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Peter Spahn
University of Hohenheim

Institute of Economics

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Unconventional Views on Inflation Control: Forward Guidance, the Neo-Fisherian Approach, and the Fiscal Theory of the Price Level

*Peter Spahn**

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Abstract
In recent years, various "unconventional" views have been advanced that promise to offer new analytical insights and policy approaches that are suited to control the value of money, particularly in a constellation of low growth and unemployment. Whereas Forward Guidance attempts to decrease the real interest rate by low nominal rates and by creating excessive inflationary expectations, the Neo-Fisherian approach suggests to increase nominal rates immediately to the long-run equilibrium value that corresponds to the inflation target. The Fiscal Theory of the Price Level believes that goods prices jump to a level that validates the long-run sustainability condition of government debt. All three views are criticized for analytical and empirical reasons.

Key words: interest rate policy, zero-lower bound, low-growth equilibrium
JEL Classification: E52, E58

* Institute of Economics (520)
University of Hohenheim
D-70593 Stuttgart
peter.spahn@uni-hohenheim.de

I. Introduction

Old and modern theories of monetary policy, and also the norm of central bank independence, are built on the belief that central banks are able to control inflation. The successful practice of bringing down inflation from double-digit figures since the 1970s justifies this old view, already established by the Quantity Theory of Money – whether central banks use money supply as an active tool or not.

However, monetary policy in some advanced countries seems to have difficulties to raise inflation from a level that does not conform to the conventional 2% target. Many central banks have engaged in what they call "unconventional" policies since the late 2000s. The ECB responded to the malaise by choosing "more of the same", i.e. by enlarging its QE programs. Instruments and supposed channels of transmissions however are hardly different from conventional policies, as described in old textbooks: open-market policies, albeit more aggressive than formerly known, and complemented by "qualitative" features. Modern macro theory had excluded these policies from its suggested toolset because interest setting appeared to be sufficient and more efficient than balance sheet operations.

Some new considerations have also been proposed in recent years which have more direct analytical relations to the modern theoretical apparatus of New Keynesian Macroeconomics (NKM). Economists recommend alternative tools to be applied in order to reach the old and new target of monetary policy: determining the rate of inflation, now in a somewhat unusual direction compared to the former task of stabilisation policy. Included in the list of possible strategies we find Forward Guidance (FG), the New-Fisherian view (NF) and an application of the Fiscal Theory of the Price Level (FTPL); the latter of course might be assigned to fiscal policy in the first place, but the alleged transmission mechanism nicely corresponds to the way of thinking in modern monetary theory so that it will also be treated here. The program of this paper is to discuss whether these new views offer convincing insights. In all three cases the answer will be negative. Finally, it is argued that these unconventional approaches to inflation control are not needed anyway – there is no "puzzle of missing inflation", and central banks should steer their course "back to normal".

II. Forward Guidance and Raising the Inflation Target

Announcing the direction of future interest setting on the part of central banks has been a rather standard element of monetary policies already in the past. This quite easily can be ex-

plained by the forward-looking character of policy making which includes prospects of the future path of target variables, in most cases the rate of inflation, and the corresponding employment of suitable instrument choices. From this point of view, FG may simply be defined as the practice to communicate prospective steps of the central bank decision making process, which however in no way constrains the flexibility to react to new data or insights. "FG rightly does not implicate an unconditioned fixation of the monetary policy course. It is a prediction of this course based on the ECB's Two-Pillar Strategy" (Sachverständigenrat 2017: para. 365, my translation).

But there is also a second interpretation of FG which points to a particular twist of central bank strategy, namely to announce an *overshooting* of inflation in relation to the target for a considerable time period. The reason for resorting to this kind of strategy is the aim to let the economy recover from a deep-seated crisis, so that a particularly low real rate of interest is warranted. The credible announcement of keeping the central bank's policy rate below the Taylor rate that corresponds to the primary inflation target π^*, even when a constellation of macro equilibrium, full employment and $\pi = \pi^*$ is reached, is supposed to push inflationary expectations beyond the target rate.

This type of FG strategy is encumbered with a series of problems. To begin with, it requires some control over long nominal interest rates as well, because otherwise a successful increase of expected inflation might drive up bond rates via the Fisher effect, and the aim of lowering the real interest rate cannot be reached. In this context, the ECB holds the opinion that term premia will be lowered[1], but it is unconvincing to ignore the inflation risk factor. Thus in practice, central banks ought to peg the term structure in order to reap the full benefits of FG.

The literature is more concerned with an alleged time inconsistency problem (Illing 2015). Assume that the policy works and the macro equilibrium with $\pi = \pi^*$ is reached much earlier, thanks to the extraordinary decrease of the real interest rate. In that situation, which

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[1] "The aim of forward guidance may be to introduce greater monetary policy accommodation when the policy rate reaches the interest rate lower bound and cannot be reduced further, by providing assurance that the central bank intends to keep the policy rate low for some time, and for a longer period than the public initially expected. The information provided by the central bank that the policy rate is very unlikely to be raised for some time influences investors' expectations regarding future short-term rates and, through that channel, puts downward pressure on longer-term interest rates. In fact, it contributes to extracting duration risk from the market by reassuring investors that the interest rate risk implicit in holding long-dated fixed-income securities is reduced. This awareness encourages portfolio shifts into longer maturity assets and a compression of long-term yields" (ECB 2014: 67).

conforms to an optimum with regard to the original policy loss function, the central bank clearly has an incentive immediately to stop the low-policy-rate course and return to standard Taylor interest rate setting. Anticipating such a "cheating" behaviour, the public will distrust any announcement pointing to inflation overshooting; thus inflationary expectations will remain in the realm of π^*, the warranted depression of the real interest rate fails and the economy is stuck in stagnation. This type of time inconsistency problem might be particularly severe in a country that is renowned for its stability-oriented monetary policy in the past.

A more fundamental question is whether market agents place too much confidence in policy announcements at all, irrespective of their intentions. This question leads to the core of the FG strategy, and to the FG puzzle which arises from the finding that the communication effect *in theory* is implausibly large, compared to what could perhaps be observed in reality (*Figure 1*). Using the framework of a standard New Keynesian macro model, it can formally be demonstrated that the number of periods in which the central bank policy rate is below its ordinary Taylor level, has a cumulative positive effect on output and inflation. The transmission mechanism is given by rational expectations; this includes the assumption that people are able to use the model and calculate the macro impact of future interest rate policy (Gertler 2017).

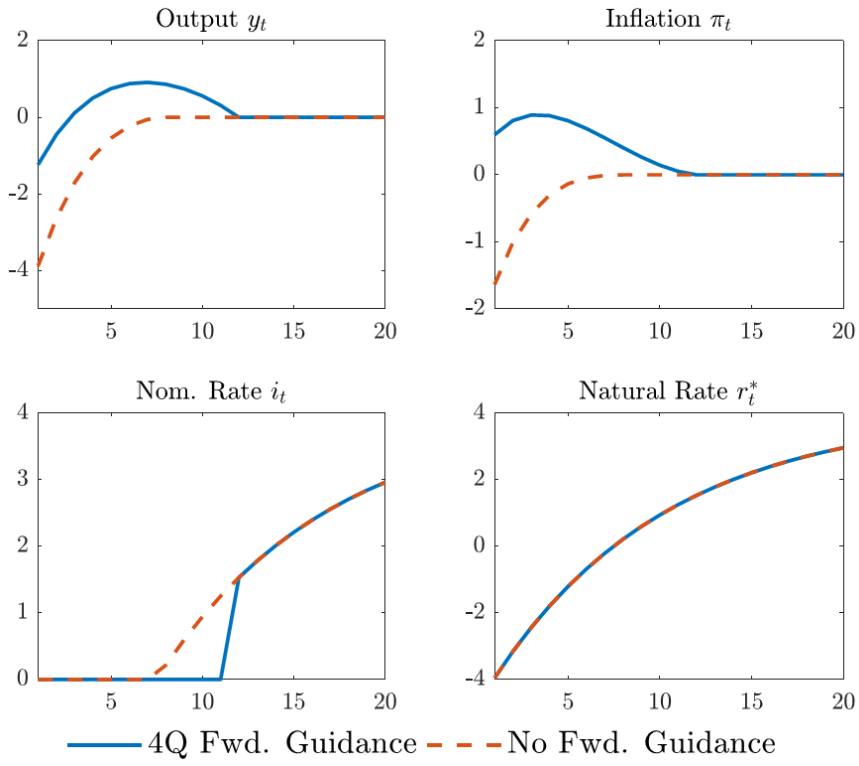

Figure 1: Forward Guidance under rational expectations (Gertler 2017)

It is noteworthy that a comparable effect to FG, in theory, can be realised by changing the inflation target, which also has been suggested recently as a means to strengthen economic recovery and to establish a higher level of nominal interest rates that gives a larger "safety belt" in case of adverse demand shocks (Ball 2014). With FG, the public is supposed to believe in a temporary higher target, whereas the announcement of a new target in general holds until it might be reset in the future. Another difference is that a temporary deviation from the Taylor policy interest rate is highlighted with FG, whereas a reset of the inflation target leaves the implicit path of policy rates in the background. But of course, inflation targets and policy interest rates are connected through the macro model. Therefore they share the same strength and weakness as strategic tools.

The key weakness of FG is the assumption of rational expectations coupled with a generally shared belief that monetary policy is technically able to control the rate of inflation. In fact, it seems awkward in a sticky zero-inflation constellation to propose a 4% target when the central bank obviously and steadfastly fails to reach its traditional 2% target. Gertler (2017: 3) concludes that "individuals need direct evidence that the central bank is capable of moving inflation to target" – but in this case, a macroeconomic control problem that needs to be solved by FG does not exist. In a model with hybrid beliefs, compiled by rational and adaptive expectations where the latter respond to forecast errors, he finds a much weaker effect of FG.

An assessment of FG as a monetary policy strategy aiming to control inflation, on the one hand, should acknowledge the endeavour of central banks to enhance the transparency of their prospective policy course. On the other hand, just communicating intentions will not convince market agents that monetary authorities actually are willing *and able* to achieve a new course of macroeconomic variables. Overshooting inflation expectations, which might serve to confirm a successful FG strategy, cannot be found in the data (*see below*). People rely on experience when building their expectations. It is the crucial drawback of modern macro theory since Lucas that adaptive expectations are regarded as a kind of scientific error that is to be avoided at any costs when it comes to model building. This will become evident also in the next example.

III. The Neo-Fisherian View

III.1. Turning Arbitrage Upside Down: NKM as Bubble Economics

The NF view differs crucially in its policy recommendation from FG: interest rates should not be kept "low for longer" but rather immediately be increased to the level implied by the infla-

tion target. In order to grasp the scientific background of the proposal, it is useful firstly to take a look at a controversy on the dynamic structure of modern macro theory. The standard NK model [1] consists of a supply function, a demand function and an interest rate rule, where E_t is the expectation operator.

$$\begin{aligned} \pi_t &= \beta\, E_t\pi_{t+1} + \alpha\, y_t + \varepsilon_t^s \\ y_t &= E_t y_{t+1} - \sigma\left(i_t - E_t\pi_{t+1} - r^*\right) + \varepsilon_t^d \\ i_t &= r^* + \pi_t + \tau_\pi\left(\pi_t - \pi^*\right) + \tau_y\, y_t \end{aligned} \qquad [1]$$

In a more compact vector-matrix notation this can be written as

$$\mathbf{v}_t = \mathbf{A}\, E_t\mathbf{v}_{t+1} + \mathbf{b}\,\pi^* + \mathbf{C}\,\mathbf{s}_t \qquad [2]$$

where $\mathbf{v}_t$ ($E_t\mathbf{v}_{t+1}$) denotes the vector of (next period's expected) inflation π_t and output gap y_t; $\mathbf{s}_t$ is the vector of white-noise supply and demand shocks, ε_t^s and ε_t^d, respectively. All model parameters (defined as non-negative) are captured by the matrices **A** and **C**, and the vector **b**; α denotes the slope of the supply function, depending on market structure and price setting conventions; σ expresses the intertemporal elasticity of consumption, taken from households' optimisation calculus. The short-term nominal interest rate i_t is set by the central bank; the equilibrium real interest rate r^* drops from the equations. Ignoring shocks, the solution[2] can be calculated as

$$\mathbf{v}_t = \begin{bmatrix} \pi_t \\ y_t \end{bmatrix} = \left(\mathbf{I} - \mathbf{A}\right)^{-1}\mathbf{b}\,\pi^* = \begin{bmatrix} \pi^* \\ 0 \end{bmatrix} \quad \text{if} \quad \beta \to 1 \qquad [3]$$

Dynamic stability requires both eigenvalues of matrix **A** to be smaller than unity. With regard to the reaction coefficients τ_π and τ_y, this implies that the Taylor Principle holds:

$$\tau_\pi + \frac{1-\beta}{\alpha}\,\tau_y > 0 \qquad [4]$$

If the variables of a dynamic system [2] are not pre-determined but depend on expectational leads only, besides the fundamental solution [3], there is formally always a bubble solution showing an explosive path of endogenous variables. Solving [2] for $\mathbf{v}_{t+1} = E_t\mathbf{v}_{t+1} - \mathbf{e}_{t+1}$, where $\mathbf{e}_{t+1}$ indicates expectational errors, and transposing backwards for one period, yields a differ-

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[2] **I** denotes the unity matrix. With the discount factor $\beta < 1$, the solution deviates slightly from the ordinary equilibrium value $y_t = 0$, which is implied by the money neutrality proposition (Woodford 2003: 246).

ential equation, the dynamics of which are determined by past values.

$$\mathbf{v}_t = \mathbf{A}^{-1}\mathbf{v}_{t-1} - \mathbf{A}^{-1}\mathbf{b}\pi^* - \mathbf{e}_t - \mathbf{A}^{-1}\mathbf{C}\mathbf{s}_{t-1} \qquad [5]$$

The value $E_t\mathbf{v}_{t+1}$, built from [5], satisfies equation [2]. The process [5] therefore represents a formal solution of [2]; but it is explosive, contrary to [3]. The eigenvalues of $\mathbf{A}^{-1}$ are not both smaller than unity, just because the Taylor coefficients are positive. From this, Cochrane (2011) concludes that hyperinflation and deflation cannot be excluded in case of Taylor interest rate policies; the emphasis given to the fundamental equilibrium solution [3] is but a convention, warranted for economic policy reasons.

It should be stressed that the foregoing argument represents a minority view in modern macro theory. A key objection is that the system of equations cannot simply be "inverted", so that [5] ensues, because economic causality in NKM states that inflation and output are determined by their expectational leads, but not by an extrapolation of their past values. Equation [5] thus suggest the wrong logic of market behaviour (Woodford 2003: 128). Cochrane (2011: 582) however sticks to a pure mathematical view when he states that "the equations of the model do not specify a causal ordering".[3]

Lending support to Cochrane's view requires the assumption that market expectations follow the process, described in [5], and derive a further increase of inflation from its increase in the past. If however the central bank exerts constraints on output and inflation through higher real interest rates in that case, rational expectations will be anchored on equilibrium values, captured in [3]. Hence, in a scenario of sticky prices, which is the standard assumption in NKM where monetary policy has some control over the real market interest rate, Cochrane's argument should be rejected (McCallum 2009).

Circumstances might be different however if markets are characterised by perfect price flexibility. With the parameter α approaching infinity, output equals its equilibrium level, i.e. $y_t = 0$, and the supply function drops from the NKM system [1]. The consolidation of the demand function (simplified by omitting shocks)

$$0 = -\sigma\left(i_t - E_t\pi_{t+1} - r^*\right) \qquad [6]$$

and the interest rule (where the response to the output gap is ignored)

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[3] Cochrane's reluctance to follow the ordinary understanding of the NKM equation can perhaps be explained by his scientific background as a financial market economist: the formal structure of the NKM model resembles the well known asset valuation equation, which also is purely forward looking, and might switch to bubble paths in case of severe market shocks.

$$i_t = r^* + \pi_t + \tau_\pi \left(\pi_t - \pi^* \right) \qquad [7]$$

yields, after eliminating the nominal interest rate, the relation

$$\pi_t = \frac{1}{1+\tau_\pi} E_t \pi_{t+1} + \frac{\tau_\pi}{1+\tau_\pi} \pi^* \qquad [8]$$

This is a purely forward looking equation, with the fundamental solution

$$\pi_t = \pi^* \qquad [9]$$

which is convergent because of $1/(1+\tau_\pi) < 1$.

But again, as in [5], there is a hypothetical bubble path corresponding to [8] where $\omega_t = E_t \pi_t - \pi_t$ shows the expectation error:

$$\pi_t = \left(1+\tau_\pi\right) \pi_{t-1} - \tau_\pi \, \pi^* - \omega_t \qquad [10]$$

Here inflation is a diverging process on account of $1+\tau_\pi > 1$. For Cochrane, this is a realistic threat. He interprets the modified demand equation [6] as a permanently satisfied condition of Fisher's Nominal Interest Theorem, whereby the market real rate of interest then no longer performs as a macroeconomic control variable.

But this interpretation is questionable. In Fisher's theory, the nominal interest rate is an endogenous variable, determined by the real rate and expected inflation; but in [7] it is fixed by the central bank responding to the inflation gap. Hence, equation [6] can only hold if expected inflation adjusts to the policy interest rate, i.e. $\Delta E_t \pi_{t+1} = \Delta i_t$. This is the core of Cochrane's message (2016: 2): "In a frictionless model, the real interest rate r_t is unrelated to monetary policy and inflation. So, if the Fed sets the nominal rate i_t, expected inflation must follow." Fisher's arbitrage theorem is turned on its head. If this scientific twist is accepted, everything else seems to follow inevitably: as the interest rule prescribes $\Delta i_t = (1+\tau_\pi) \, \Delta \pi_t$, any shock would trigger cumulative inflation driven by Taylor-oriented central bank policies – indeed a paradox result.

Of course, this scientific twist can and should be disputed. At first glance, just like the policy rate i_t, inflation expectation $\Delta E_t \pi_{t+1}$ in [6] is an exogenous term: we cannot force market agents to hold a particular expectation, just in order to keep some model's equation in balance. In formal terms, [6] simply is over-determined and cannot describe any market behaviour. Still it is an open issue how a value for $\Delta E_t \pi_{t+1}$ will be found in the market sphere. If the central bank is unable to control the real interest rate, agents likewise cannot assume that inflation is driven by monetary policy. If persistent shocks are excluded, one might say

that inflation is indeterminate. But this is exactly what lends support to the establishment of the fundamental solution $\pi_t = \pi^*$, as a kind of conventional or sunspot equilibrium.

To summarise, it is surely innovative to describe the NK model as a bubble-prone system, but the scientific practice simply to invert the causal ordering of macroeconomic equations is hardly convincing. Moreover, the assumption necessary to lend at least some integrity to the bubble view, perfect price flexibility, is far beyond any empirical backing. Nevertheless, the preceding discussion serves to give a useful background for a minority approach in monetary policy debates that urges central banks to *raise* policy rates in order to achieve an escape from a low-inflation, low-employment macroeconomic scenario: here, nominal interest rates are regarded as determinants, rather than being determined by, inflation expectations.

III.2. Raising Inflation Through Higher Interest Rates?

Cochrane (2016) and his adherents assume the Fisher Equation to be a stable long-term relationship that has a strong bearing on market agents' beliefs and behaviour. According to that view, a central bank that sticks to a zero-interest-rate policy, aiming to trigger a macroeconomic expansion, unintentionally contributes to the persistence of stagnation; agents are supposed to deduce from low a low policy interest rate via the Fisher Equation that the true inflation target also is low. Choosing a policy rate level according to $i_t = r^* + \pi^*$, on the contrary, would help to anchor inflation expectations at the old target level, i.e. $E_t\pi_{t+1} = \pi^*$, and thus preclude slipping off into deflation.

The latter recommendation of course contradicts the standard wisdom of stabilisation policy where rising interest rates at least in the short run lead to a macroeconomic contraction. Market agents in general will side with this view, although they will also believe that in the long run the Fisher Equation holds. Thus there is a puzzle which might be resolved: do people consider interest rate increases to be of short-run or long-run duration?[4]

In spite of sketchy empirical evidence in favour of this two-sided finding, some crucial issues come up: Do people really think in terms of long-term macroeconomic laws? Do they

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[4] "Nominal interest-rate increases that are expected to be temporary, lead, in accordance with conventional wisdom, to a temporary increase in real rates that is contractionary and deflationary. By contrast, nominal interest-rate increases that are perceived to be permanent cause a temporary decline in real rates with inflation adjusting faster than the nominal interest rate to a higher permanent level. [...] Credible announcement of a gradual return of nominal rates to normal levels can bring about a swift convergence of inflation to its target level without negative consequences for aggregate activity" (Uribe 2017).

believe in the ability of central banks to steer the economy according to their targets, so that market expectations adjust perfectly to communicated changes in the realm of policy aims and tools? Critics regard macroeconomic analyses with perfect-foresight equilibria less useful for practical purposes. Among others, García-Schmidt and Woodford (2015) retreat also from the rational expectations principle which has been an apparently indispensable cornerstone of macro theory since the 1980s. They propose the analytical tool of "temporary reflection equilibria" representing a permanent learning process of market agents. As already mentioned in the debate on FG, this return to an advanced version of the adaptive-expectations view rules out that simply communicating new policy target values or new durations of policy instrument operations will help to overcome a low-inflation stagnation.

A model-based analysis of the NF promise is a difficult task. The macroeconomic constellation of countries that are in need of unconventional stimulus is best to be described as "below equilibrium"; modern macro theories however start their considerations and simulations from equilibrium, as a rule. With that proviso, one might have a look at the consequences of a change of the inflation target in a standard NK model where the implicit assumption is that the economy is in a low-inflation equilibrium at $\pi_t = \pi^*$; the central bank announces a higher rate for a variable length of time. The model simulation explores how the path of the nominal policy interest rate has to be designed.[5]

$$\begin{aligned} \pi_t &= \beta\,(1-\theta)\,E_t\pi_{t+1} + \theta\,\pi_{t-1} + \alpha\,y_t + \varepsilon_t^s \\ y_t &= (1-\theta)\,E_t y_{t+1} + \theta\,y_{t-1} - \sigma\left(i_t - E_t\pi_{t+1} - r^*\right) + \varepsilon_t^d \\ i_t &= r^* + \pi_t + \tau_\pi\left(\pi_t - \pi_t^*\right) + \tau_y\,y_t \end{aligned} \qquad [11]$$

For that purpose, the model presented above is enriched in order to capture the effects of different market structures and market behaviour. A variable dose of persistence $0 < \theta < 1$ has been incorporated in the supply and demand functions, a modification that finds justification in various analytical arguments and empirical findings. The inflation target now follows an AR(1) process

$$\pi_t^* = \varphi\,\pi_{t-1}^* + \delta_t \qquad [12]$$

where δ_t indicates a one-time deviation that persists depending on $\varphi \leq 1$.

The simulation shows the expansionary result of a target innovation δ_t that necessarily

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[5] For similar exercises see Hagedorn (2011), Amano et al. (2016), Gabaix (2016), Gerke/Hauzenberger (2017) and particularly Garín et al. (2016).

forces an adjustment of the nominal interest rate path (*Figure 2*). An arbitrary, middle-of-the-road choice of parameters confirms the traditional finding that a lowering of the rate is required to stimulate the economy – this contradicts the NF view where nominal rates should be raised right from the start. Of course, the results depend on chosen parameters. In accordance with what has been found in the literature, a flat supply curve (low α), a large weight given to output persistence and adaptive expectations (high θ), a weak response to the output gap (low τ_y), and a high probability of returning to the old inflation target (low φ) contribute to counter the NF proposal (*Figure 3*). Conversely, these results support the current practice of central banks to keep interest rates low.[6]

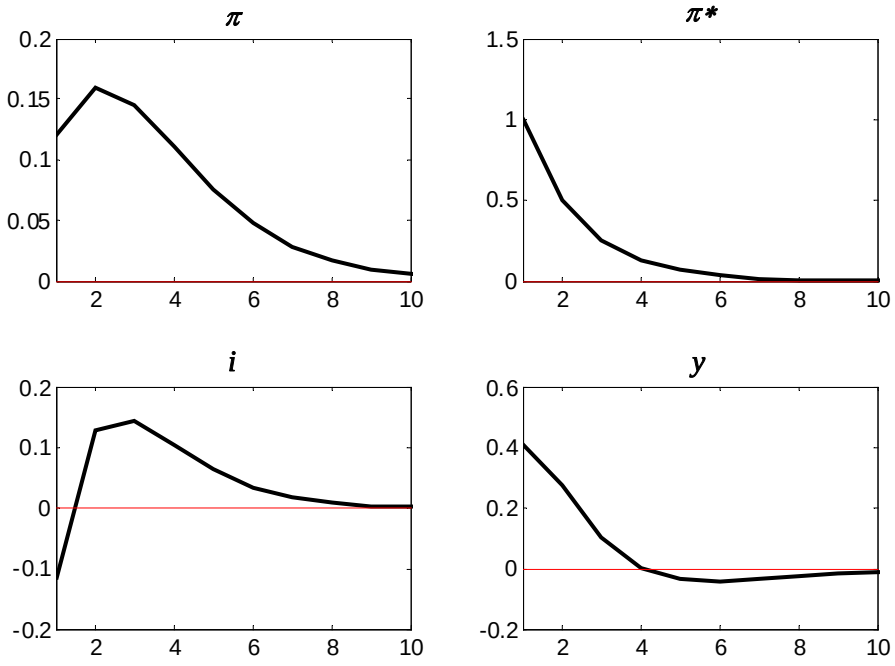

Figure 2: Model simulation (deviations from steady state) after temporary change of inflation target. Parameter values were chosen as $\alpha = 0.1$, $\beta = 0.99$, $\sigma = 1$, $\tau_\pi = \tau_y = \theta = \varphi = 0.5$.

Taking stock, the proposal urging central banks to raise interest rates to a level that conforms to the Fisher Equation and the warranted inflation target $\pi^* > \pi_t$ seems to assume that people build their expectations by looking at long-run equilibrium conditions in economic theory. There is little empirical support for such a view. Even if agents agree that a higher level of inflation will also lead to a corresponding nominal interest rate, they will hesitate to believe that

[6] The probably deleterious consequences of persistent low interest rates for allocative efficiency and dynamic stability of asset markets are beyond the focus of the current paper.

higher interest rates will bring about higher inflation. Again, it is a case of attaching a false causation to an arbitrage relationship.

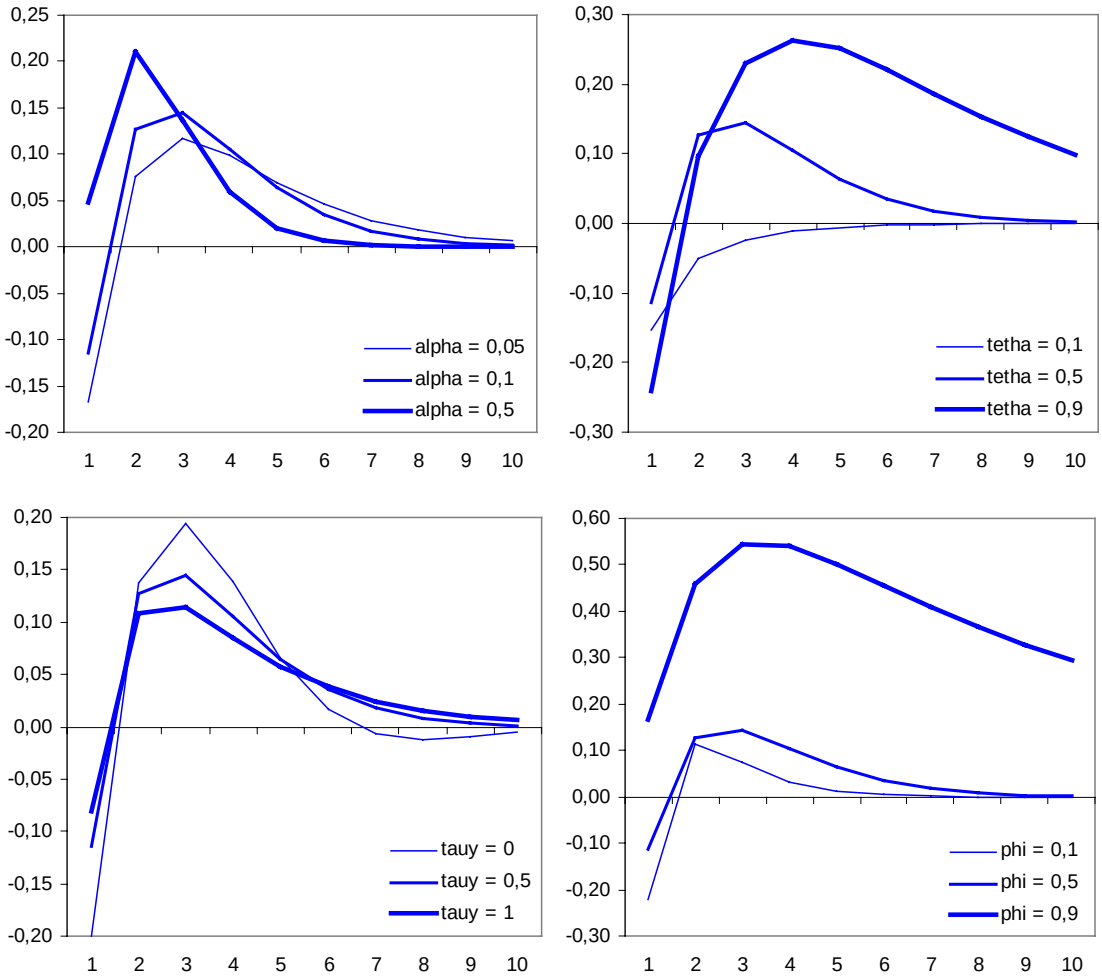

Figure 3: Nominal interest rate path with parameter values different from Figure 2

IV. Misreading Intertemporal Equilibrium Conditions: The Fiscal Theory of the Price Level[7]

At a first glance, FTPL seems to drop from the list of modern views on central bank policies as it apparently deals with fiscal policy. But there are two arguments that might justify its inclusion in the program of this paper. First, economists like Cochrane (2016) who deny that Taylor interest rate policies can determine inflation (*Section III.1*) resort to FTPL when they are asked how to explain the value of money. Second, it will be shown that the FTPL argu-

[7] This Section draws on a chapter in Spahn (2017).

ment implicitly depends on the assumption that some monetary authority pegs the face value of government bonds; therefore the approach has a close link to monetary policy.

Contrary to the Quantity Theory of Money, FTPL derives the level of prices from the state of public finance, i.e. from a condition of intertemporal sustainability of government debt.[8] Here, the real value of nominal current debt B_t should be equal to the discounted sum of all future real budget surpluses X_t.

$$\frac{B_t}{P_t} = \sum_{j=1}^{\infty} \frac{X_{t+j}}{\left(1+r_{t+j}\right)^j} \qquad [13]$$

The equation follows from a standard intertemporal optimisation approach where the transversality condition states that "at the end" of its economic life no agent is allowed to have a net-debtor status. If the time perspective is infinite however, the approach does not stipulate that debts ever are refunded (Blanchard/Fischer 1989: 127); in that case, the long-run sustainability condition is given by positive gap between the real interest rate and the economy's growth rate. FTPL nevertheless holds on to the overly strict condition [13]. Here, analogously to the one-equation approach of the Quantity Theory, the price level P_t is taken as the "final" endogenous variable, which suggests its determination through the other terms of the equation. A fiscal shock that increases the current budget deficit and the nominal stock of debt "requires" higher prices today if the whole future surplus is unchanged.

Is this more than an "accounting gimmickry without substantive interest" (Christiano/ Fitzgerald 2000: 8)? Contrary to the *Unpleasant Monetarist Arithmetic* of Sargent and Wallace (1981), FTPL *at first* does not assume that the central bank increases money supply and prices, aiming to make real public debt sustainable; also there is no expected monetisation. How then do the variables in [13] match? The equation "can be satisfied as long as *P* jumps [!?]. This is what FTPL advocates expect would happen. [...] The market [!?] will generate a value of *P* to guarantee debt is not excessive. [...] The market-clearing mechanism moves the price level, *P*, to restore equality" (Christiano/Fitzgerald 2000: 7, 3).

Taking the price level as a jump variable (beyond an endowment model) contradicts empirical findings and analytical traditions. But the key problem is to give an explanation of price increases. They do not simply reflect fiscal excess demand; rather, the idea seems to be that agents scale up prices because the alternative – an unchecked growth of real public debt

[8] Equation [13] in the literature sometimes is also named the intertemporal budget constraint of government.

– is unconceivable and unwanted. But why should we see private agents repairing the government budget constraint by way of raising prices, thus depreciating their own money wealth, if they do not expect monetary impulses on the part of a central bank? It is hardly comprehensible to regard the price level as a risk-adjusting parameter of bond prices.[9] It is more obvious that market agents try to sell these bonds so that equation [13] is met by a direct depreciation of B_t. "The government's intertemporal budget constraint becomes a pricing kernel for the public debt, determining the effective value of the public debt and overriding its notional or contractual value" (Buiter 2002: 461, cf. Buiter 2017).

On account of this muddle, a tolerable view on FTPL is that it builds implicitly on the assumption of an institutional agent who precludes government bankruptcy (Bassetto 2008). The postulate of a constant nominal value of B_t in FTPL points to the role of the central bank. If nominal bond prices are fixed by monetary policy operations, the prediction of rising prices – in the case where fiscal authorities seem to live beyond their long-term budget constraints – is in line with standard macroeconomic wisdom. The monetarist transmission mechanism between money and prices will apply. Also, observing a mispricing of securities, asset holders will sell government bonds to the central bank and switch to other assets or even goods, which brings about excess demand. Hence, FTPL reduces to the simple recommendation of expansionary fiscal policy while offering a monetary backstop for government debt.

V. Is There a Puzzle of Missing Inflation?

The preceding chapters argued that new "unconventional theories" hardly provide much hope in additional power of central banks. But is this hope necessary after all? Taking into account the deep structural distortions that have come with the US banking crisis and the ensuing euro crisis, it is good news to see inflation on the rise[10] again in major western economies (*Figure 4*). This finding is not quite in accordance with the often-articulated idea of flat supply curves in the world economy, which draw their shape from globalised trade, technical progress and weak wage-setting powers (which in turn depend on labour market deregulation and unemployment on a world scale). These factors surely shaped supply-side conditions in recent

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[9] Also in the euro crisis, we did not witness rising price levels in countries that were hit by severe solvency shocks with respect to their government bonds.

[10] Figures are somewhat more subdued with regard to core inflation. However, the larger the economic area under consideration, the more dubious is the core-inflation concept. Supply-shock events that appear to be exogenous from a small-country point of view turn out to be driven by the overall macroeconomic activity in the world economy.

years, but they do not indicate a fundamental farewell to the principle of scarcity in macroeconomics.

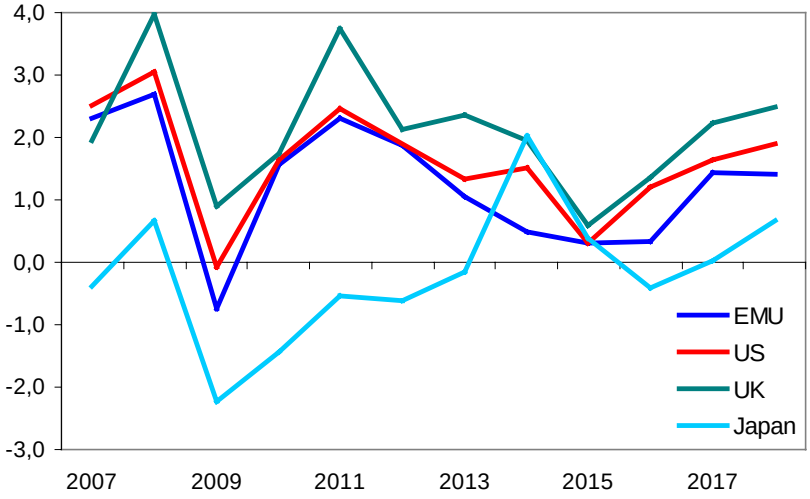

Figure 4: Growth rate of consumption price index
(data source: OECD Economic Outlook, 102, November 2017, online)

The intercept of the goods market supply function is no less important than its slope. It is mainly determined by inflation expectations, which among other factors depend on the central bank inflation target. Aiming at a rough assignment: the *ability* of monetary policy to control inflation determines the movement along the economy's supply function, whereas its intercept depend on the central bank's *credibility* and on market agents' *belief* in its power.[11] There is some evidence of a decline in trend inflation, and inflation persistence seems to have increased.

Analytically, NK models often over-simplify matters by assuming rational expectations whereby trend inflation is identified with the central bank target. The model modification presented in [11] instead allowed for a hybrid mechanism of expectation formation. This setup can be further elaborated by establishing a variable size of agent groups that practice rational and adaptive expectations (the parameter θ was fixed in the model above). It is an obvious idea to let agents choose their preferred mechanism of expectation formation according to their relative performance, i.e. their success to predict key macroeconomic variables. In this case, a protracted deviation from inflation target undermines its credibility, agents will shift to

[11] "Shifts in the mean inflation rate expected in the long run indicate impaired trust in the central bank's commitment to achieve and maintain price stability. [...] By contrast, increased inflation persistence may imply an erosion of the effectiveness of the central bank's policy in stabilising inflation" (Ciccarelli/Osbat 2017: 11).

adaptive expectations, which in turn aggravates the monetary policy task of boosting output and inflation. This poses a risk for the economy to get stuck in a low-inflation constellation (Busetti et al. 2017).

Fortunately, in case of the eurozone, it seems that this risk has not materialised. Inflationary expectations have recovered from their trough in 2015 and are heading now steadily towards a 1.5 % level which is "below, but close to" the ECB target (*Figure 5*). The threat of de-anchoring has vanished (Ciccarelli/Osbat 2017), but there is also no sign of inflation expectations beyond that target rate which would be necessary to lend support to a successful FG strategy. Given this background, the persistent expansionary policy course of the ECB is hard to justify from a macroeconomic point of view. The Federal Reserve seems to be the only central bank, compared to the ECB, the Bank of England and the Bank of Japan, that has begun a normalisation of its policy stance (*Figure 6*).

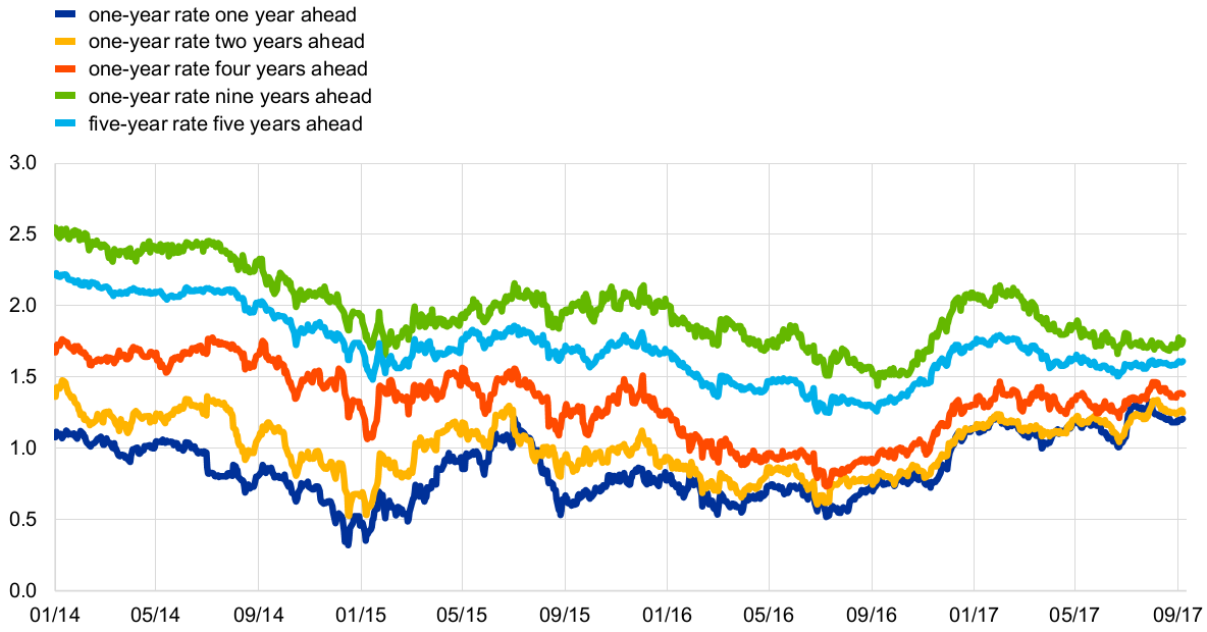

Figure 5: Market-based measures of inflation expectations (ECB Economic Bulletin, 6, 2017: 24)

It is an open secret that the rationale of recent ECB policy is the support for public debt in southern eurozone countries. Keeping up and driving up asset prices also confirms that there is no puzzle of missing inflation in the eurozone. It is no contradiction to the Quantity Theory of Money that goods and asset prices rise in a variable proportion, differing from previous cycles. Creating allocative distortions and dynamic instability on asset markets is too high a price for the attempt to realise some minor increases of goods market inflation.

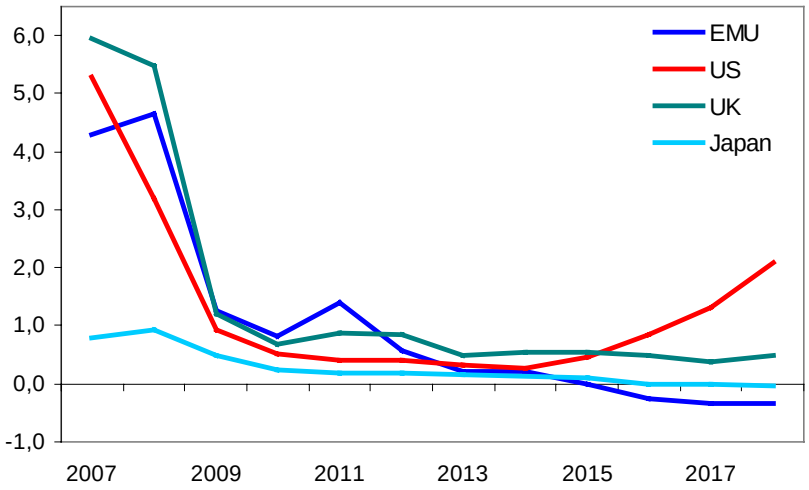

Figure 6: Three-month interbank interest rates
(data source: OECD Economic Outlook, 102, November 2017, online)

VI. Summary

Some "unconventional theories" have been proposed in recent years that aim to shed new light on the ability of monetary policy to control the value of money, beyond the traditional approach of managing interest rates and/or monetary conditions. Three of them that were briefly presented in this contribution were assessed to be less convincing, on analytical as well as on empirical grounds.

FG aims at a modification of standard modern interest rate policy, namely to announce a temporary overshooting of inflation in the near future, relative to the official target, and a sequence of policy interest rates that conform to this goal. In case of a binding zero lower bound, which limits actual central bank actions, FG comprises to keep rates "lower for longer", i.e. the central bank promises not to respond to recovering inflation for some time period. A major objection to FG is: if monetary policy obviously is unable to regain a macroeconomic equilibrium with inflation at the target value by employing its usual means, market agents will hardly believe that the central bank is able to reach an even higher rate.

The NF view turns traditional interest rate policy on its head and calls for higher, not lower rates. If the nominal interest rate immediately is raised to the Fisher Equation level corresponding to the inflation target, market agents – understanding that the economy will soon settle down in a long-term equilibrium – will adjust their inflation expectations, and this will help to bring actual inflation on track. However, one may doubt that individuals think in terms of analytical equilibrium conditions; at most they might have learnt that interest rates are

moved to *counter* any path of inflation. Therefore a NF policy experiment most probably will be counterproductive.

Also the FTPL seems to be on the wrong track. It states that the price level always "jumps" to a value that solves the intertemporal equilibrium condition of public finance, namely that the real value of discounted future budget surpluses "backs" any current budget deficit. The key objection here is that any doubt with respect to the sustainability of government debt will impact on the market price of government bonds, and not (primarily) on the price level of goods.

At first sight, it is difficult to detect a common thread that links all three approaches. They build on assumptions that grow out of a mixture of model-consistent rational expectations – applied in a somewhat simple-minded way –, unfounded trust in policy announcements, and long-term equilibrium conditions, spelled forward and/or backward looking, that markets agents are supposed to believe in. Most probably, macroeconomic relationships between markets and policies work in a more old-fashioned way (Krugman 2018).

The "negative" results, which respect to the persuasiveness of these three approaches, are less relevant from a more practical point of view however. The data do not support the "puzzle of missing inflation". Interest rate policies and Quantitative Easing programs have led to rising prices. The overproportional rise of asset prices should pose a signal for normalisation of monetary policy, in order to avoid allocative distortions and financial instability.

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University of Hohenheim
Dean’s Office of the Faculty of Business, Economics and Social Sciences
Palace Hohenheim 1 B
70593 Stuttgart | Germany
Fon +49 (0)711 459 22488
Fax +49 (0)711 459 22785
wiso@uni-hohenheim.de
wiso.uni-hohenheim.de