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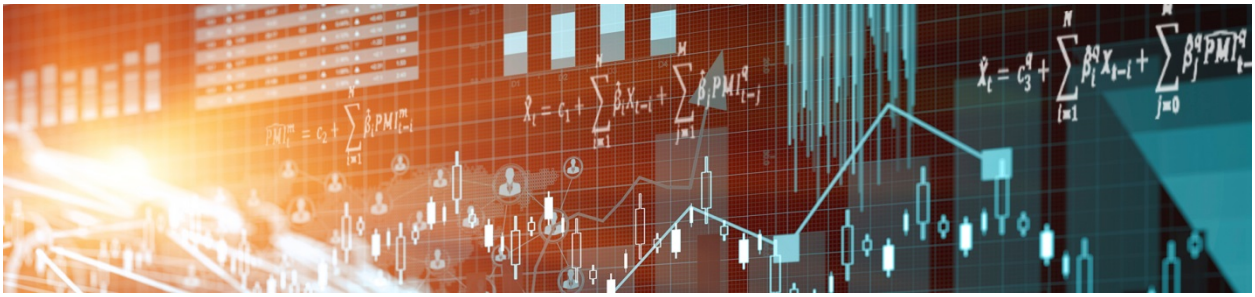

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Abstract

What path should policy-makers select for the nominal rate when faced with a liquidity trap during which the effective lower bound binds? Conventional wisdom has generally favoured a commitment to keep rates low for long, namely under the guise of forward guidance policies, while Cochrane (2016) and others have recently made the case for neo-Fisherian policies that involve pegging rates at a high level in the hopes that the Fisher effect might deliver higher inflation over time. We compare these two options as strategies for escaping liquidity traps and argue that their relative merits likely depend on the mechanism that initially gave rise to the particular trap in question. More specifically, we argue that policy-makers should distinguish between "shock-based" traps that arise following large, negative demand shocks (Eggertsson and Woodford 2003) and "expectation-based" traps that arise from self-fulfilling shifts in private sector expectations (Benhabib, Schmitt-Grohe and Uribe 2001). This is because forward guidance likely dominates in the former case, while the latter may favour neo-Fisherianism to the extent that keeping rates low for long might reinforce the pessimistic beliefs underlying expectation-based traps. Although empirical strategies for distinguishing between these two mechanisms would be a promising topic for future research, we conclude by arguing that the shock-based mechanism likely provides a more plausible explanation for the low inflation witnessed in many developed countries during and after the Great Recession.

Bank topics: Central bank research; Economic models; Inflation and prices; Interest rates; Monetary policy framework; Transmission of monetary policy
JEL codes: E4; E5

Résumé

Quelle trajectoire les banquiers centraux devraient-ils choisir pour le taux nominal lorsqu'ils sont confrontés à une trappe à liquidité qui se produit dans un contexte marqué par la contrainte de la valeur plancher? Il était jusqu'ici admis que les banques centrales devaient s'engager à garder les taux bas sur une longue période (plus particulièrement en utilisant des indications prospectives). Or, Cochrane (2016) et d'autres chercheurs ont préconisé récemment des politiques néo-fishériennes qui fixent les taux à un niveau élevé, dans l'espoir que l'effet Fisher entraîne à terme une hausse de l'inflation. Nous comparons l'utilisation de ces deux stratégies proposées afin de faire sortir l'économie d'une trappe à liquidité : nous soutenons que leurs atouts respectifs dépendent vraisemblablement du mécanisme à l'origine de la trappe. Plus précisément, nous montrons que les banquiers centraux devraient différencier les trappes issues d'un choc, qui suivent des chocs de demande négatifs importants (Eggertsson et Woodford, 2003), et les trappes issues des anticipations, qui naissent d'un retournement autoréalisateur des anticipations du secteur privé (Benhabib et autres, 2001). Cette distinction s'avère nécessaire parce que les indications prospectives sont probablement la meilleure stratégie dans le premier cas, alors que le second cas de figure plaiderait en faveur d'une stratégie

néo-fishérienne, dans la mesure où le fait de maintenir des taux bas sur une longue période pourrait conforter les croyances pessimistes à la base d'une trappe à liquidité issue des anticipations. Les stratégies empiriques qui aident à différencier ces deux mécanismes offrent une avenue prometteuse pour la recherche; cependant, nous montrons pour conclure que la trappe à liquidité issue d'un choc constitue probablement une explication plus plausible de la faible inflation observée dans bon nombre de pays développés au cours de la Grande Récession et après.

Sujets : Recherches menées par les banques centrales; Modèles économiques; Inflation et prix; Taux d'intérêt; Cadre de la politique monétaire; Transmission de la politique monétaire
Codes JEL : E4; E5

1. Introduction

What path should policy-makers select for the nominal rate when faced with a liquidity trap during which the effective lower bound binds? Conventional wisdom has generally favoured a commitment to keep rates low for long, namely under the guise of forward guidance (Eggertsson and Woodford 2003). However, a small but growing portion of the profession has recently made the case for neo-Fisherian policies that involve pegging rates at a relatively high level in the hopes that the Fisher effect might deliver higher inflation over time (Bullard 2015; Cochrane 2016; Schmitt-Grohe and Uribe, forthcoming). In this note, we compare these two policy options and identify conditions under which one should likely be favoured over the other. The exercise is intended to complement our previous note (Amano, Carter and Mendes 2016), which considered neo-Fisherianism in isolation, in the context of a simple model that abstracted from the possibility of liquidity traps.

Our main conclusions can be summarized as follows:

- The relative merits of forward guidance and neo-Fisherianism as strategies for escaping a liquidity trap likely depend on the mechanism that initially gave rise to the trap in question.[1] In particular, policy-makers should distinguish between "shock-based" traps that arise following demand shocks large enough to force nominal rates to their effective lower bound (Eggertsson and Woodford 2003) and "expectation-based" traps that arise from self-fulfilling shifts in private sector expectations (Benhabib, Schmitt-Grohe and Uribe 2001).

- In the case of shock-based traps, we argue that forward guidance dominates neo-Fisherianism. More specifically, we show that both approaches can, in principle, be rationalized using a simple Eggertsson and Woodford-style model. However, the conditions under which this model favours neo-Fisherianism necessarily include a very long-lived suspension of the Taylor principle and a high degree of fiscal-monetary coordination. Both conditions entail significant challenges, the latter especially from a political-economic perspective.

- In the case of expectation-based traps, the balance of the comparison between forward guidance and neo-Fisherianism may reverse. This is because forward guidance may reinforce the pessimistic expectations underlying these traps, since low-for-long rates are also consistent with low inflation as a permanent outcome.

- With respect to the relative plausibility of these two trap mechanisms, we argue that the shock-based mechanism likely provides a more plausible explanation for the low inflation witnessed in many developed countries during and after the Great Recession. For this reason, the shock-based mechanism deserves a strong prior in current policy analyses.

[1] Throughout this note, we use the term "liquidity trap" to describe a situation in which the nominal rate dictated by a standard Taylor rule is incompatible with the effective lower bound.

The remainder of the note is organized as follows. Section two compares forward guidance and neo-Fisherianism as strategies for escaping shock-based traps. Section three repeats this comparison for expectation-based traps, while section four considers the relative plausibility of these two trap mechanisms. Section five concludes.

2. Forward Guidance Versus Neo-Fisherianism when Escaping Shock-Based Traps

To compare forward guidance and neo-Fisherianism as strategies for escaping shock-based traps, we nest both approaches inside a model similar to that of Eggertsson and Woodford (2003), which is the canonical reference for traps of this type.

The model begins by assuming a standard New Keynesian Phillips curve and IS curve. As in Eggertsson and Woodford, the IS curve includes a large, negative demand shock that arrives at $\boldsymbol{t = 0}$ and then persists with probability $\boldsymbol{p}$ at each date thereafter. In response, proponents of forward guidance would argue that the central bank should commit to peg nominal rates at or near the effective lower bound (ELB) for an extended period, potentially including some time after the shock has dissipated. In contrast, neo-Fisherians would argue for committing to a relatively high peg. We nest both approaches by assuming that the central bank pegs nominal rates at some level $\bar{\boldsymbol{\imath}}$ for the full duration of the shock and then maintains this peg with probability $\boldsymbol{q}$ at each date thereafter. The peg is then finally replaced with a more standard policy under which the Taylor principle holds.[2]

In the appendix, we argue that a "two-stage" monetary policy of this sort should be able to keep inflation on target throughout the post-peg period.[3] However, it would seem to leave room for multiple equilibria during the period when rates are pegged, since pegging is incompatible with the Taylor principle. Indeed, we find that multiplicity can arise depending on the duration of the peg, as measured by the parameter $\boldsymbol{q}$: if the peg isn't too long-lived, then agents' anticipation that the central bank will *eventually* get inflation on target strongly anchors their expectations during the period that rates are pegged, resulting in a unique path for output and inflation; otherwise, this anchoring effect is too weak to ensure uniqueness.

The relative merits of forward guidance and neo-Fisherianism depend critically on which of these two cases is most relevant. Suppose, for example, that the peg-duration parameter $\boldsymbol{q}$ is low enough to ensure uniqueness. In this case, we find that the model unambiguously favours forward guidance. More specifically, we find that lower choices on the peg-level parameter $\bar{\boldsymbol{\imath}}$ exert an unambiguously inflationary

[2] A similar exercise appears in Carlstrom, Fuerst and Paustian (2015).
[3] More specifically, we show that the central bank should be able to keep inflation on target throughout the post-peg period as long as it (i) obeys the Taylor principle and (ii) has recourse to implicit or explicit "escape clauses" that activate when inflation strays very far from target, as advocated by Obstfeld and Rogoff (1983); see also Christiano and Rostagno (2001) and Atkeson et al. (2010). Duarte (2016) considers the more complicated case where the central bank doesn't have access to escape clauses and thus faces some risk of falling back to the ELB even after the shock has dissipated.

effect throughout the period that rates are pegged, consistent with conventional views on monetary policy transmission. **Figure 1** illustrates this effect by comparing time paths for inflation under two distinct choices on the peg level.

For longer-lived pegs, the analysis is complicated by the presence of multiple equilibria. We've illustrated this problem in **Figure 2**, which compares one of the equilibria associated with a relatively low peg against two associated with a relatively high peg. In this figure, we see that the effects of an increase in $\bar{\imath}$ depend on the particular equilibrium under which the experiment ends. As explained in our previous work (Amano, Carter and Mendes 2016), the fiscal theory of the price level (Woodford 1995) is normally used to resolve this ambiguity. Put briefly, this theory predicts that fiscal authorities can choose the particular equilibrium on which the economy settles following an increase in the peg-level parameter $\bar{\imath}$, namely by adjusting the path for real primary surpluses in response to this change.[4] In particular, appropriate adjustments could place the economy in a high-inflation equilibrium following an increase in $\bar{\imath}$, consistent with the neo-Fisherian view. However, ensuring that fiscal authorities follow through would then entail a host of political-economic challenges. Our previous work already described these challenges in some detail, so we will not elaborate further in this note.

To summarize, our simple model can, in principle, rationalize both forward guidance and neo-Fisherianism, but the two entail different assumptions on peg duration and the level of fiscal-monetary coordination. More specifically: (i) although both approaches involve nominal-rate pegs and thus entail some departure from the Taylor principle, the necessary departure is longer lived under the neo-Fisherian approach; and (ii) while forward guidance can achieve equilibrium uniqueness through an expectation that monetary policy will *eventually* re-normalize in the not-too-distant future, neo-Fisherianism relies on a fiscal-theory mechanism that effectively delegates control over nominal prices to fiscal authorities, thus raising serious political-economic concerns. Both these considerations strongly support forward guidance when dealing with shock-based traps.

[4] More specifically, the fiscal theory recognizes that any expansion in the government's nominal liabilities triggered by higher nominal rates will have to be offset by inflation if not met by a combination of higher taxes and/or reduced spending, since the government's real ability to service its debts would then remain unchanged. To understand the underlying mechanism, note that the government faces an intertemporal budget constraint (ITBC) equating the real value of its debt with the real present value of its future surpluses:

$$\frac{B_{-1}}{P_0} = s_0 + \frac{s_1}{1+r_0} + \frac{s_2}{(1+r_0)(1+r_1)} + \cdots = s_0 + \frac{s_1}{1+i_0-\pi_1} + \frac{s_2}{(1+i_0-\pi_1)(1+i_1-\pi_2)} + \cdots \qquad \text{(ITBC)},$$

where B_{-1} denotes the government's initial nominal debt, P_0 denotes the current price level, and $(s_0, s_1, \ldots)$ denotes the stream of real primary surpluses that the government plans to achieve. In conventional models, along with all of the analysis above, it's implicitly assumed that fiscal policy is Ricardian in the sense that the government chooses surpluses to balance this equation, taking nominal prices and rates as given. In contrast, the fiscal theory allows for the possibility that the government might, for example, opt not to adjust surpluses in response to a higher peg-level parameter $\bar{\imath}$, in which case the right-hand side of (ITBC) would fall, all else being equal. Since surpluses include households' future tax liabilities, wealth effects would then lead households to increase demand, driving prices up until (ITBC) rebalances. Wealth effects of this sort, which Ricardian fiscal policy assumes away, could thus dominate conventional transmission channels to deliver a neo-Fisherian link from higher $\bar{\imath}$ to higher inflation, assuming that the government either abstains from surplus adjustment or actively targets lower surpluses in coordination with the central bank.

3. Forward Guidance Versus Neo-Fisherianism when Escaping Expectation-Based Traps

While the shock-based view on the origin of liquidity traps is very common in the New Keynesian literature, several authors have advocated an alternative view that de-emphasizes shocks and instead treats traps as the result of self-fulfilling shifts in private sector expectations. In this section, we argue that this expectation-based mechanism may alter the balance of the comparison between forward guidance and neo-Fisherianism.

The canonical reference for expectation-based traps is Benhabib, Schmitt and Uribe (2001). Their basic insight can be illustrated by assuming that the central bank obeys a truncated Taylor rule of form

$$\boldsymbol{i_t = \max\{i^{ELB}, r^* + \pi^* + \phi_\pi(\pi_t - \pi^*)\}}, \qquad (1)$$

where $\boldsymbol{i^{ELB} \leq 0}$ denotes the ELB, with $\boldsymbol{\phi_\pi > 1}$. **Figure 3** illustrates this scenario by plotting equation (1) against the steady-state version of the Fisher equation. From this figure, we see that the model now admits two steady-state equilibria: a "good" steady state with inflation on target and a "bad" steady state with a binding ELB and deflation at rate $\boldsymbol{\pi^{ELB} \equiv i^{ELB} - r^* < 0}$. This multiplicity implies that liquidity traps could arise purely as a consequence of changing expectations rather than a shock to the economy's fundamentals: an economy operating at the good steady state could suddenly jump to the bad steady state merely because agents came to expect deflation and then adjusted their price-setting choices in a way that made this expectation self-fulfilling.

Although illustrated in the context of a simple flexible-price model, this multiplicity problem generalizes to a wide range of models. It's also more severe than the preceding analysis would suggest, since non-steady-state equilibria are also possible. In the context of our simple model, we show in the appendix that these equilibria tend to exhibit divergence (convergence) in regions where the Taylor principle holds (fails), as illustrated by the arrows in Figure 3. As a result, these regions include "escape paths" under which inflation initially deviates to a point only slightly less than $\boldsymbol{\pi^*}$ but nonetheless converges to $\boldsymbol{\pi^{ELB}}$ over time. Escape paths of this sort also exist in Benhabib, Schmitt and Uribe (2001) and much of the literature following it, although the analysis in these papers is more complicated.

How should monetary policy react when a shift toward more pessimistic expectations places the economy on one of these escape paths—or worse, directly at the bad steady state? Bullard (2010) forcefully, though informally, argues that forward guidance could merely reinforce the private sector's expectations, since low interest rates are also consistent with the bad steady state as a permanent outcome. In contrast, a neo-Fisherian commitment to hike nominal rates when inflation falls beneath some threshold could lead to a situation similar to that shown in **Figure 4**, with the uniqueness of the good steady state now restored, and this could help to re-anchor private sector expectations. Schmitt-Grohe and Uribe (forthcoming) have formalized this last notion to some extent, although we're unaware of any formal treatment for the link between forward guidance and expectation-driven traps. This link thus strikes us as a very promising topic for future research.

Regardless, we now see that the appropriate strategy for escaping a liquidity trap likely depends on the mechanism underlying the trap, with the expectation-driven mechanism potentially favouring neo-Fisherianism over forward guidance, even though the former would still suffer from the political-economic weaknesses identified in our previous section.

4. Plausibility of Shock-Based Versus Expectation-Based Traps

The foregoing discussion clearly places high value on policy-makers' ability to identify the mechanism underlying a given liquidity trap, since different mechanisms likely favour different escape strategies. On this front, we argue that the shock-based mechanism seems to provide a more plausible explanation for the low inflation witnessed in many developed countries during and after the Great Recession. For this reason, it likely deserves a strong prior in current policy analyses.

Our argument to this effect has both empirical and theoretical components. On the empirical side, we note that all of the undesirable equilibria arising in the expectation-based mechanism involve long-run deflation, which is difficult to reconcile with the fact that inflation expectations in most countries remained positive throughout the Great Recession. Further empirical support comes from Aruoba, Cuba-Borda and Schorfheide (2013), who build and estimate a medium-scale model in which liquidity traps can arise through both shock- and expectation-based mechanisms. Their main finding is that the model, when estimated using US data, strongly favours the shock-based mechanism throughout the Great Recession and its aftermath.

On the theoretical side, we further note that jumps from one equilibrium to another involve rapid revisions in private sector expectations, including some having to do with very distant horizons. As a result, the expectation-based mechanism relies heavily on an assumption of rational expectations and can be shown to weaken dramatically in learning models that relax this assumption (Evans and Honkapohja 2005; Evans, Guse and Honkapohja 2008).[5]

[5] The main results in Evans and Honkapohja (2005) and Evans, Guse and Honkapohja (2008) can be summarized as follows: (i) the good steady state is stable under learning, meaning that the economy will tend to converge to this state over time as long as agents' initial expectations place them somewhere in its general neighbourhood; on the other hand, (ii) the bad steady state is not stable under learning, meaning that the economy would only reach this state if agents' initial expectations place them exactly on it. Result (i) rules out escape paths of the sort described in the main text, while (ii) has led many authors to treat the bad steady state as a mere theoretical curiosum—to borrow an analogy from Christiano, Eichenbaum and Johannsen (2016):

> [A pencil on a tabletop] has two equilibria. It can lay on its side on the table or it can stand on its head. The second equilibrium, which no doubt exists, has never been observed…because the slightest deviation from it causes the pencil's position to diverge from the second equilibrium. For this reason, the second equilibrium is uninteresting and can (perhaps!) be ignored.

That said, (i) is silent on the case where agents' initial expectations place them far outside the neighbourhood of the good steady state. Indeed, Evans and Honkapohja (2005) and Evans, Guse and Honkapohja (2008) both find that expectations of this sort could lead to deflationary spirals. Though multiplicity thus remains an issue in these settings, (i) and (ii) together make the problem much less acute than would be the case under pure rational expectations.

Of course, none of these considerations dismiss the expectation-based mechanism. On the contrary, Aruoba, Cuba-Borda and Schorfheide (2013) identify several years during which their model favours this mechanism when re-estimated using Japanese data. Smith (2006) also identifies several historical deflations that seem consistent with the expectation-based mechanism. Finally, one could easily imagine a scenario in which both mechanisms operate—for example, an initial shock to fundamentals might precipitate a shift in expectations that subsequently becomes self-fulfilling. However, on balance, recent experience in most developed economies seems to favour the shock-based mechanism.

5. Conclusion

In this note, we compared forward guidance and neo-Fisherianism as strategies for escaping liquidity traps. Overall, we find their relative merits depend heavily on the mechanism that initially gave rise to the liquidity trap in question. In particular, policy-makers should distinguish between "shock-based" traps that arise following demand shocks large enough to force nominal rates to their effective lower bound (Eggertsson and Woodford 2003) and "expectation-based'' traps that arise from self-fulfilling shifts in private sector expectations (Benhabib, Schmitt and Uribe 2001). This is because shock-based traps strongly favour forward guidance, while expectation-based traps may favour neo-Fisherianism. With respect to the plausibility of these two trap mechanisms, we further find that the shock-based mechanism likely provides a more plausible explanation for the low inflation witnessed in many developed countries during and after the Great Recession. For this reason, this mechanism deserves more attention in current policy discussions.

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FIGURE 1: Lowering the peg-level parameter $\bar{\iota}$ under a short-lived peg

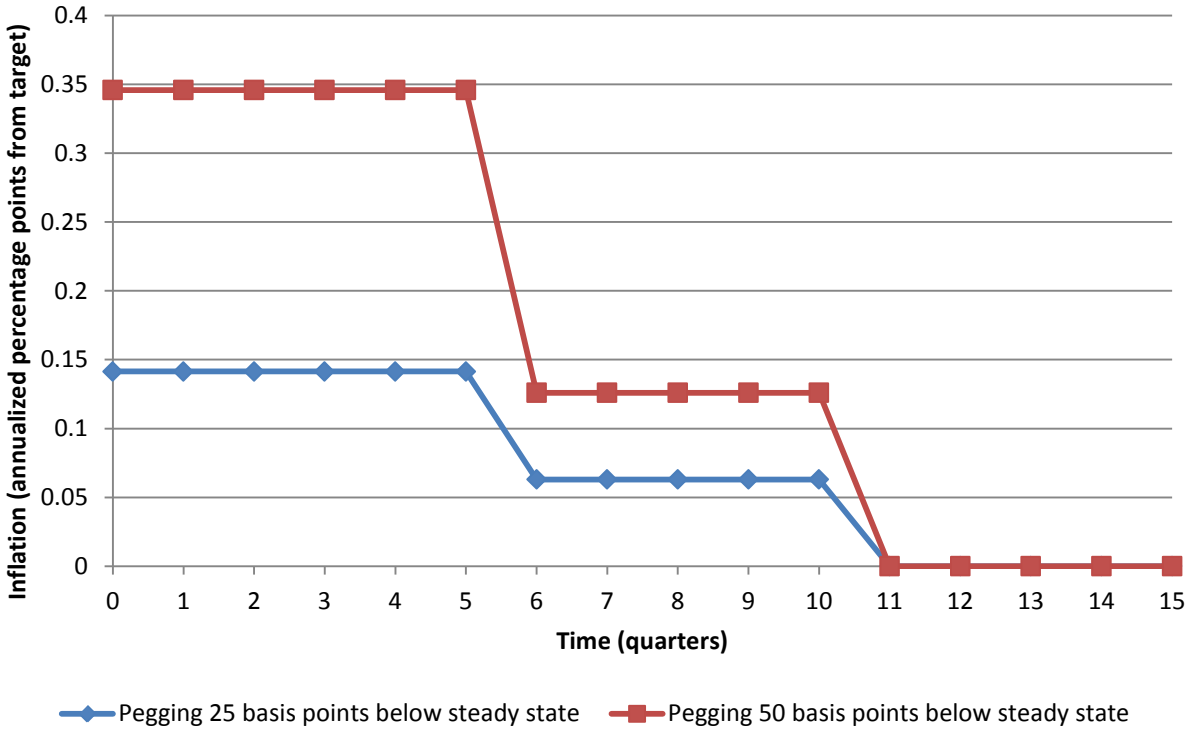


FIGURE 2: Increasing the peg-level parameter $\bar{\iota}$ under a long-lived peg

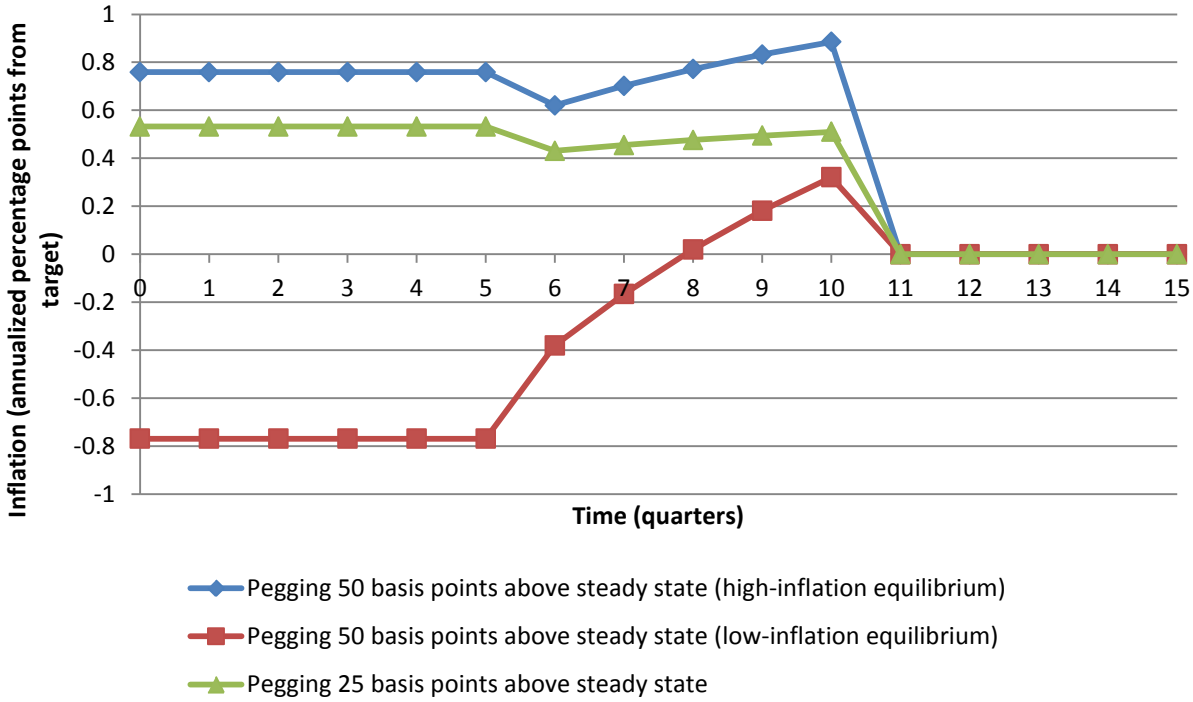


FIGURE 3: Multiple equilibria, as in Benhabib, Schmitt-Grohe and Uribe (2001)

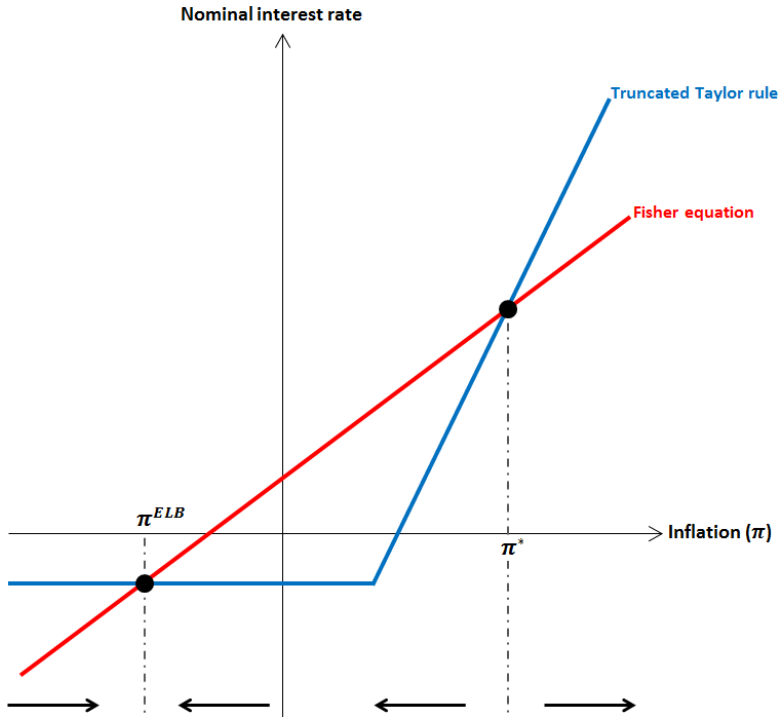
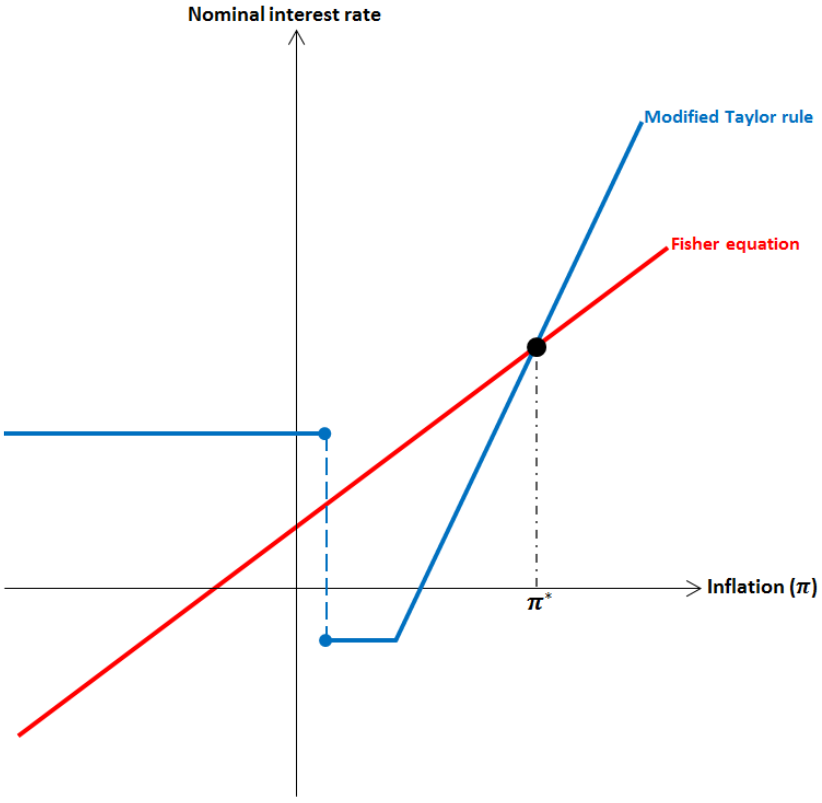


FIGURE 4: Restoring a unique steady state, as in Benhabib, Schmitt-Grohe and Uribe (2001)



Appendix

Dynamics, Uniqueness and the Taylor Principle

This appendix provides a brief discussion of the Taylor principle and its influence on dynamics and equilibrium uniqueness in New Keynesian models. The main ideas can be illustrated in the context of a simple model with flexible prices. When prices are flexible, the real interest rate is independent of monetary policy and takes some value $\boldsymbol{r^*}$ determined by the economy's fundamentals. The Fisher equation thus reads as

$$\boldsymbol{i_t = r^* + E_t \pi_{t+1}}. \tag{2}$$

At the same time, suppose that monetary policy sets nominal rates using a Taylor rule of the form

$$\boldsymbol{i_t = r^* + \pi^* + \phi_\pi(\pi_t - \pi^*)}, \tag{3}$$

where $\boldsymbol{\pi^*}$ denotes the central bank's inflation target, while $\boldsymbol{\phi_\pi}$ measures its responsiveness to off-target inflation. Using these equations to eliminate the nominal rate $\boldsymbol{i_t}$, we find that

$$\boldsymbol{r^* + E_t \pi_{t+1} = r^* + \pi^* + \phi_\pi(\pi_t - \pi^*) \Leftrightarrow E_t \pi_{t+1} - \pi^* = \phi_\pi(\pi_t - \pi^*)}. \tag{4}$$

From this equation, we see that the economy admits a steady-state equilibrium under which $\boldsymbol{\pi_t = E_t \pi_{t+1} = \pi^*}$, i.e., the central bank achieves its target today and is expected to do so tomorrow.

However, this steady state does not represent the economy's only equilibrium. The model also admits high-inflation equilibria under which $\boldsymbol{\pi_t > \pi^*}$. Equation (4) gives us a sense for how inflation must evolve over time under these equilibria and more specifically suggests that these dynamics depend on the responsiveness parameter $\boldsymbol{\phi_\pi}$. Suppose, for example, that $\boldsymbol{\phi_\pi > 1}$, consistent with the Taylor principle. In this case, equation (4) indicates that the model's high-inflation equilibria are associated with expectations of an even greater deviation from target tomorrow, i.e., $\boldsymbol{E_t \pi_{t+1} - \pi^* > \pi_t - \pi^*}$. The intuition for this expectation is relatively straightforward: the central bank has committed to raise the nominal rate quite aggressively should inflation exceed target, but the flexible-price assumption prevents this policy from feeding into real rates, so the Fisher equation balances through an expectation of high inflation tomorrow. If this expectation is subsequently verified, then the same mechanism will give rise to expectations of still higher inflation the day after, and so forth. We can thus conclude that the economy's high-inflation equilibria must exhibit hyperinflationary dynamics. Similar reasoning will verify the existence of low-inflation equilibria satisfying $\boldsymbol{\pi_t < \pi^*}$ and will further show that these equilibria entail accelerating deflation.

What if the Taylor principle fails, i.e., $\boldsymbol{\phi_\pi \in [0, 1)}$? In this case, equation (4) implies that the economy's non-steady-state equilibria are now associated with expectations that deviations from target will dissipate over time, i.e., $\boldsymbol{|E_t \pi_{t+1} - \pi^*| < |\pi_t - \pi^*|}$, where $|\,.\,|$ denotes absolute value. Intuitively, this is because the central bank has now committed not to raise the nominal rate by very much when inflation exceeds target, so the adjustment in inflation expectations needed to balance the Fisher

equation is relatively small. As a result, non-steady-state equilibria now exhibit convergence back to steady state, in contrast with the divergent dynamics described above.

This analysis suggests some strategies that policy-makers can use to eliminate non-steady-state equilibria. Suppose, for example, that the Taylor principle holds and that we wish to eliminate the model's high-inflation equilibria. In this case, Obstfeld and Rogoff (1983) advocate for an "escape clause" under which policy-makers make a commitment to switch to a commodity standard should inflation ever exceed some relatively high threshold. Under a policy of this sort, the anticipation that agents would eventually opt to turn in their money holdings unravels the hyperinflationary expectations supporting high-inflation equilibria. Escape clauses can also be used to unravel the hyperdeflationary expectations supporting low-inflation equilibria under the Taylor principle; these generally involve switching to a money-growth target if inflation falls below some threshold value (Christiano and Rostagno 2001; Atkeson, Chari and Kehoe 2010). As a result, a pair of appropriately specified escape clauses, explicit or otherwise, can generally be used to ensure uniqueness of the steady-state equilibrium whenever the Taylor principle holds.[6] However, this is not possible when monetary policy ignores the Taylor principle, because the convergent dynamics identified in our previous paragraph would then preclude inflation reaching the thresholds at which escape clauses would activate. The model thus remains vulnerable to multiple equilibria whenever the Taylor principle fails.

Although illustrated in the context of a simple flexible-price model, these basic principles generalize to more complicated models with sticky prices, the intuition being that real rates *can* adjust in these settings but have trouble keeping pace with the large changes in nominal rates that the Taylor principle would dictate when inflation is off-target. As a result, New Keynesian models normally have the property that (i) non-steady-state equilibria exhibit divergent dynamics when monetary policy obeys the Taylor principle, so (ii) escape clauses are useful as a strategy for eliminating these equilibria and ensuring uniqueness of the steady-state equilibrium. In contrast, (iii) non-steady-state equilibria exhibit convergent dynamics when the Taylor principle fails, so (iv) escape clauses are ineffective as an equilibrium-selection device and multiplicity remains an important issue.

[6] Interestingly, the Bank of Canada included explicit escape clauses in its early inflation-control target agreements.