Chapter 15
Monetary-Fiscal Interactions

In this section, we briefly explore some issues surrounding the interactions between monetary policy and fiscal policy. In developed countries, monetary-policy-setting is effectively "independent" from fiscal-policy-setting, in the sense that separate authorities control the two types of policy-making. For example, Federal Reserve policy-makers are not the same as Congressional policy-makers. Even in a country where institutional arrangements seemingly insulate monetary and fiscal policy from each other, however, the conduct of each has bearing on the optimal choices of the other. Casual observation makes this point seem relatively obvious – for example, it is not rare to hear a central bank worry about the implications of fiscal deficits for inflation and its consequences for its own policy-setting.

There are potentially very many ways in which monetary and fiscal policy interact with each other. One way in which interactions between the two are thought about is using game-theoretic tools. In such an approach, fiscal authorities and monetary authorities are viewed as playing a "game" against each other. Microeconomists have developed rich game-theoretic tools to analyze various aspects of such interactions. Another approach to thinking about monetary-fiscal interactions in recent years has its grounding in the dynamic equilibrium models that have become a staple of macroeconomic theory since the RBC revolution. The focus on the analysis in this approach is on a government budget constraint that involves both fiscal and monetary interactions. We sketch the basic idea behind this second way of considering monetary-fiscal interactions. Before even beginning, we point out that using the RBC-dynamic-equilibrium approach to studying monetary-fiscal interactions is in its infancy. The model we touch on here is likely only the beginning of a large field of research yet to be developed in coming years.

In the model, there are two agents: a fiscal authority that controls government spending and taxes, and a monetary authority that controls the money supply. We describe each agent in turn, and then examine how and why they interact with each other, including how which authority gets to "set policy first" has an important effect on the policy choice of the other authority.

The Fiscal Authority's Budget Constraint

To describe the fiscal authority, all we need do is specify its flow budget constraint. In period t, the fiscal authority has a flow budget constraint

$$P_t g_t + B_{t-1}^T = T_t + P_t^b B_t^T + RCB_t. \tag{1.13}$$

From left to right, the terms in this expression are: the nominal amount of government spending (g_t is the real amount of spending); the nominal quantity of government bonds that must be redeemed (i.e., paid back) in period t (which is simply the value of bonds outstanding at the beginning of period t); the lump-sum taxes collected by the government; the nominal value of new bonds sold to the public in period t (each unit of which has nominal price P_t^b); and nominal **receipts from the central bank,** which are the profits earned by the central bank and transferred to the fiscal authority. The notation used is as we've developed throughout the course, except for the slight modification that we denote using B_t^T the **total** government bonds outstanding at the end of period t. We assume, as before, that the face value of each bond is $FV = 1$.

In developed countries, even though the monetary authorities and fiscal authorities are distinct institutions, profits earned by the central bank (from its normal operations as well as from the act of printing money, over which the central bank has control) are turned over to the fiscal authority on a regular basis (on the grounds that the central bank is a non-profit organization and is ultimately chartered by the fiscal authority). These profits that the fiscal authority receives from the monetary authority are captured by the term in RCB_t above. In the above budget constraint, the left-hand-side represents outlays for the fiscal authority in period t, while the right-hand-side represents income items for the fiscal authority in period t.

The Monetary Authority's Budget Constraint

There exists also a monetary authority (a central bank). Its purpose is essentially just to control the nominal supply of money in the economy. In developed countries, the system that has evolved by which a central bank changes the money supply in the economy is to conduct open market operations, in which the central bank trades some of **its** holdings of government (i.e., fiscal-issued) bonds for money. For example, if the Fed wants to increase the supply of money in circulation, it buys some government bonds from the "open market" (hence the term "open-market operations"), for which it exchanges money, thereby increasing the quantity of money in circulation. If the Fed wants to decrease the supply of money in circulation, it does the opposite: it sells some of the government bonds it holds in its asset holdings to the open market, in exchange receiving money from the counterparties to the transactions. The money the Fed thus receives is no longer in circulation.

Denote by B_t^M the monetary authority's holdings of government bonds (as distinct from B_t^T above). The flow budget constraint of the monetary authority is thus

$$P_t^b B_t^M + RCB_t = B_{t-1}^M + M_t - M_{t-1}.$$

The left-hand-side represents outlays of the monetary authority, which consist of purchases of government bonds (that is, even the monetary authority must pay the market price P_t^b to purchase bonds – it is not simply given bonds by the fiscal authority) and the profits that must be turned over the fiscal authority. The right-hand-side represents income for the monetary authority, which consists of maturing bonds B_{t-1}^M, and the printing of new money, which is the term $M_t - M_{t-1}$. As per our usual notation, M_{t-1} is the quantity of money outstanding in the economy at the end of period t-1 (equivalently, at the beginning of period t) and M_t is the quantity of money outstanding in the economy at the end of period t. Thus, $M_t - M_{t-1}$ is the amount by which the nominal money supply changes *during* period t. If $M_t - M_{t-1} > 0$, the central bank printed money during period t, and if $M_t - M_{t-1} < 0$, the central bank removed money from circulation in period t. Changes in the money supply show up on a central bank's balance sheet; as such, they represent income items for the central bank, which thus need to be accounted for in the budget constraint.

From the money authority's budget constraint, it is easy to see that

$$RCB_t = B_{t-1}^M - P_t^b B_t^M + M_t - M_{t-1}$$

is the amount that the monetary authority ends up turning over to the fiscal authority.

Consolidated Government Budget Constraint

Combining the last way of expressing the monetary authority budget constraint with the fiscal authority budget constraint, we have

$$P_t g_t + B_{t-1}^T = T_t + P_t^b B_t^T + B_{t-1}^M - P_t^b B_t^M + M_t - M_{t-1}.$$

Next, define the difference between the total bond issue of the fiscal authority (B_t^T) and the bond holdings of the monetary authority (B_t^M) as the quantity of bonds held by the private sector (denoted by B_t, without superscript). That is, $B_t = B_t^T - B_t^M$ is the quantity of fiscal-issued bonds **not** held by the central bank. B_t represents the net government debt held by the private sector, since bond repayments by the fiscal authority to the monetary authority do not "enter" the private sector. This B_t is what we considered when we studied the MIU model.

With the definition $B_t = B_t^T - B_t^M$, the preceding expression can be rearranged to give

$$P_t g_t + B_{t-1} = T_t + P_t^b B_t + M_t - M_{t-1},$$

which we refer to as the **consolidated government budget constraint (consolidated GBC).** This budget constraint links the activities of the fiscal authority – taxing, spending, and issuing bonds – with the activities of the monetary authority – changing the supply of money. The link fundamentally comes through the RCB that the central bank is required to turn over to the fiscal authority.

The consolidated GBC is a condition which **must** always hold in the economy. It thus makes clear that fiscal policy and monetary policy must be "consistent" with each other, an issue to which we now turn.

Active Fiscal Policy/Passive Monetary Policy

Suppose that when period t arrives, the fiscal authority is able to commit to a particular choice of g_t, T_t, and B_t -- that is, it "picks" a particular combination of spending, taxes, and debt. Suppose further that the fiscal authority makes these choices without heed to the consolidated GBC. Can it simply "ignore" the consolidated GBC when choosing its policy? The answer is yes, because there is another "free variable" in the consolidated GBC: the amount of money outstanding in the economy at the end of period t, M_t, which is under the monetary authority's control. After committing to its particular fiscal policy, the onus is then on the central bank to make the consolidated GBC hold by printing some appropriate quantity of money.

Recall in the introduction we said that game-theoretic concepts are often used to study monetary-fiscal interactions. We can apply a game-theoretic idea to the above scenario: suppose the fiscal authority gets to "move first" (i.e., before the central bank) in that it can choose taxes, spending, and debt before the central bank chooses the money supply. As we just saw, the fiscal authority is then able to force the monetary authority into a particular action because the monetary authority then must see to it that the consolidated GBC is satisfied. In the language that has developed in the field, the scenario just outlined is one in which **fiscal policy is active** (because it gets to "move first" and thus is not constrained in **any** of its choices) and **monetary policy is passive** (because it moves second and its choice is bound by the consolidated GBC). Monetary policy here is essentially just reactive (passive) to fiscal policy.

Active Monetary Policy/Passive Fiscal Policy

Suppose the opposite scenario were true. Suppose it is the monetary authority that gets to "move first" in that it can set whatever money supply M_t it wants (motivated, perhaps, by some inflation stabilization goal, let's say). In this case, the fiscal authority must "react" by setting some appropriate combination of g_t, T_t, and B_t. Here we say that **monetary policy is active** (because it gets to "move first" and thus is not constrained in its choice) and **fiscal policy is passive** (because it moves second and **one of its choices is bound by the consolidated GBC.)**

It may seem that, because the fiscal authority has three instruments at its disposal (spending, taxation, and debt issuance), the fiscal authority is not all that constrained in its decisions. It is constrained, however, compared to the active fiscal policy case considered above. In the active fiscal policy case, the fiscal authority is able to choose **all three** of the instruments g_t, T_t, and B_t freely, knowing that the monetary authority will have to "pick up the slack" by printing some appropriate quantity of money. In contrast, when monetary policy is active, the fiscal authority is able to freely choose only two out of the three instruments g_t, T_t, and B_t: once it has fixed two of them, the third is pinned down by the consolidated GBC.

The Intertemporal Government Budget Constraint

To continue our analysis of fiscal-monetary interactions, let us turn to the consolidated GBC above, which is actually a flow budget constraint, into the lifetime (or intertemporal) government budget constraint, which is the more typical form of the government budget constraint used in analyzing dynamic fiscal-monetary interactions. In transforming the flow GBC into an intertemporal one, we will also along the way introduce important terminology and ideas.

First, take the flow GBC above and divide through by the period-t price level, which gives

$$g_t + \frac{B_{t-1}}{P_t} = \frac{T_t}{P_t} + \frac{P_t^b B_t}{P_t} + \frac{M_t - M_{t-1}}{P_t}.$$

The last term on the right-hand-side, $\frac{M_t - M_{t-1}}{P_t}$, measures the real resources, in units of period-t goods, accruing to the government from the act of money creation: the amount of money created (which could be a negative number, in which money was destroyed – i.e., take out of circulation) during period t is $M_t - M_{t-1}$, and dividing by P_t, which has algebraic units of (time-t dollars/time-t goods), yields the amount of period-t goods the government earns by expanding the money supply (or loses if it contracts the money supply). These real resources are known as **seignorage revenue,** and we will often abbreviate it as sr_t. Formally,

$$sr_t = \frac{M_t - M_{t-1}}{P_t}.$$

Now continue re-arranging the GBC: we can move terms around to arrive at

$$\frac{B_{t-1}}{P_t} = \left(\frac{T_t}{P_t} - g_t + \frac{P_t^b B_t}{P_t} \right) + sr_t.$$

The left-hand-side is the real amount of government debt that comes due at the start of period t, and the right-hand-side is the real amount of (net) revenue the government has. This net revenue comes from monetary sources (the seignorage revenue) and fiscal sources (the difference between tax revenue plus proceeds of new bond sales and government spending).

Defining $t_t \equiv T_t / P_t$ as real tax collections in period t, and $b_t \equiv B_t / P_t$ as the real amount of government debt outstanding at the end of period t, we can express the preceding as

$$\frac{B_{t-1}}{P_t} = sr_t + \left(t_t - g_t + P_t^b b_t\right)$$

This expression is of course simply still the period-t GBC. The period-t+1 GBC is analogous,

$$\frac{B_t}{P_{t+1}} = sr_{t+1} + \left(t_{t+1} - g_{t+1} + P_{t+1}^b b_{t+1}\right).$$

The objective of the next several algebraic rearrangements we will go through is to replace the b_t term in the **period-t GBC** using the **period-t+1 GBC.** First, multiply both sides by P_{t+1}, giving

$$B_t = P_{t+1} sr_{t+1} + \left(P_{t+1} t_{t+1} - P_{t+1} g_{t+1} + P_{t+1}^b P_{t+1} b_{t+1}\right).$$

Next, divide both sides by P_t to obtain

$$\frac{B_t}{P_t} = \frac{P_{t+1} sr_{t+1}}{P_t} + \left(\frac{P_{t+1} t_{t+1}}{P_t} - \frac{P_{t+1} g_{t+1}}{P_t} + \frac{P_{t+1}^b P_{t+1} b_{t+1}}{P_t}\right).$$

The left-hand-side, by our definitions, is simply b_t. Also, recall, from our earlier study of the dynamic models, that inflation between period t and t+1 is defined by $\pi_{t+1} \equiv \frac{P_{t+1} - P_t}{P_t}$, which means that $1 + \pi_{t+1} = \frac{P_{t+1}}{P_t}$. Using these definitions in the last expression, we have

$$b_t = (1+\pi_{t+1}) sr_{t+1} + \left((1+\pi_{t+1}) t_{t+1} - (1+\pi_{t+1}) g_{t+1} + P_{t+1}^b (1+\pi_{t+1}) b_{t+1}\right),$$

which, despite all the manipulations, is still just the period-t+1 GBC. Finally, we are ready to insert this into the period-t flow GBC from several steps ago; doing so gives us

$$\frac{B_{t-1}}{P_t} = sr_t + \left[t_t - g_t + P_t^b \left((1+\pi_{t+1}) sr_{t+1} + \left((1+\pi_{t+1}) t_{t+1} - (1+\pi_{t+1}) g_{t+1} + P_{t+1}^b (1+\pi_{t+1}) b_{t+1}\right)\right)\right].$$

Pulling the $(1+\pi_{t+1})$ terms together,

$$\frac{B_{t-1}}{P_t} = sr_t + \left[t_t - g_t + P_t^b (1+\pi_{t+1}) \left(sr_{t+1} + \left(t_{t+1} - g_{t+1} + P_{t+1}^b b_{t+1}\right)\right)\right],$$

and then cleverly grouping the seignorage terms together and the fiscal terms together,

$$\frac{B_{t-1}}{P_t} = \left[sr_t + P_t^b(1+\pi_{t+1})sr_{t+1} \right] + \left[(t_t - g_t) + P_t^b(1+\pi_{t+1})(t_{t+1} - g_{t+1}) \right] + P_t^b(1+\pi_{t+1})P_{t+1}^b b_{t+1}.$$

Recall from the MIU model (or, indeed, any monetary model) the relation between the nominal price of a bond and the nominal interest rate, $P_t^b = \frac{1}{1+i_t}$; also recall the Fisher equation, $1+r_t = \frac{1+i_t}{1+\pi_{t+1}}$. These two facts imply that, in the last equation, $P_t^b(1+\pi_{t+1}) = \frac{1+\pi_{t+1}}{1+i_t} = \frac{1}{1+r_t}$. Replacing the $P_t^b(1+\pi_{t+1})$ in the last equation using this, the period-t GBC can be written

$$\frac{B_{t-1}}{P_t} = \left[sr_t + \frac{sr_{t+1}}{1+r_t} \right] + \left[(t_t - g_t) + \left(\frac{t_{t+1} - g_{t+1}}{1+r_t} \right) \right] + \frac{P_{t+1}^b b_{t+1}}{1+r_t}.$$

Notice that in this representation of the period-t GBC, seignorage revenue, tax revenue, and government spending in **both periods t and t+1** appear. If we were to substitute out the b_{t+1} term on the far right of the last expression using the **period-t+2 GBC,** we would have

$$\frac{B_{t-1}}{P_t} = \left[sr_t + \frac{sr_{t+1}}{1+r_t} + \frac{sr_{t+2}}{(1+r_t)(1+r_{t+1})} \right] + \left[(t_t - g_t) + \left(\frac{t_{t+1} - g_{t+1}}{1+r_t} \right) + \left(\frac{t_{t+2} - g_{t+2}}{(1+r_t)(1+r_{t+1})} \right) \right] + \frac{P_{t+2}^b b_{t+2}}{(1+r_t)(1+r_{t+1})}$$

after going through a similar set of algebraic rearrangements.[114] If we then substituted out b_{t+2} using the period-t+3 GBC, and then continued successively substituting out future real bond terms using successive flow GBCs, we would ultimately arrive at the infinite-period version of the GBC,

$$\frac{B_{t-1}}{P_t} = \sum_{s=0}^{\infty} \left[\frac{sr_{t+s}}{\prod_{s=0}^{\infty}(1+r_{t+s})} + \frac{t_{t+s} - g_{t+s}}{\prod_{s=0}^{\infty}(1+r_{t+s})} \right],$$

[114] Tedious, yes, but perhaps worthwhile for you to trace through yourself to convince yourself that this is in fact correct.

which, note well, involves both an infinite product and an infinite summation.[115] The successively growing products – the first term of which is $\frac{1}{1+r_t}$, the second term of which is $\frac{1}{(1+r_t)(1+r_{t+1})}$, the third term of which is $\frac{1}{(1+r_t)(1+r_{t+1})(1+r_{t+2})}$, and so on – are discount factors.[116] We will refer to this last expression as the **intertemporal government budget constraint,** which is an infinite-period version of the flow GBC obtained by chaining together *all* of the flow GBCs from period t on into the infinite future.

Note that the right-hand-side of the intertemporal GBC is a function of all current (period-t) and future seignorage revenue (which stems from money creation, which is in the province of the monetary authority) as well as all current and future **primary budget surpluses** (which is the difference between tax collections and government spending and is in the province of the fiscal authority). There are a host of macroeconomic implications of the intertemporal GBC, a few of which we turn to now. In the following, we essentially just take alternative views on the intertemporal GBC, in the sense that we treat some parts of it as "fixed" and ask what other parts of it "must adjust" in order to make it hold with equality.

Before proceeding, we define one more notion: a **non-Ricardian fiscal policy** is a policy by the fiscal authority (which, again, controls taxation and government spending) in which the current and future path of "regular" fiscal instruments (i.e., taxes and spending) is **not** adjusted to ensure that the intertemporal GBC holds (or, in the terminology common in this field, to ensure that "intertemporal solvency holds"). Loosely speaking, if the fiscal authority is running a non-Ricardian fiscal policy, it does not "care" about or pay heed to the needs of intertemporal solvency when setting its current and future policy instruments.

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[115] Technically, if you do several steps of the forward substitutions and let time go to infinity, you will see that there is actually another term on the right-hand-side, $\lim_{s\to\infty}\left[\frac{P^b_{t+s}b_{t+s}}{\prod_{s=0}^{\infty}(1+r_{t+s})}\right]$. A technical condition that must be imposed in any well-specified dynamic macro model (including ours) is that this limit is zero, hence the infinite-period GBC above is correct. This limit being zero is the infinite-period analog of the restriction from our very simple two-period model that $A_2 = 0$. Whether in the two-period case or the infinite-period case here, this so-called "No-Ponzi" condition just states, essentially, that the value of assets at the end of the economy are zero (whether the end be at the end of period 2 or at the end of "period infinity"). Analyzing this No-Ponzi restriction further is outside our scope and is better left to a more advanced course in macroeconomic theory.

[116] Recall from our infinite-period model that in steady-state, $\frac{1}{\beta} = 1+r$, which means $\beta = \frac{1}{1+r}$. Our interpretation of β was that it was consumers' discount factor (i.e., a measure of their impatience). Hence the terminology here.

By contrast, a **Ricardian fiscal policy** is then one in which the fiscal authority does pay heed to the intertemporal GBC when setting current and future policy. Under a Ricardian fiscal policy, the fiscal authority views itself as being constrained by the intertemporal GBC (i.e., it believes that its actions must be consistent with it), while under a non-Ricardian fiscal policy it does not view itself as being constrained by the intertemporal GBC. Whether or the fiscal authority believes it "must" satisfy its budget constraint is likely an issue we cannot resolve, because in the end, as we will now see, the (intertemporal) government budget constraint **is** satisfied – the bite comes in *which prices and/or quantities must adjust to ensure that it is satisfied.*

In all that follows, the analysis is based on the intertemporal government budget constraint, which we reproduce here for convenience:

$$\frac{B_{t-1}}{P_t} = \sum_{s=0}^{\infty}\left[\frac{sr_{t+s}}{\prod_{s=0}^{\infty}(1+r_{t+s})} + \frac{t_{t+s}-g_{t+s}}{\prod_{s=0}^{\infty}(1+r_{t+s})}\right]$$

A Fiscal Theory of Inflation

Entering period t, the nominal debt stock B_{t-1} is fixed – that is, it cannot be changed (let's assume no default) and hence **is** the nominal debt the government must repay at the start of period t. Suppose that the monetary authority, through its control of the money supply, is perfectly able to control and commit to a path through time of seignorage revenue starting from date t onwards. That is, suppose the monetary authority is able to credibly commit itself to a sequence of seignorage revenue into the infinite future, $(sr_t, sr_{t+1}, sr_{t+2}, sr_{t+3}, ...)$. Finally, also suppose that it is monetary factors that (effectively) determine the price level in period t, so that once the central bank has "announced" its monetary policy (which, here, takes the form of the "announcement" of its path of seignorage), the price level P_t becomes fixed.

With these policy and market arrangements in place, fiscal policy, through its sequence of current and future **primary fiscal surpluses** (which, after all, is what the sequence of $(t_t - g_t)$ terms represents) must be set so as to satisfy the intertemporal government budget constraint. Relating this to the notions developed above, fiscal policy here can be viewed as passive: any changes in what the monetary authority is doing in terms of generating seignorage and/or any changes in the price level P_t must be met by a reaction by fiscal authorities to ensure intertemporal solvency.

On the other hand, the active power could reside with the fiscal authority; the fiscal authority could "independently" (in our earlier terminology, "actively") set its path of $(t_t - g_t)$. If it is still the case that P_t is determined by factors other than the intertemporal government budget constraint, then active fiscal policy requires that the path of seignorage revenue adjusts to ensure intertemporal government solvency. Note that, viewed through the lens of the intertemporal government budget constraint, it is not necessarily the case that **current** (period-t) money creation must change if there is a change in period t primary fiscal policy, but rather that **current and/or future** seignorage generation must change.[117]

Current or future seignorage generation – which is fuelled by money creation – ultimately means (higher or lower) inflation, so long as we believe that a quantity-theoretic link operates between money growth and inflation – the cash-in-advance model, to take one example, builds in the view that indeed such a link exists, at least in the long run. Hence, with active fiscal policy and a fixed period-t nominal price level P_t, the intertemporal government budget constraint articulates a **fiscal theory of inflation.** This is nothing more than a slightly-more careful restatement of our earlier active/passive distinctions: if the fiscal authority does not balance the government budget constraint, then it falls on the monetary authority to do so. Monetary policy actions, in turn, have consequences for inflation, but because these actions themselves were induced by fiscal policy, this is ultimately a *fiscal* theory of inflation, even though the proximate cause of the inflation was "money creation."

A Fiscal Theory of the Price Level

What if in the scenario just outlined of an active fiscal policy, the monetary authority did not "blink?" What if instead, the central bank was strong enough/credible enough/committed enough to its own "independent" monetary policy (presumably guided by some welfare maximization ideas in the background) that it refuses to be induced to money creation/destruction by fiscal policies. The intertemporal government budget constraint *must* be satisfied *somehow.* But how, if neither authority "reacts" to make it hold?

The answer lies in the market-determined price level P_t. In our above discussion of the *fiscal theory of inflation,* we took the stand that "P_t is determined by factors other than the intertemporal government budget constraint." But if neither regular fiscal policy nor monetary policy adjusts appropriately, then it must be that P_t (which, after all, is not set in stone at the beginning of period t unless prices are "completely sticky") adjusts to satisfy the intertemporal budget constraint, for a given B_{t-1}.[118]

[117] If it is not the case that current-period seignorage changes, it must be that the government debt position between t and t+1 absorbs the change – but of course, as in any intertemporal budget constraint, "intermediate" asset positions do not appear, only initial asset positions.

[118] There is another option, of course, one alluded to above: it could be that the government reneges on the promised B_{t-1}, i.e., it could be that the government defaults on (part of) its nominal debt. Such an

To make the discussion a bit more concrete, suppose that, relative to its original plans for the sequence of $(t_{t+s} - g_{t+s})_{s=0}^{\infty}$, the fiscal authority decides to lower $(t_t - g_t)$ but leaves $(t_{t+s} - g_{t+s})_{s=1}^{\infty}$ (note carefully the time indexes here!) unchanged. That is, suppose the government decides to lower the primary fiscal surplus in period t, but leave all future surpluses unchanged. Now also suppose that the "independent" central bank remains committed to its plan for the money stock, which means it will not be induced to deviate from its plan for the sequence sr_{t+s}, $s = 0,1,2,...,\infty$.

The government cannot/does not default on its nominal debt repayment obligation B_{t-1}. The only way, then, for the intertemporal GBC to hold is for the **period-t price level** P_t **to rise**; it must rise because the right-hand-side of the intertemporal GBC has fallen (due to the reduced primary fiscal surplus in period t), which requires that the left-hand-side falls, too. With B_{t-1} fixed, this requires a rise in the price level in the current period. This mechanism, by which a change in fiscal policy translates into a direct change in P_t is termed the **fiscal theory of the price level.**

We might want to say that in this case a change in fiscal policy resulted in inflation because it caused a rise in P_t. Viewed this way, seems to be little difference between the *fiscal theory of the price level* and the *fiscal theory of inflation.* The distinction is subtle, yet important. Under the fiscal theory of the price level, any "shock" (i.e., a change in fiscal policy unanticipated by markets) translates *immediately and fully* into a *one-time* change in the nominal price level. If fiscal policy never changes again, there need be no future unanticipated changed in the nominal price level. On the other hand, under the fiscal theory of inflation, the period-t price level has nothing to do with fiscal policy from period-t onwards; instead, a change in current or future fiscal policy translates into a change in money creation *at some time in the present or future,* implying *additional inflation in the future.*

In some sense, the fiscal theory of inflation and the fiscal theory of the price level are the polar opposite theories. The former effectively states that surprise changes in fiscal policy leads *only to future changes in inflation, but current inflation is unaffected.* The latter effectively states that surprise changes in fiscal policy leads *only to changes in current inflation, but future inflation is unaffected.* In reality, one might (probably naturally) expect that fiscal pressures are relieved through both channels – that surprise changes in fiscal policy lead to changes in both current and future inflation. Such a division of fiscal pressure on nominal prices into current pressure versus future pressure is in practice hard to disentangle, and, indeed, probably plays out in different ways in different countries and in different time periods. It is good to understand, though, the

adjustment may in fact be a very relevant one to consider for developing countries, in which debt defaults are not that uncommon. For the government of a country such as the United States, however, which has never defaulted on its debt, this situation may be less relevant a description of reality.

underlying tensions present; the tensions are articulated in the fiscal theory of inflation and the fiscal theory of the price level.