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Modeling Monopoly Money:
Government as the Source of the Price Level and Unemployment

by

Sam Levey*
University of Missouri–Kansas City

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Levy Economics Institute
P.O. Box 5000
Annandale-on-Hudson, NY 12504-5000
http://www.levyinstitute.org

ABSTRACT

Many of the claims put forth by Modern Monetary Theory (MMT) center around the state's monopoly over its own currency. In this paper I interrogate the plausibility of two claims: 1) MMT's theory of the price level—that the price level is a function of prices paid by government when it spends—and 2) the claim that the cause of deficient effective demand is the state's failure to supply government liabilities so as to meet the demand for net financial assets. I do so by building a model of "monopoly money" capable of producing these two outcomes.

KEYWORDS: Modern Monetary Theory; Price Level; Monopoly Money; Durapoly; Deficient Effective Demand

JEL CLASSIFICATIONS: E4, E62, B52, D42

1   INTRODUCTION

Modern Monetary Theory (MMT) is a heterodox school of macroeconomics that carries on in the tradition of Post-Keynesian Institutionalism, continuing the line from Karl Marx, Thorstein Veblen, and John Maynard Keynes (Wray 2012), along with independent development by Warren Mosler. Among other things, MMT's point of entry heavily emphasizes that the state issues its own currency under conditions of monopoly, and that this currency is the only thing that can be used to discharge taxes and other obligations to the state.

The basic paradigm of mainstream macroeconomics builds from general equilibrium (GE) theory and real business cycle (RBC) theory. In their basic form, neither of these conceptions have much room for either money or the state, and even in models that do have money, the state's monopoly on its own currency is not taken seriously. While there are *many* critiques that the heterodox tradition would level against this research agenda (see e.g., Marchionatti and Sella 2017; Lee and Keen 2004), MMT in particular alleges that failure to explicitly incorporate the state's currency monopoly is what makes it difficult for the mainstream paradigm to explain the source of the price level or the existence of unemployment, resorting at best to ad hoc additions to their models in order to generate these elements.

In this paper, I try to systematize MMT's claims by building a basic model that shows how "monopoly money" can naturally explain the source of the price level and the persistence of deficient effective demand. The argument will be split into two stages, first focusing on the price level before turning to effective demand. For each task I will begin by providing background on the heterodox theory, then build the models, and then provide further discussion.

Two brief warnings. First, the purpose of the models below are to show plausibility: they demonstrate that we *can* construct a mathematical system that operates according to the mechanisms described by MMT's monopoly money theory. No more than that is intended, although the fact that this can be done with relatively few assumptions is taken as evidence that this is a meaningful abstraction. Second, and more specifically, the model presents several elements reversed from how readers may be accustomed, in two respects: 1) most quantities are

nominal, and 2) all prices are "prices of money," i.e., what you have to give up to obtain one dollar.

A significant debt of gratitude should be acknowledged to Pavlina Tcherneva, whose earlier work on mathematizing monopoly money (Tcherneva 2002) inspired the present work. I do believe however that further insights can be derived by building a more complex set of models than she put forth.

2 THE PRICE LEVEL

2.1 The Theory

Mainstream macro has difficulty explaining the source of the price level. At heart, the GE paradigm is focused on relative prices, not absolute prices. The simplest models leave a free, exogenous parameter to account for the absolute price level. Even their proffered explanations tend not to actually explain the price level; for instance, the Phillips curve is a theory of *inflation* (i.e., changes in the price level) and not a theory of the price level itself. Within a Phillips curve world, the current absolute price level can only be rationalized as some sort of historical accident.

MMT by contrast has a straightforward theory of the price level: "[t]he price level is necessarily a function of prices paid by the government's agents when it spends, or collateral demanded when it lends" (Mosler 2020). The principle is simple: the state is the monopoly issuer of the currency, and monopolists set price. The price level is a function of what nongovernment agents have to do to get currency from the government, i.e., the government's collateral and procurement pricing policies (see Wray [1998a] for another statement of this principle). As a simple example, imagine the government is starting the monetary system from scratch and imposes a tax of $10 on you. Assuming the penalty for nonpayment is severe and you wish to avoid it, you then must supply to the government whatever they declare is sufficient to earn $10. If they offer to pay $10 per hour of labor, then one dollar is equal to six minutes of labor and you will work for (at least) one hour. Or, if they offer to pay $15 per hour, then one dollar is equal to four minutes of labor and you will work for (at least) 40 minutes.

3

Some commentary is in order. First, in the reverse of the Phillips curve model, this is a theory of the *price level* and not a theory of *inflation*. If it is true that the price level is simply determined exogenously by the government via the prices it decides to pay when it purchases goods, then inflation or deflation result when the government chooses to pay a different price for the same quantity of goods (or pay the same price for a different quantity of goods): "every time the government pays more for the same thing, it is redefining its currency downward" (Mosler 2011, 115). But, the question of "when and why do they do this" isn't immediately answered and we are in need of additional theory. MMT proponents do indeed work on more specific theories of inflation (see, for example, Fullwiler, Grey, and Tankus 2019 and Wray 2015: ch. 9), but this falls outside the scope of the present paper.

Second, the state's role as money monopolist is in fact questionable in two regards. First, the state is not the monopolist over all money, only of its own currency. Most of "the money supply" is issued by banks and other financial institutions.[1] And second, the state isn't even technically the monopolist over its own currency! The state is the monopoly *producer* of state money, but every purchase of goods or services with fiat money by anybody, by identity, constitutes a "sale" of the currency, hence in reality there are many sellers of state money. Does the state not "compete" with the rest of us somehow, reducing or eliminating any market power it might have?

In response to the first point, MMT highlights that while people can technically use whatever they want in their private exchanges, only state money can be used for final payment of taxes, fees, fines, and other duties to the federal government (Bell 2001). Since citizens owe these levies on an ongoing basis this implies that, other monies aside, there will be an ongoing demand for state money in an amount *at least* large enough to satisfy these involuntary

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[1] Although it is also possible to see these institutions ultimately as agents of the government; see Hockett and Omarova (2016)

obligations. In other words, state money, by design, has some degree of nonsubstitutability relative to other monies or financial instruments.[2]

The second point, regarding other sellers of state money, I believe to be a serious challenge to MMT, but I also propose a resolution. An analogy can be drawn to the study of "durapoly," a situation noted in mainstream antitrust and industrial organization literature in which there is a monopoly producer of a durable good and, once sold, this durable good can be "recycled" or resold by other suppliers back into the market (Orbach 2004). Of particular interest is the 1945 antitrust case of *United States vs. Alcoa*, concerning whether Alcoa, which controlled 90 percent of the production of new aluminum, in fact lacked monopoly power due to the existence of a competitive market in recycled aluminum.

There is significant mainstream literature on durable goods markets in general (Waldman 2003) and the Alcoa case in particular (Gaskins, Jr. 1974; Swan 1980; Suslow 1986). We need not delve deeply into the topic, but we can borrow a general result that a monopoly producer can retain pricing power over a durable good if there is some reason why outstanding units of the commodity become insufficient for meeting the community's demand. This can happen if units are lost or otherwise unavailable for recycling, or if demand is growing.[3] One or more of these conditions, if continued indefinitely, will eventually force buyers of the good back to the producer, granting the producer bargaining power. For our model this will be taxation: in the absence of government spending, taxation would eventually drain the supply of state money to zero, creating "shortages" in the "secondary market," forcing demanders of fiat money back to the government and thereby imparting it with pricing power.[4]

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[2] At least in aggregate. At the micro level, an acceptable substitute for state money can take the form of access to an intermediary who will transact in state money on your behalf. This is one way to understand bank deposits, whereby my bank can transact using state money (bank reserves) on my behalf.

[3] For instance, in his modeling of *Alcoa*, Gaskins notes "[w]ithout growth of demand, shrinkage, or depreciation, the long-run result is equivalent to a competitive market" (Gaskins, Jr. 1974, 262). "Shrinkage" refers to metal lost during the recycling process, while depreciation represents aluminum "irrevocably lost by physical deterioration or by destructive use" (Gaskins, Jr. 1974, 255). In other cases, in which these are nonzero, the long-run price need not equal the competitive price despite the existence of a competitive recycling market, implying market power.

[4] Another key difference relative to the models of *Alcoa* is that unlike aluminum, state money has no costs of production or recycling.

And finally, there's the question of realism. The monopoly money theory outlined here is a relatively high level of abstraction that ignores many real-world issues related to how business sets prices. By contrast, the Post-Keynesian tradition, particularly the price theory advocated by Fred Lee (1999), stresses the importance of realism and institutional detail as the basis for a theory of prices. Is there a conflict here?

I claim that in theory there is no conflict, but in the practice of policy there is. The mechanism we consider here by which the state can exert leverage over the price level ultimately must be some form of supply or demand pressure.[5] Consider interest rates: operationally, the state can set the overnight interest rate by offering to borrow or lend fiat money in unlimited quantities,[6] yielding an overwhelming force that can move the market price to the state's target even if market participants are feeling recalcitrant. While Post-Keynesian price theory does like to stress the extent to which businesses decouple prices from day-to-day supply and demand pressures, they would agree that imbalances beyond a certain magnitude can disrupt real-world market governance structures (Tankus and Herrine, forthcoming), and so are indeed likely to affect prices.[7]

Because taxes can only be paid using government liabilities, the private sector needs to obtain state money on an ongoing basis in order to avoid the penalties for tax evasion. This ensures that there is demand for government liabilities for *at least* whatever taxes are owed, meaning that in general (and pointedly, in the steady state in the model below) the state will normally be buying *something* offered for sale by the private sector in order to supply those funds. As long as prices display *some* sensitivity to supply and demand imbalances, even if only at the extremes, then through buying more or less (or zero) of a good, the state will be able to shift the price of at least one good toward its target. And this is true both in a Post-Keynesian world of administered prices that are only sensitive to supply and demand at the extremes, as well as an "efficient

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markets" world where prices move instantly to where supply and demand would eventually force them to anyway.

However, in a world where administered prices are ubiquitous, it is likely not good policy to use this fact as a tool to combat price level shifts. That is because to move prices, and especially to move them downward, can require an extremely large and disruptive pressure. For instance, imagine the state deciding to engineer a return to the price level of 50 years ago, announcing: "this year, we only will purchase goods at the prices that were charged five decades ago, and not a penny more." At these prices, presumably no supplier would be initially willing to sell anything, so government spending would drop promptly to zero. As taxes remain nonzero, private net financial wealth starts draining, setting up an enormous contractionary pressure that would create massive, Great Depression levels of unemployment and bankruptcies. This plunge in aggregate demand would savagely force prices downward, and this process would stop when prices approach the government's targets, as government spending becomes nonzero again and fills in the gap.

But who in their right mind would support this as an anti-inflationary policy? It would be disastrously destructive. Mosler acknowledges this, calling this sort of strategy "a completely impractical way" to fight inflation (Mosler 2011, 114). And so, although the high-level abstraction behind this theory of the price level is in principle perfectly compatible with the more grounded Post-Keynesian price theory, in practice, the realities of our administered price world make it highly problematic for the government to manage the price level through this particular channel. In practice, as has been explained elsewhere (e.g., Tcherneva 2020; Fullwiler 2005; Wray 1998b), a more practical approach might be to peg one particular price, such as the price of basic labor, and then allow market governance processes to generally determine relative values around this price. But the purpose here is not to offer a new policy tool; it is to explain the source of the price level.

With this background, I now lay out the core of the model.

2.2 The Model

This is a dynamic model, which can and does find itself out of equilibrium. Time is discrete and the economy is closed to foreign trade.[8] We model just one saleable good, the currency itself, as it exchanges for labor. There are two sectors setting prices, both the government and the nongovernment sector, so this is a "dual-price" model.

The government will purchase labor services by issuing liabilities. These liabilities are tax credits, as they are redeemed when they are accepted back by the state to settle tax obligations. I will refer to these tax credits using the terms "dollars," "credit balances," "fiat money," "money,"[9] and "net financial wealth" interchangeably. For simplicity we will only consider the government as issuing one kind of liability, although little should change if the government issues more than one type of liquid liability.[10] The quantity of government liabilities evolves as

$$V_t - V_{t-1} = G_t - T_t \hspace{3cm} [2.1]$$

where V is the stock of government liabilities, G is government spending, and T is tax revenue, all in nominal terms.

Once some private entity has obtained currency, they are able to resell the currency in the private market. The flow of credit balances intended for private resale (purchases of labor) is given by S_t. We would like resales to be zero if the money supply is zero, as no money is available to be recycled; we would also like resale activity generally to increase as net financial wealth increases, $\frac{dS}{dV} > 0$, modeling a wealth effect. While not the only possibility, a very simple way to satisfy these stipulations is:

$$S_t = kV_{t-1} \hspace{3cm} [2.2]$$

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[8] In other words, we only track stock variables for one resale sector—a sector that pays taxes and thus should be considered domestic only.

[9] There may be private monies, such as bank deposits, in the background, but I do not explicitly consider them.

[10] Though illiquid liabilities are a different story. See Levey (2019, 2020) for more discussion.

where k can be a constant or a function of price, and plays the role of a "recycling velocity of government liabilities." Because this is a flow quantity, k can be more than one, as the flow of transactions can be larger than the stock of money. This flow supply of money for resale is roughly analogous to private flow demand for goods and services, but it also includes intermediate transactions.

The private sector as a whole has some demand for flows of fiat money, D_t, for which it offers labor. This demand corresponds roughly to aggregate supply capacity, but again gross of intermediate transactions. As a basic model, I simply treat the demand for government liabilities as constant in real terms[11] given by

$$D_t = \frac{a}{p_t} \tag{2.3}$$

where p is the price of money in terms of goods[12] and a is a constant, indicating a nongrowing supply capacity.[13] D is therefore downward sloping in terms of the price of money.[14]

The demand for currency that actually gets filled by the government is labeled D^g, while the demand that actually ends up being filled by private resales is D^f. Determination of these

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[11] This is evocative of the standard backwards-L aggregate supply function in the "Keynesian" AS curve.

[12] There's some additional ambiguity because the model uses two prices of money, so in the simulations shown they are combined for determining demand by simply taking the mean value.

[13] These forms for the demand and supply functions imply that the private sector has a savings stock target. To show this, suppose that the desired saving for a period is modeled as proportional to the distance away from a target level: $\Delta V_d = k(\tilde{V} - V)$, but this change in the stock of debt is equal by identity to the government deficit, $G - T = k(\tilde{V} - V)$. When markets clear we have demand filled by either government or resellers, such that $D = G + S \Rightarrow G = D - S$ and therefore $D - S - T = k(\tilde{V} - V)$. Substituting the functional forms above for D, S gives $\frac{a}{p} - kV - T = k(\tilde{V} - V)$, implying a stock savings target of $\tilde{V} = \frac{\left(\frac{a}{p}\right) - T}{k}$, which is analogous to models with a savings target that is a certain multiple of disposable income (as in Godley and Lavoie 2006).

[14] Because fiat currency is needed to pay taxes, it would be wise to include terms in these functions that ensures that taxes can be paid. For demand that is $D_t = \max\left(\frac{a}{p_t}, T_t - V_{t-1}\right)$, which ensures that there's always enough labor on offer so as to at least obtain enough money to satisfy the tax obligation if savings are insufficient. For supply this could be $S_t = \min(kV_{t-1}, V_{t-1} + D_t - T_t)$, which ensures that when savings plus current income are insufficient then spending is diverted to tax payments instead. Together these prevent the stock of government liabilities from going negative, modeling the idea that the private sector will supply at least enough labor to the government to ensure that taxes can be paid. However, as a practical matter, in simulations throughout this paper I instead simply choose parameter values such that this is never a concern anyway.

9

variables is summarized in table 1. Buyers of fiat money can "purchase" it from the government or the resale markets, and select according to which offers a better price, where p^g is the exogenously determined price of money in government transactions, while p^f is the price of money prevailing in private markets. Buyers of money only turn to the other market if they still have residual unfilled demand after the first source is exhausted.

Table 1: Determination of Transaction Values in Each Market

	$p^f > p^g$	$p^f \leq p^g$	
		$D \leq S$	$D > S$
D^f	0	D	S
D^g	D	0	$D - S$

Note: Buyers of money go first to wherever the price of money is lowest, then move to the alternative supplier if they still have residual orders.

Table 1 can be translated into equations. D^f is given as

$$D_t^f = H\left(p_t^g - p_t^f\right) \cdot \min(D_t, S_t) \qquad [2.4]$$

where H is the *Heaviside step function*, which takes on the value of one if its argument is greater than or equal to zero, otherwise it takes the value zero. The latter corresponds to the situation when citizens find it's cheaper to obtain money from government transactions than from private ones, and so they have no need to go to the resale market, which then sees zero transactions. When the private sector is offering an equal or better price, then transactions happen according to a "short-side rules" constraint of $min(D, S)$.

This also tells us about our fiscal policy: government spending takes the form of a buffer stock of employment, sometimes called a job guarantee (JG), whereby the government announces a fixed price and then sells money to anybody who wants to buy it at that price, in unlimited quantities. This gives

$$G_t = D_t^g = D_t - D_t^f \qquad [2.5]$$

10

indicating that any flow demand for currency not being met in the private markets will be residually filled by the government, acting as money seller of last resort.

The final major equation governs price adjustment in the private sector. There is one factor—unplaced private supply, S^u—that can lead to a fall in price. There are two factors that can lead to an increase in the private price of money: unfilled demand, D^u, as well as demand that is filled by the government at a higher price than private transactions, $D^{\overline{u}}$, which enables private sellers to exploit this differential to edge their prices up. The price adjustment equation then is[15]:

$$\hat{p}_t^f = \phi\left[D_{t-1}^u + D_{t-1}^{\overline{u}} - S_{t-1}^u\right] \tag{2.6}$$

where $\hat{p}$ indicates the growth rate of p[16] and ϕ is a constant that sets how reactive markets are to imbalances, while the quantity in square brackets measures total the market imbalance. These imbalance terms are defined as:

$$S_t^u = S_t - D_t^f \tag{2.7}$$

$$D_t^u = D_t - \left(D_t^f + D_t^g\right) \tag{2.8}$$

$$D_t^{\overline{u}} = D_t^g \cdot \max\left(\frac{p_t^g - p_t^f}{p^f}_t, 0\right) \tag{2.9}$$

$D_t^{\overline{u}}$ is defined such that either more transactions or a larger price discrepancy provides greater impetus for private price increases.[17]

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[15] Why is this equation asymmetrical? Why is there a $D^{\overline{u}}$ but no $S^{\underline{u}}$? While D^u and S^u refer to market imbalances, $D^{\overline{u}}$ actually refers to a situation where there is no visible market imbalance and yet the existence of transactions happening elsewhere at a higher price affords market power to private sellers of money: the government is seen here as residual seller of money, filling leftover demand after private supply has been exhausted. The reverse case would correspond to a situation in which private demand had been exhausted and yet there was still private supply, which the government then purchased back residually at a lower price. But because the government in the model does not sell any goods, these transactions don't occur.

[16] $\log p_t - \log p_{t-1}$

[17] A proportionality constant could be added here, but it will not affect the final result. For simplicity, I set it to one.

Note that in this model, because we have a JG filling in residual (flow) demand for currency, D^u is always zero: if there is more demand than supply in the private markets, the JG fills it (though these transactions may fall into the $D^{\overline{u}}$ variable). But we will need D^u later, so I introduce it here. Note also that nothing in the model prevents entities from meeting to trade, and so while any of $D^u, D^{\overline{u}}$, or S^u could be nonzero, the D terms and the S term cannot all be nonzero at the same time.

2.2.1 The Steady State

The key question is: Can there be an equilibrium in which the private market price of money differs from the price of money exogenously determined by government through its procurement pricing policy? If not, then we conclude that the government has market power. To answer this question, we must find the steady states of the model.

First, in the steady state the money supply will be fixed, meaning the government's budget will be balanced:

$$\Delta V = G - T = 0 \Rightarrow G = T$$

Additionally, prices should be unchanging in the steady state, giving:

$$\hat{p}^f = \phi\left[D^u + D^{\overline{u}} - S^u\right] = 0$$

$$D^u + D^{\overline{u}} - S^u = 0$$

As mentioned above, D^u is always zero because of the JG, and $D^{\overline{u}}$ and S^u cannot both be nonzero at the same time, and so we have $D^u = D^{\overline{u}} = S^u = 0$. There are three possible cases that will affect the way these quantities go to zero: $p^f > p^g$, $p^f < p^g$, or $p^f = p^g$. Our observation will be that the first two possibilities are quite troublesome, while the third is not.

If $p^f > p^g$, then because consumers opt to obtain fiat money from the government at the lower price, we have $D^f = 0$ and $G = D$. Since $S^u = S - D^f = 0$, this gives $S = 0$. This corresponds

to a situation where the entire economy is on the government's budget, because it is supplying fiat money at a better price than the private sector. $S = kV = 0$ would suggest that $V = 0$. All in all, this is not a very interesting economy, as there is no private activity and no long-term base money supply.

In the case where $p^f < p^g$, since $D^{\overline{u}}$ must be zero, we must have that $D^g = G = 0$, i.e., nobody is working in the JG and government spending is zero. But because the budget must be balanced in the steady state, this scenario is only possible if tax revenue equals zero as well, which is a highly unrealistic case.

These two steady states are clearly troublesome and inapplicable to any real-world economy. The third case, where $p^f = p^g$, is well-behaved, with $D^f = S$ and $0 \leq G = D^g = D - S \leq D$, and private demand for fiat money is filled first by the resellers and then residually by government spending.

What we have just done is ruled out equilibrium cases in which the private price of money does not come to equal the exogenously determined price that government pays when it spends. In other words, even though the government is not the sole seller, its status as monopoly producer of its own currency can afford it pricing power, so long as taxes are greater than zero.

2.2.2 Simulation Results

Figure 1: Simulation of the Dual-Price Model with a Buffer Stock
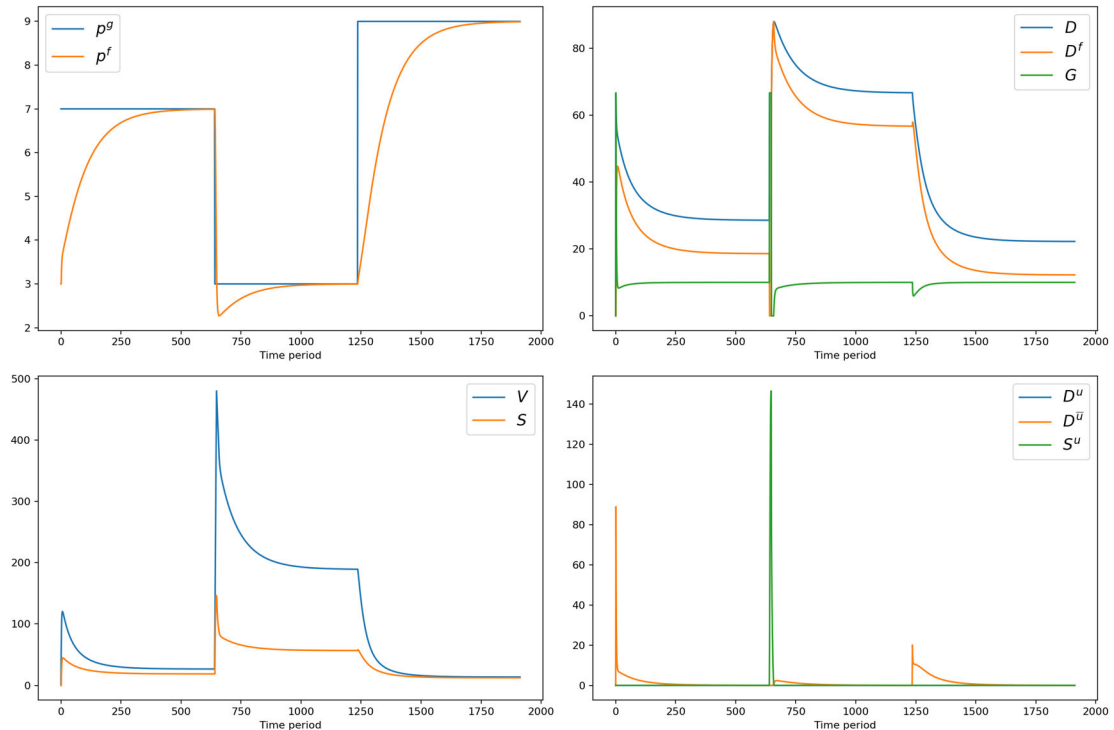
Note: The model runs until the steady state is reached, then the p^g is shocked and the model runs to a new steady state twice.

The results of a simulation run of the model are shown in figure 1. The recycling function was coded as a simple increasing linear function of the price of money.[18] After initialization, the model runs to a steady state in which the private price comes to equal the government price of money. Once this steady state is reached, I shock the model by reducing the government price of money. We can see that the private price first overshoots it but then again is attracted to the government-announced price. After that new steady state is reached, I shock the model again by raising the government money price, and the private price follows promptly.

One notable feature is that when the government price drops, the private price overshoots to the downside before rising back up to meet it. This is because at the moment the price falls, all activity in the private sector ceases as the entire economy flocks to the government's budget.

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[18] One complication is that buyers of money purchase it at two prices, so the demand curve needs to be a function of both. However so long as the functional form is reasonable this has minimal impact on the results; in the simulation below I use the mean of the two prices.

This massive imbalance pushes down severely on the private price, at the same time that the increase in government spending increases the supply of money to be recycled.

2.3 Further Discussion

We considered the deflationary case earlier so now we consider the inflationary case. If the government decreases the price of money (increases the prices it pays for goods), then private buyers of money (sellers of goods) flock to buy from (sell to) the government. More concretely, imagine that the government's purchasing policy this year would be to take all the prices it paid last year and multiply them by 100. Besides expenditure multiplying by roughly 100, we'd also expect that no supplier would stay in the private markets if they could get a significantly better price from the government. The result is that: a) private buyers of goods would have to bid up their price roughly to match if they hoped to end up with any goods, and b) the enormous increase in spending would lead to increases in private income and wealth, and therefore aggregate demand. Unsurprisingly, offering to pay 100-times more for something is highly inflationary.

A skeptic might ask why the government is special here: surely any large entity could do the same thing. What if Amazon offered to pay 100-times more as well, would that not have the same inflationary effect?[19] The answer is they could try and it might; however, as Amazon is not the currency issuer, they will only be able to push such a move so far. Immediately they will start taking large losses, quickly running down their assets and forcing them to borrow money. When their credit limits are reached, they will be forced to blink and call off the ploy. But the currency issuer need not blink. Of course, there's clearly no incentive for a firm to try this anyway. And after the move fails, if the government held fast to its previous prices, then that would set in motion the deflationary forces discussed earlier to undo the changes.

Finally, one might question the use of a JG—a policy specifically promoted as a price anchor (e.g., Tcherneva 2020; Fullwiler 2005; Wray 1998b)—as our only fiscal policy. Is this not tipping the scales toward a preferred result? While it's true the JG performs this task well, the same result in which private prices converge toward the government's price can be seen without

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[19] Thanks to David Andolfatto who posed this question.

a JG. In section sec. 3.2.1, I introduce a mechanism that allows the government to limit how much it spends, so that it spends less than the total demand. If one runs the same experiments as above but with this additional mechanism, the path may be different but the steady states are the same.[20]

Our conclusion is that the government, as the monopoly issuer of its own currency, could, if it so desired, hold fast to a particular price level, justifying the assertion that the price level is a function of prices paid by the government when it spends or lends. I now turn to the question of what happens if the monopolist refuses to supply enough of its liabilities to meet the demand.

3   DEFICIENT EFFECTIVE DEMAND

3.1   The Theory

The current dominant paradigm in mainstream macro modeling is to model the trend growth of output as a function of supply-side factors, while fluctuations around this trend may be influenced by demand. This is justified by a belief that price adjustments (especially wage and interest rate adjustments) can and will move the system toward full employment in the long run, or at least to some "natural" rate of unemployment with no Keynesian underutilization. The existence of Keynesian underutilization in the short run is justified by an appeal to sticky prices of some sort that hinder this process.

Quite often this analysis is actually attributed to Keynes, but one is hard-pressed to find anything resembling it while reading *The General Theory*. In fact, Keynes (1936, 232, emphasis added) seems to say the opposite: "The fact that wages tend to be sticky in terms of money, the money-wage being more stable than the real wage, tends to limit the readiness of the wage-unit to fall in terms of money. Moreover, if this were not so, *the position might be worse rather than*

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[20] In fact, this mechanism actually reaches equilibrium *more* smoothly. With the JG, if the price of money is lowered (the wage is raised), the entire economy packs onto the government budget. By analogy, if the government today instituted a JG with a wage of $10,000 per hour, nearly every private worker would quit their job and join the JG. But if there is an upper limit to government spending, then this highly disruptive shift is dampened during the transition to a new steady state price level.

better." He also states, "there is, therefore, no ground for the belief that a flexible wage policy is capable of maintaining a state of continuous full employment (Keynes 1936, 267)."

Keynes attributes the unemployment problem to deficient effective demand, and in chapter 17 of the *General Theory* he argues that the origin of this is the monetary system. This is owed to several special characteristics of money, particularly: 1) that its elasticity of substitution is zero, meaning that no change in the price of money is sufficient to choke off the demand for it, and 2) its elasticity of production is zero, simply meaning that it cannot be produced by labor in the private sector. These two properties combined mean that if the supply of money is short of the demand, then no amount of price adjustment will be able to obviate the shortage[21]: "Unemployment develops, that is to say, because people want the moon;—men cannot be employed when the object of desire (i.e. money) is something which cannot be produced and the demand for which cannot be readily choked off" (Keynes 1936, 235).

This argument is well trodden, and I find it basically convincing. But I believe that reconsidering these ideas in light of the monopoly money view leads to several further insights. First, in our context, we should interpret "money" to refer to all liquid government liabilities (and instruments pegged to those liabilities such as bank deposits). This keeps us in the simplified world of the money recycling model above, in which we can ignore the composition of government liabilities and consider the net financial assets of the nongovernment sector overall.

Second, analogous to above when we noted that the state is not the monopoly *seller* of its liabilities, only the monopoly *producer*, by private demand for money Keynes must be referring to *net* demand, i.e., private demand for money minus private supply of money to resell. The reason this is significant is because there are two ways it can be decreased: either decrease the

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[21] Although general equilibrium models pride themselves on being able to generate a price vector that clears all markets, as Paul Davidson has been reminding us all for years, this is only possible due to additional assumptions of these models, and in particular the adoption of the "axiom of gross substitutability," which is simply an assertion that every commodity has some degree of substitutability with every other commodity (Davidson 1978, 1984, 1990a, 1990b, 1992a, 1992b, 1993a, 1993b, 1996a, 1996b, 1996c,1998, 1999a, 1999b, 1999c, 1999d, 2000, 2001a, 2001b, 2004, 2007, 2011, 2012, 2013, 2017).

gross quantity of money demanded (all transactions where goods or labor are offered for financial assets) or increase the quantity intended for resale.

Third, the reasons typically given for the "zero elasticity of substitution" property stress the need for liquid assets to deal with uncertainty, and this is fine as far as it goes. But MMT's "tax-driven money" story (Tcherneva 2006) invites us to add two more reasons to the list why money should face a demand that is not liable to be choked off by price changes. First, there will be a highly inelastic demand for the dollars that are needed to pay taxes in order to avoid the (presumed harsh) penalty for tax evasion. This can be seen vividly in cases where taxes have been directly used to monetize an economy (Forstater 2006). And second, in an uncertain world, there will be an inelastic demand to hold a precautionary buffer of dollars to meet these tax obligations specifically. If the penalty for failure to pay is high, then it's wise to hold some precautionary liquid assets to insure against this happening. Some factors likely to influence this might be the method of tax payments, the probability of being unable to pay due to illiquidity or lack of savings, and the size of the expected penalty for nonpayment.

Fourth, returning to the "zero elasticity of production" property: In the context of monopoly money, what is this if not merely a statement that the currency issuer is refusing to provide enough of its liabilities to meet the demand and "clear the market"? Note for instance that a JG, in which the government employed anybody who wanted to work at a fixed wage, would end the unemployment problem exactly by altering this property, so that labor would always be able to "create" money on demand. The mainstream belief that price adjustments will eliminate unemployment ultimately amounts a hope that somehow the market can absolve the state of its bad behavior vis-à-vis its own currency. But recognizing the currency as a monopoly gives reason to question this: if the monopolist, i.e., the state, refuses to meet the net demand then it will simply be unmet. As for price, we saw before that the monopolist sets the price and if the monopolist is keen to hold that price then the market must follow.

But even if a fall in the price level *could* choke off the demand for government liabilities, and the government accommodated the fall through its procurement policies, there is an additional dynamic consideration, which leads to the fifth and final point. This is a point generally ignored by the static framing given by Keynes above. It is: What is the *ongoing* impact of contractionary

fiscal policy on private demand, and what are the impacts of price changes on this fiscal stance? This is a good moment to segue into the model.

3.2 The Model

In order to demonstrate the operative principles using the dual-price modeling scheme from section 2.2, first we'll need to add two pieces of machinery to allow the government to run fiscal policy that isn't a JG. Instead, it will try to purchase a particular quantity of goods and this will happen without a guaranteed market-clearing mechanism.

3.2.1 Spending Limits

Consider the purchasing rule that simply attempts to spend a fixed amount of money, G^l, again at the government's exogenously determined price. If the government's price of money is better than the resale market price then, as before, all demand will be *initially* shunted to the government. If the limit G^l is less than the total demand for money flows, then the government's aim will be achived, and meanwhile private purchasers of money will be forced to the resale markets to fill their remaining demand at a higher price. However, if G^l is *greater* than the demand, then the short side rules and government will simply be unable to spend all the money it desires; additionally, since all demand is being fulfilled by the government already, resale market activity will be zero.

Conversely, if the price of money in the private market is better than the government's price, then demanders of money will buy in the private sector first, only turning to government when private supply is exhausted. If this remaining demand exceeds the government's limit, then the government will be able to hit its goal and any last remaining demand will go unfilled; while if this demand falls short, then government will spend less than the desired amount.

The cases so far may be summarized in table 2, which translates into these two market mechanism equations[22]:

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[22] Although it's straightforward reasoning on its own, the results of table 2 can be derived from an optimization problem. The goal of buyers of money is to minimize how much labor they expend to purchase the desired quantity of money, subject to the constraints imposed by limited supply in each market. That is, choose D^f and D^g so as to minimize $D^f p^f + D^g p^g$ subject to $0 \leq D^f \leq S$, $0 \leq D^g \leq G^l$, and $D^f + D^g = min(D, S + G^l)$.

$$D_t^f = H(p_t^g - p_t^f) \cdot \min(D_t, S_t) + \left(1 - H(p_t^g - p_t^f)\right) \cdot \max(\min(S_t, D_t - G^l), 0) \qquad [3.1]$$

$$D_t^g = H(p_t^g - p_t^f) \cdot \max(\min(D_t - S_t, G^l), 0) + \left(1 - H(p_t^g - p_t^f)\right) \cdot \min(D_t, G^l) \qquad [3.2]$$

where H again is the Heaviside step function. In each equation, if $p^g \geq p^f$ then the H term takes over while the $1 - H$ term is zero, and vice versa if $p^g < p^f$.

Table 2: Determination of Transaction Values in Each Market in the Model with Government Spending Limit

	$p^f > p^g$			$p^f \leq p^g$		
	$G^l < D$		$G^l \geq D$	$D \leq S$	$D > S$	
	$S \leq D - G^l$	$S > D - G^l$			$G^l \leq D - S$	$G^l > D - S$
D^f	S	$D - G^l$	0	D	S	S
D^g	G^l	G^l	D	0	G^l	$D - S$

Note: Buyers of money go first to wherever the price of money is lowest, then move to the alternative supplier if they still have residual orders.

3.2.2 Spending Targets

Now we have the government able to spend less than the demand for money at its fixed price. We're also going to let government choose this nominal spending limit based on prices, so that it ends up buying a particular target quantity of goods g^T:

$$G_t^l = \frac{g^T}{p_t^g} \qquad [3.3]$$

And if that target goes unmet then government will respond by reducing its offer price of money (increase its bid price for labor) in subsequent periods until it hits the target. The discrepancy that determines whether it has hit its target is

$$G_t^u = G_t^l - D_t^g \qquad [3.4]$$

The government also prefers to economize rather than severely underprice the money (overpay for goods), so it also watches the private market for higher money prices (lower goods prices)

and takes this as its cue to adjust its own price to accordingly. Similar to $D^{\overline{u}}$ this discrepancy is given as

$$G_t^{\overline{u}} = D_t^f \cdot \max\left(\frac{p_t^f - p_t^g}{p_t^g}, 0\right) \tag{3.5}$$

The overall price adjustment equation is therefore

$$\hat{p}_t^g = \phi\left[G_{t-1}^{\overline{u}} - G_{t-1}^u\right] \tag{3.6}$$

where $\hat{p}$ again indicates the growth rate of p. If the government does not sell as much money as it is targeting, then it will reduce the price (although this will change the target), whereas if private transactions are happening at a better price, it will raise its price to come into line.

Finally, for good measure, since government spending is now less flexible, I allow for some additional flexibility on the tax side, by imposing taxes proportional to total transactions, with tax rate θ:

$$T_t = \theta\left(D_t^f + D_t^g\right) \tag{3.7}$$

3.3   Model Results

Combining the equations above, the full model is now:

$$V_t - V_{t-1} = G_t - T_t \tag{3.8}$$

$$S_t = kV_{t-1} \tag{3.9}$$

$$k = k(p_t) \tag{3.10}$$

$$D_t = \frac{a}{p_t} \tag{3.11}$$

21

$$G_t^l = \frac{g^T}{p_t^g} \tag{[3.3]}$$

$$T_t = \theta\left(D_t^f + D_t^g\right) \tag{[3.6]}$$

$$D_t^f = H\left(p_t^g - p_t^f\right) \cdot \min(D_t, S_t) + \left(1 - H\left(p_t^g - p_t^f\right)\right) \cdot \max\left(\min\left(S_t, D_t - G_t^l\right), 0\right) \tag{[3.1]}$$

$$D_t^g = G_t = H\left(p_t^g - p_t^f\right) \cdot \max\left(\min\left(D_t - S_t, G_t^l\right), 0\right) + \left(1 - H\left(p_t^g - p_t^f\right)\right) \cdot \min\left(D_t, G_t^l\right) \tag{[3.2]}$$

$$S_t^u = S_t - D_t^f \tag{[3.12]}$$

$$D_t^u = D_t - \left(D_t^f + D_t^g\right) \tag{[3.13]}$$

$$D_t^{\overline{u}} = D_t^g \cdot \max\left(\frac{p_t^g - p_t^f}{p_t^f}, 0\right) \tag{[3.14]}$$

$$\hat{p}_t^f = \phi\left[D_{t-1}^u + D_{t-1}^{\overline{u}} - S_{t-1}^u\right] \tag{[3.15]}$$

$$G_t^u = G_t^l - D_t^g \tag{[3.4]}$$

$$G_t^{\overline{u}} = D_t^f \cdot \max\left(\frac{p_t^f - p_t^g}{p_t^g}, 0\right) \tag{[3.5]}$$

$$\hat{p}_t^g = \phi\left[G_{t-1}^{\overline{u}} - G_{t-1}^u\right] \tag{[3.6]}$$

These mechanisms allow for a government that targets a certain quantity of goods and pays market prices for them, but as can be seen in the figures this leads to severe problems. If g^T is too large, as shown in figure 2, then we observe hyperinflation (a crashing price of money) as the net financial wealth of the economy grows without limit. This takes the form of a

22

"conflicting claims" inflation, as the government tries to undercut private sales of money (bid up the price of goods) in order to sell money (buy goods) to the limited demand (supply), shown more clearly in figure 3 Conversely, if g^T is too small, shown in figure 4, then the result is a "hyperdeflation" in which the government's relentless raising of its money-selling price (reducing its goods-buying price) to match the private sector's leads to a continuous drop in private financial wealth, and therefore in private money recycling, leading to further deflation, and so on.

Figure 2: Simulation of the Monopoly Money Model with Fixed Government Purchase Targets and Proportional Taxes: Inflationary Case
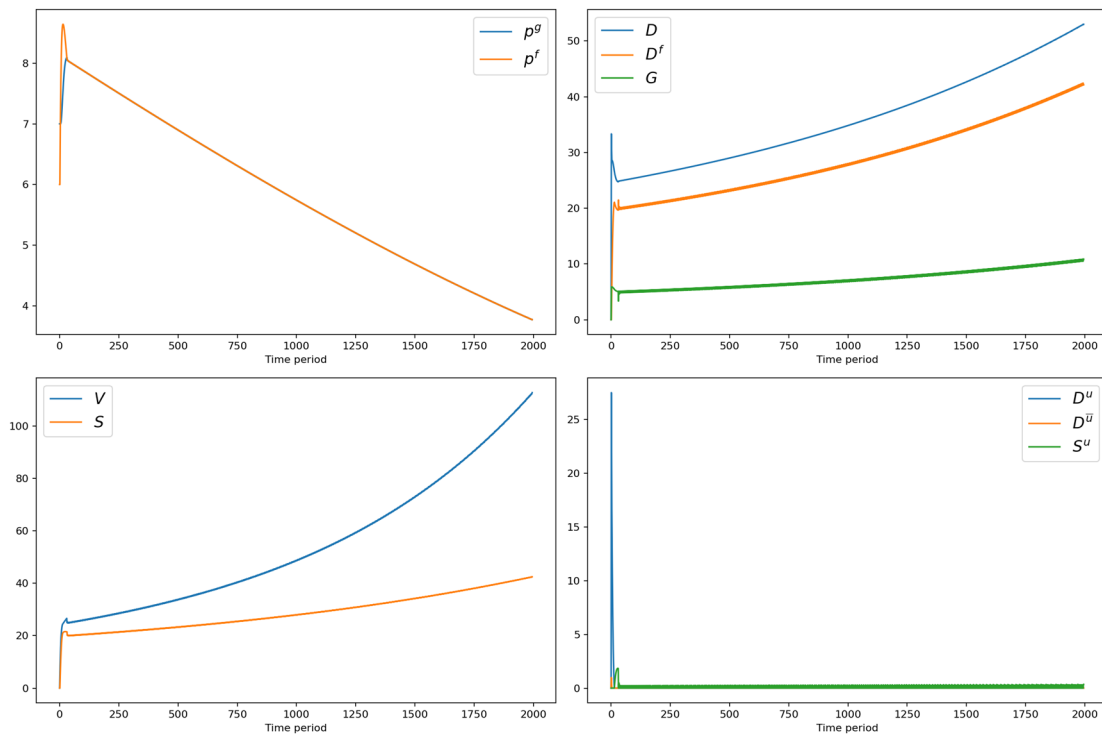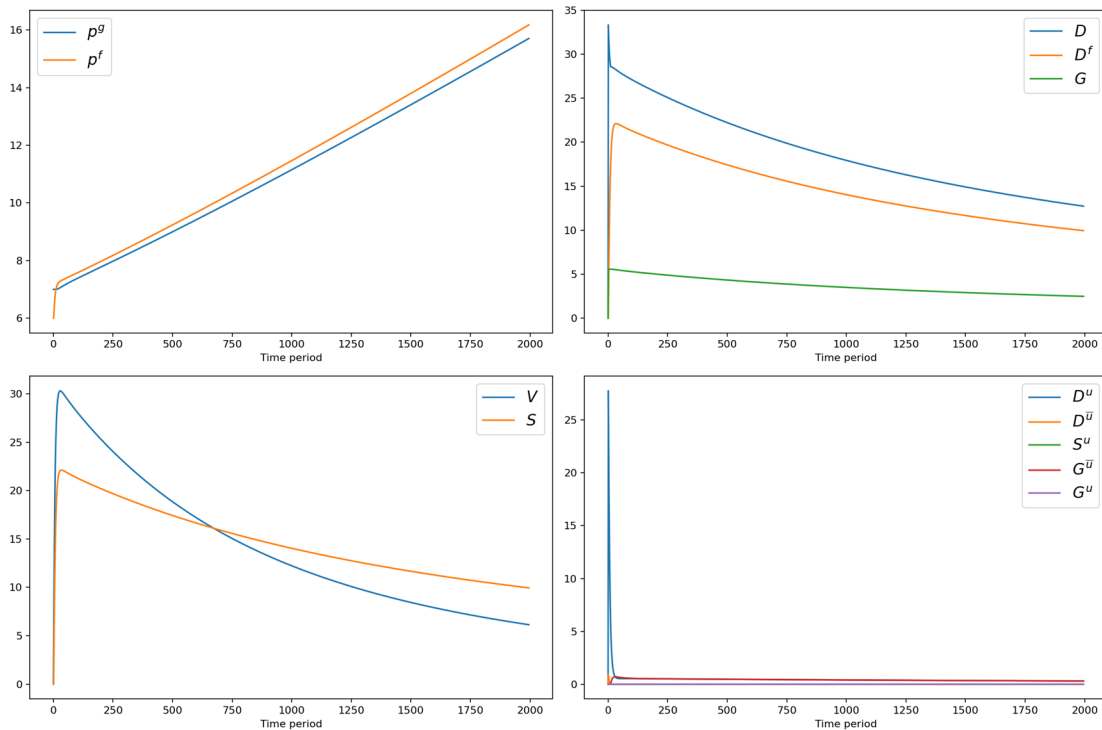

Note: The result is knife-edge instability, with hyperinflation shown in this case, as perpetual government deficits in a nongrowing economy continually add net financial wealth to the nongovernment sector.

Figure 3: Short Subset of the Timeline from Figure 2
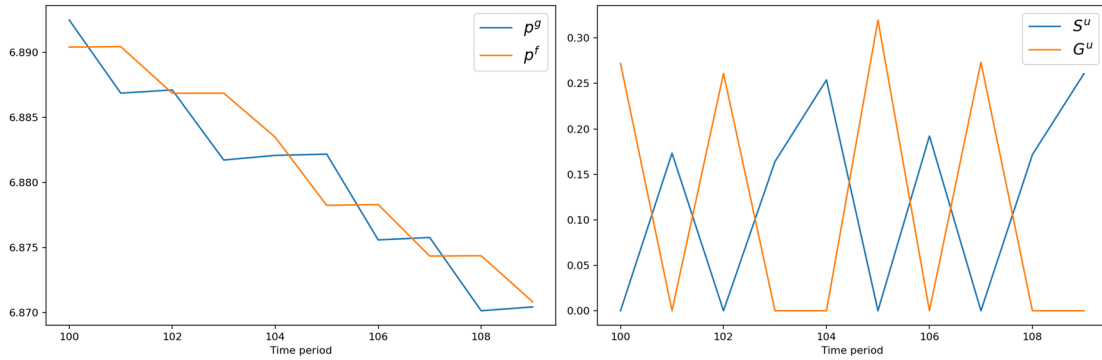
Note: Each sector is increasing its bid price for goods (reducing its offer price for money) in response to the other doing the same in order to attain its desired share of real resources.

Figure 4: Simulation of the Monopoly Money Model with Fixed Government Purchase Targets and Proportional Taxes: Deflationary Case


Note: The result is knife-edge instability, with hyperdeflation shown in this case, as government surpluses continually drain net financial wealth from the nongovernment sector.

Because markets are not required to clear in this model, the deflationary collapse can come with unemployment as well, depending on the parameter values and functional forms. While suitable choices (breaking with Keynes's "nonsubstitutability" property of money) could eliminate unemployment within a period, they would also tend to speed up the deflationary collapse. We can arrest the collapse by halting private price adjustment. This could be done either by creating

24

a buffer so that private prices don't adjust until the market imbalance becomes particularly severe (as in the "horse-shaped" Post-Keynesian Phillips curve, which is flat in the normal region but sloped out at the extremes; see Kriesler and Lavoie [2007]). Alternatively, for the sake of demonstration, we can simply freeze private price adjustment altogether by setting $\hat{p}_f = 0$, which is what's shown in figure 5. Obviously in either case the model becomes highly path dependent. And, in the case of deficient effective demand, while we have alleviated the problem of collapse, we have set in stone the problem of unemployment, shown as a positive steady state value for D^u. Pick your poison.

**Figure 5: Simulation with Deficient Demand and Frozen Private Prices**
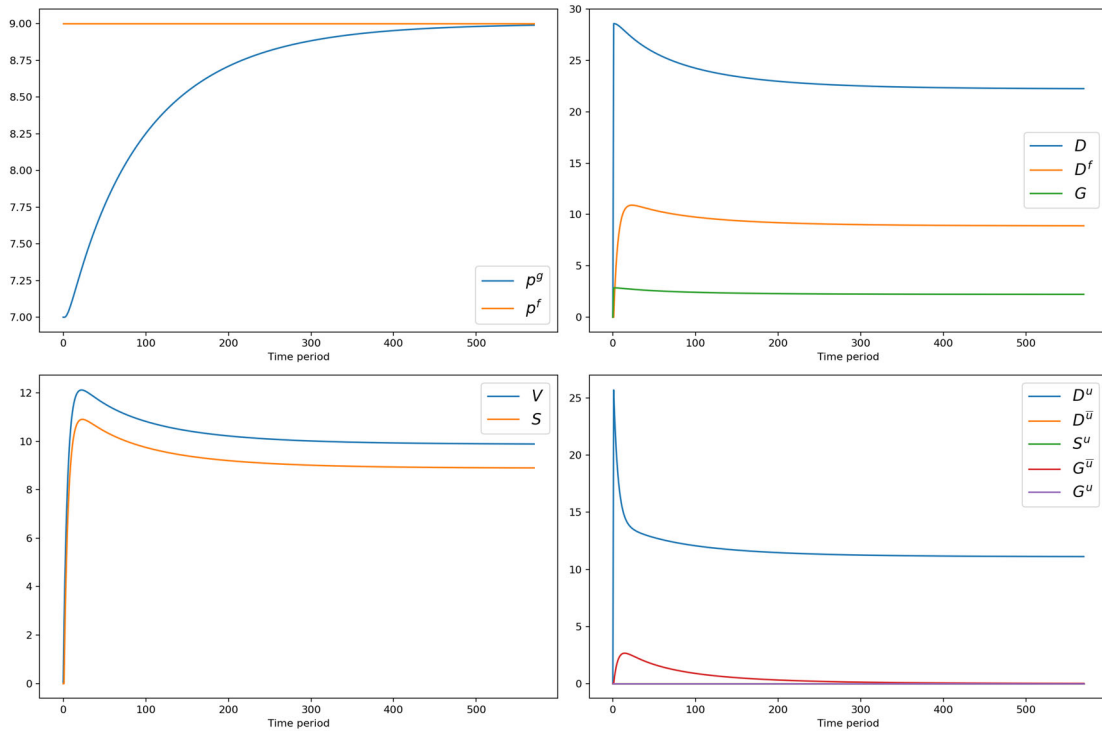
Note: The steady state positive value for D^u indicates persistent unemployment, however the model has otherwise come to rest.

3.4 Further Discussion

I believe we should permit Keynes's zero elasticity of substitution property for liquid financial assets. But even if we didn't, the models above give us two additional reasons to doubt that price adjustments will be stabilizing in the face of unemployment if fiscal policy isn't specifically geared toward stabilization.

The first problem is that if government procurement policy is to pay market prices for a fixed quantity of goods, then the government is supplying its liabilities according to the equation $G = \frac{g^T}{p}$, which is a *downward-sloped supply curve*. With a downward-sloped supply curve we are not guaranteed "orderly" market behavior. The demand curve may be below the supply curve at all prices, indicating spiraling inflation. Or the curves may intersect at unstable equilibria, such that a small perturbation from equilibrium sends the model shooting off to deflation (as in figure 6).

Figure 6: Downward-sloping Supply Curve of the Form g^T/p along with a Downward-sloping Demand Curve
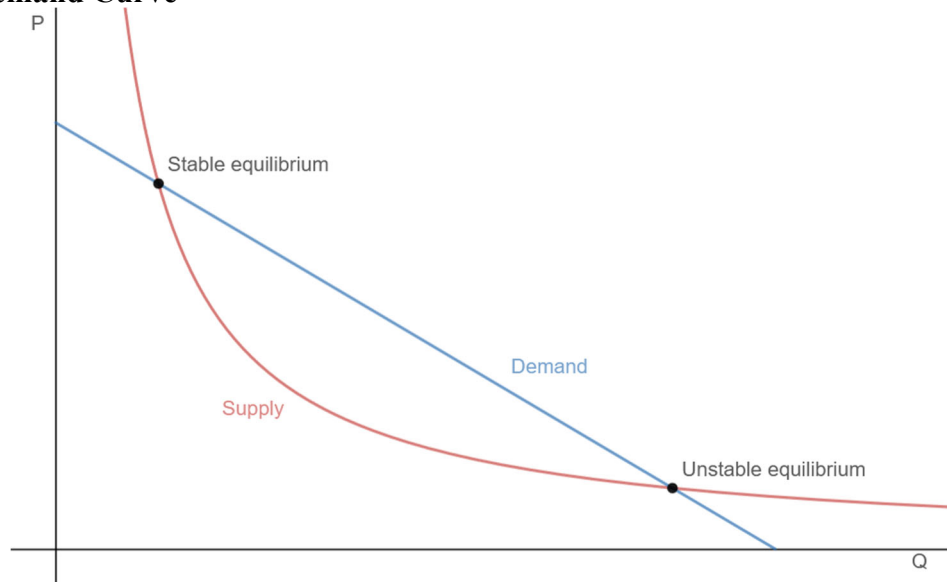
Note: There could be no solutions, one solution, or, as in the figure, two equilibria, only one of which is stable.

However, a stable equilibrium is still possible with a downward-sloped supply curve. Furthermore, when we add in private recycling supply that could be a standard upward-sloping curve, the government's perverse supply should get diluted until the curve begins to look orderly again. And so to locate the deeper source of the system's bad behavior we must consider a more sophisticated heuristic, which takes into account the accumulating effect of government liabilities on private spending.

3.4.1 Instability in Miniature

Let me present the smallest model I can think of that illustrates the operative principle, consisting of the following five equations:

$$S_t = kV_{t-1} \qquad\qquad [3.16]$$

$$D_t = \frac{a}{p_t} \qquad\qquad [3.17]$$

$$V_t - V_{t-1} = G_t - T_t \qquad\qquad [3.18]$$

$$G_t = \frac{g^T}{p_t} \qquad\qquad [3.19]$$

$$T_t = \theta(G_t + S_t) \qquad\qquad [3.20]$$

plus a market-clearing condition

$$D_t = G_t + S_t \qquad\qquad [3.21]$$

As before, the major variables are all nominal, with S as private resales of government liabilities (henceforth "dollars"), D as the demand for dollars, and G and T in dollar terms. p is again a price of money. k is the recycling velocity, now actually a constant, and a is a constant indicating the demand for money. Our government has a simple fiscal policy of a proportional tax, with θ as the tax rate, and a fixed demand for goods, g^T, for which the government is willing to pay market prices to obtain.

We can solve the model with just a little algebra.

$$D_t = G_t + S_t \Rightarrow \frac{a}{p_t} = \frac{g^T}{p_t} + kV_{t-1} \Rightarrow p_t = \frac{a - g^T}{kV_{t-1}}$$

$$V_t = V_{t-1} + G_t - T_t = V_{t-1} + \frac{g^T}{p_t} - \theta D_t$$

$$V_t = V_{t-1} + \frac{g^T k V_{t-1}}{a - g^T} - \theta a \frac{k V_{t-1}}{a - g^T}$$

$$V_t = V_{t-1} \left(1 + \frac{k}{a-g^T} [g^T - \theta a] \right) \qquad \text{[3.22]}$$

This is an unstable difference equation and its trajectory depends on the quantity in square brackets, $[g^T - \theta a]$. If this quantity is positive then the supply of government liabilities will accelerate toward infinity, resulting in hyperinflation; if it is negative, the supply of government liabilities will asymptotically approach zero while their value skyrockets, a "hyperdeflation."

This is a market-clearing model. If the initial price level is such that there is unmet demand for money, then the currency will deflate sufficiently so as to choke off the demand. And yet if government purchases, g^T, are below the threshold, the model still exhibits a deflationary collapse. How does this happen?

The operative mechanism is the fiscal balance. Consider the case of a nongrowing economy with a permanent government surplus: this implies that the private sector is running down its financial wealth and eventually will be in ever-increasing debt to the government. We'd expect this falling net financial wealth to correlate with falling private spending. In the reverse case, a nongrowing economy with a permanent government deficit implies an ever-increasing stock of financial wealth in the private sector, which we'd expect to result in ever-increasing private spending. In the real world this link may not be immediate or one-for-one, but the point still stands even with a lagged or nonlinear relationship, so long as $\frac{dS}{dV} > 0$ in whatever sense is appropriate.

The source of the problem then is that, with proportional taxes and government purchasing a fixed quantity of goods, adjustments in the price level cannot close the fiscal position, i.e., convert a surplus into a deficit or vice versa or balance the budget. That is, there is no value of p that can cause $\Delta V = G - T = \frac{g^T}{p} - \frac{\theta a}{p}$ to equal zero if g^T isn't equal to θa. In fact, the inflation-adjusted budget balance is always fixed, as

$$\frac{d}{dp}p\Delta V = \frac{d}{dp}p\left(\frac{g^T}{p} - \frac{\theta a}{p}\right) = \frac{d}{dp}(g^T - \theta a) = 0$$

This means that price adjustments cannot stabilize the stock of private net financial wealth in this fiscal regime: it either rises without limit or falls without limit, depending on fiscal parameters, dragging nominal aggregate demand and the price level with it. And so a falling price level in response to unemployment is a temporary fix at best, that portends a continuing nominal collapse.

If private prices were frozen then the collapse would halt, but sticky prices would of course manifest as persistent underutilization (in the downward case) or shortages (in the upward case). This sort of reasoning bolsters Keynesian claims that more flexible prices would make the problem worse—in the model above, if prices are perfectly flexible and $g^T < \theta a$, then the dollar economy will quickly collapse to zero. Zooming out, a high-level intuition for what's going on is that if the dollar monopolist refuses to specify the terms on which it will hand out dollars, then it is leaving the currency unpegged and instability is the unsurprising result of the positive feedback loop formed between market prices and nominal fiscal policy.

An intuitive way to understand this graphically is on an aggregate-demand/aggregate-supply (AD/AS) plot; while there are many well-known issues with the AD/AS framework, I invoke it here only for heuristic purposes, not to serve as a full-fledged model. Keynes's argument about the special characteristics of money that prevent price adjustments from being able to choke off demand can be interpreted as saying that the AD and AS curves are vertical, and indeed the AS curve is typically given as vertical, while the theoretical reasons given for presuming that the AD curve should slope downward but not vertically are not particularly good (Fazzari, Ferri, and Greenberg 1998; Lavoie 2010). However, in keeping with the model in this paper, I will permit the gently sloping AD curve in order to make sense of what happens *after* a bout of deflation purportedly restores full employment, as shown in figure 7.

Figure 7: Showing Dynamic Demand Deficiency on an AD/AS Plot
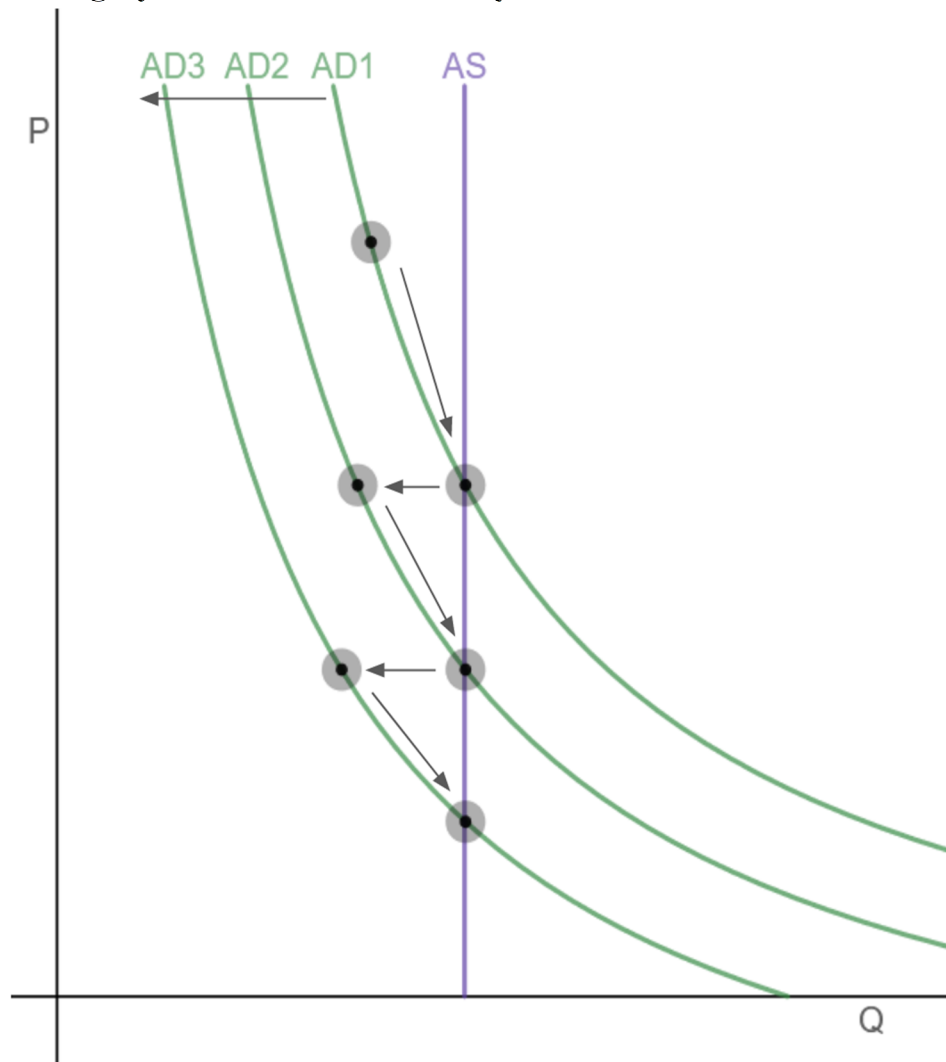
Note: Even allowing for price adjustments that could create full employment in the short term (the gently downward-sloping AD curve), price adjustments cannot ease tight fiscal policy in inflation-adjusted terms if the government purchases a target amount of goods and levies proportional taxes. The ongoing effect of tight fiscal policy on the stock of net financial assets should be a continuous movement of the AD curve to the left.

As we just saw, if fiscal policy is overly tight, then deflation will not be able to loosen it, and in inflation-adjusted terms the surplus isn't affected at all. As we let time run on, this tight fiscal regime drains private net financial wealth, which eventually reduces private spending. This is represented by a continuous movement of the AD curve to the left. But at current prices, aggregate demand falls short of supply, resulting in more deflation to restore full employment. However, this again does nothing to alleviate the government surplus, which, after some time has run its course, again shifts the AD curve to the left. And so on.

In the opposite case, if the economy finds itself with excessive aggregate demand from loose fiscal policy, then a rise in prices can temporarily restore the full employment level of aggregate demand; however it does not eliminate the loose policy (not affecting the deficit at all in inflation-adjusted terms), which continues to increase private financial wealth, resulting in an AD curve that continually moves to the right, returning to the state of excess demand, and so on, as shown in figure 8.

Consider instead the case where prices are fixed. Because inflation-adjusted tax revenue is no longer fixed, there will be one level of private spending that can balance the government's budget, given by

$$\Delta V = G - T = G - \theta(G + S) = 0$$
$$S = \frac{1 - \theta}{\theta} G$$

However now the model is attractive and will indeed come to rest at this level of private spending.[23] On the AD/AS graph, regardless of where the AD curve begins, time passing will prompt the curve to shift until it reaches this particular level of output. There is no necessity that this will be the full employment level of output.

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[23] In this context the model resembles a stripped-down version of model SIM from Godley and Lavoie (2006: chap. 3).

Figure 8: Showing Dynamic Excess Demand on an AD/AS Plot
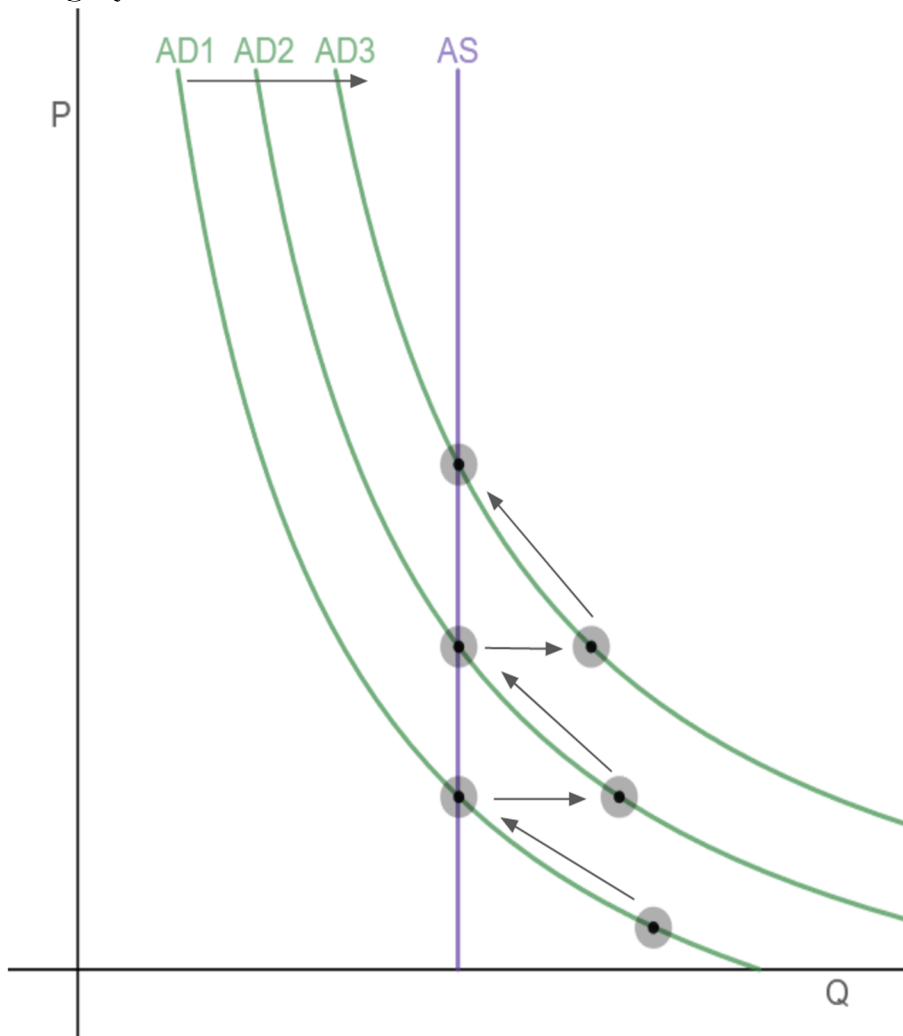
Note: Even allowing for price adjustments that may be able to choke off excess demand in the short term, price adjustments cannot affect the inflation-adjusted budget balance if the government purchases a target quantity of goods and levies proportional taxes. The ongoing effect of loose fiscal policy on the stock of net financial assets should be a continuous movement of the AD curve to the right.
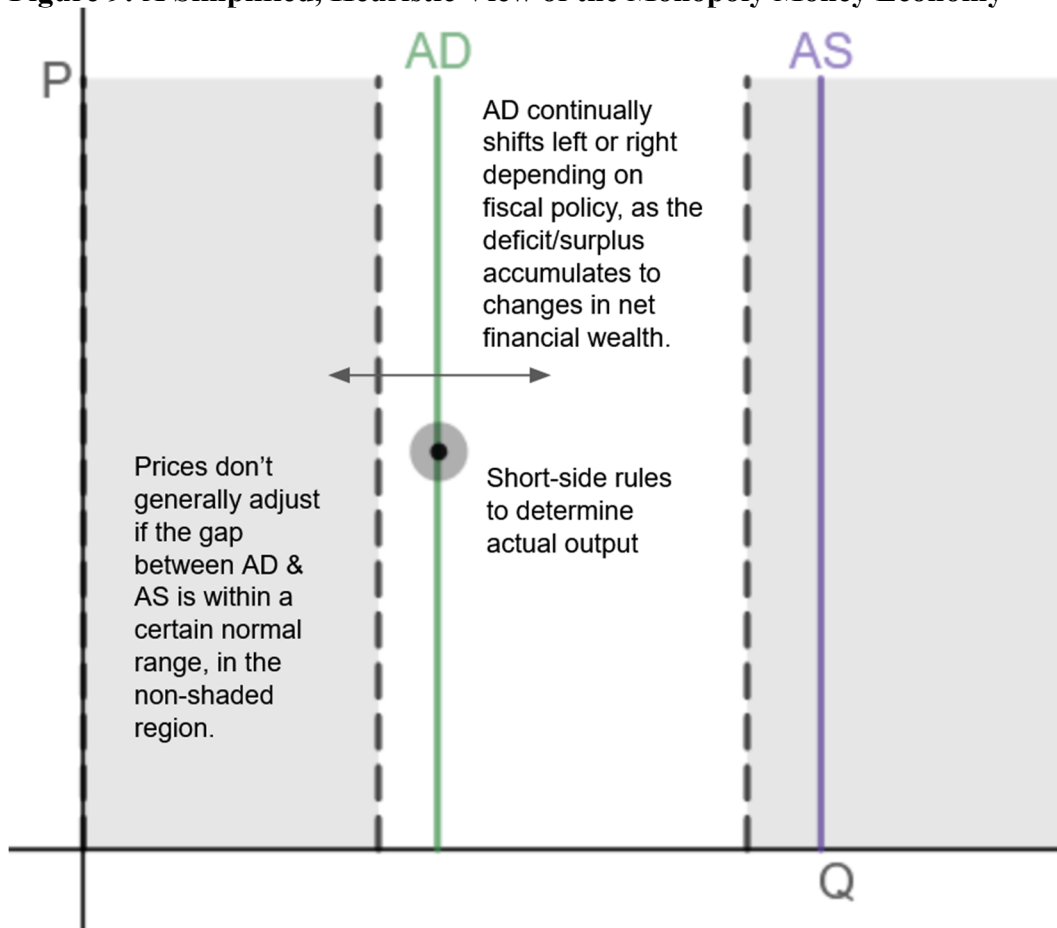
As one last lens through which to view the situation, consider again the aluminum analogy from earlier. Imagine a situation where, analogous to proportional taxation, losses in the recycling process slowly remove aluminum from recirculation. If the production monopolist didn't supply enough to replenish it, then the result would be a continually decreasing stock of aluminum. If prices don't adjust to this reality, then there would be unmet net demand as the stock available to recycle falls, although this reduction in recycling (picture a supply curve moving to the left but prices remaining fixed) would reduce the recycling loss, analogous to taxes falling endogenously to balance the government budget in response to nominal private spending falling. Conversely, if prices were engineered to rise in response to the escalating shortages, then this

32

might alleviate the momentary shortage, but the higher level of recycling and hence recycling losses would accelerate declines in future periods. In other words, only the monopoly producer can solve the problem of escalating shortages of its product.

What about interest rates? Readers may already be sensitive to the idea of a "nominal anchor," and have noticed that the model in section 2 had one when government held fast to its procurement prices, while the models in this section do not. Can the central bank adjusting nominal interest rates to target an inflation rate by impacting private spending supply that anchor? The straightforward way to incorporate the role of interest rates would be to make k dependent on them, but there is reason for pessimism. If a drop in the interest rate increased k, leading to higher spending/employment, this would at best be temporary because the effects of fiscal policy on wealth are ongoing and accumulating. In other words, to use interest rate cuts to offset contractionary fiscal policy would imply not just reducing rates once but continually cutting rates, with the private sector needing to spend an ever-growing proportion of its net income/wealth.

Finally, incorporating administered prices and Keynes's nonsubstitutability of money produces the simplified, heuristic view of the (nongrowing) economy presented in figure 9. The economy finds itself with continually deficient demand, and yet private market governance structures (Tankus and Herrine, forthcoming), or what we can crudely call "sticky prices," prevent this from spiraling into actual deflation. This is not a view of a price system that tends toward stability, but rather a monopolist restricting supply of a product in high demand and private actors stabilizing the situation by insulating prices from the forces of supply and demand. Aggregate demand is deficient even in the long run.

Figure 9: A Simplified, Heuristic View of the Monopoly Money Economy

P

AD

AS

AD continually shifts left or right depending on fiscal policy, as the deficit/surplus accumulates to changes in net financial wealth.

Prices don't generally adjust if the gap between AD & AS is within a certain normal range, in the non-shaded region.

Short-side rules to determine actual output

Q

Note: If no price adjustments can "choke off" the excess demand for money, then the distance between the AS and AD curves should be constant regardless of the price level. Because real-world administered prices do not respond to supply/demand imbalances unless they are very large, the economy can persist with continual deficient demand, with no long-run or trend tendency toward full employment. Chronic looseness or tightness of fiscal policy eventually results in a continually shifting AD curve.

4   CONCLUSION

This paper showed how the state's pricing policies can be instrumental in determining the price level, and how price increases will not generally be able to alleviate deficient aggregate demand if fiscal policy isn't specifically oriented toward doing this. If we add in Keynes's suppositions on the substitutability of money, then we reach the following conclusion: unemployment is not the result of sticky prices, it is the result of fiscal policy. Full employment fiscal policy will produce full employment regardless of what prices do; a lack of full employment fiscal policy will lead to a flailing economy regardless of what prices do, eventually if not immediately.

The preceding analysis has all been that of a heuristic. It assumed a nongrowing economy, ignored inflation caused by rising costs rather than excess demand, presented a determinate rather than stochastic model, ignored changes in monetary policy, and ignored the issue of bank liabilities that are pegged to state money. These elements could be included,[24] however these additions would not change the overall takeaway, which is that private price adjustments cannot be expected to produce stability in that sector of the economy that is built atop public monopoly money.

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[24] Growth in particular could be included by allowing government spending to grow over time, while the demand for money either grows correspondingly or reacts to prior states of the economy in a hysteresis process. Monetary policy can be seen as attempts to influence k.

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