 (estimate)	22.1	20.2%	49.0	44.9%	37.9	34.8%	**109**	8
	Number of interventions							
Convention	4	0.5%	349	42.0%	477	57.5%	**830**	40
Conseil des 500	95	21.8%	183	42.1%	157	36.1%	**435**	204
Convention (estimate)	78.8	9.5%	285.5	34.4%	465.7	56.1%	**830**	40
Conseil des 500 (estimate)	102.4	17.2%	233.2	39.3%	258.4	43.5%	**594**	45

Finally, our results likely overestimate the political representation of the Left in the *Conseil des 500* compared to that in the Convention for three reasons. First, the speakers whose political affiliation was not identified are more likely to be moderate or right wing. Second, many of the members who qualified as part of the left in the Convention became sensibly more moderate with the advent of the Directory. Finally, the *Conseil des Anciens* —the upper house— was more conservative than the *Conseil des 500*.

D Scatterplot using the growth of the money supply

Figure 10: Scatterplot of real balances and growth Rate of the *assignat*