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The Critical Role of Conventional Beliefs in Economics: Multiple r*'s and Structural Indeterminacies

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THE CRITICAL ROLE OF CONVENTIONAL BELIEFS IN ECONOMICS: MULTIPLE r^*'S AND STRUCTURAL INDETERMINACIES

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ABSTRACT

This article extends the analytical framework developed in forthcoming *The Critical Role of 'Conventional Beliefs' in Economics* (Bossone, 2026 forthcoming) by applying it to the concept of the natural interest rate, or r^*. It shows that this is not pinned down by preferences and technology, but rather a belief-contingent variable, shaped by prevailing expectations regimes. When agents coordinate around pessimistic views of future demand or policy ineffectiveness, the economy can settle into rational low-growth, low-rate equilibria, and vice versa when their views are optimistic. These belief-driven dynamics generate multiple equilibria, endogenous liquidity traps, and hysteresis, even in the absence of structural frictions. As macroeconomic parameters become belief-sensitive, traditional filtering methods fail to identify r^* reliably across regimes, leading to systematic policy miscalibration. The coexistence of multiple belief-consistent natural rates implies a new form of policy multiplicity: rules coherent within one belief regime may be inconsistent with another. These results challenge the structural interpretation of r^* and call for credibility-sensitive policy frameworks capable of coordinating expectations in belief-dependent environments.
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> "…in any given society there is…a different natural rate of interest for each hypothetical level of employment. And, similarly, for every rate of interest there is a level of employment for which that rate is the "natural" rate, in the sense that the system will be in equilibrium with that rate of interest and that level of employment. Thus it was a mistake to speak of the natural rate of interest or to suggest that the above definition would yield a unique value for the rate of interest irrespective of the level of employment. I had not then understood that, in certain conditions, the system could be in equilibrium with less than full employment. (Keynes, 1936, pp. 242–243)

1. Introduction

This article builds on the analytical framework introduced in Bossone (2026, forthcoming), where it was shown that conventional beliefs—collectively held cognitive models of how the economy works—can fundamentally shape macroeconomic dynamics, even in a frictionless neoclassical setting.[1] That work demonstrated how a shift in prevailing belief systems—from a Walrasian Conventional Belief (WCB) to a Keynesian Conventional Belief (KCB)—can cause identical structural economies to respond differently to the same shock, resulting in divergent outcomes in terms of unemployment, output persistence, and the effectiveness of price adjustments.

Specifically, the earlier work showed that under the WCB, economic agents interpret deviations in prices and quantities as misalignments that prompt self-correcting adjustments. In contrast, under the KCB, the same deviations are read as signals of persistent demand weakness, reinforcing downturns through pessimistic expectations. These divergent belief structures generate multiple equilibrium trajectories—a

[1] Bossone (2026) was initially circulated under the title "The Essential Role of Conventional Beliefs in Economics: Keynesian Unemployment Despite Price Flexibility," as Working Paper 2504 by the *Post-Keynesian Economics Society* in January 2025. After undergoing reviews and revisions, the paper has been accepted for publication in the *Review of Keynesian Economics*. It will appear in the January 2026 issue, under the new title "The Critical Role of 'Conventional Beliefs' in Economics."

feature that challenges conventional rational expectations theory and highlights the role of socially constructed narratives in shaping aggregate behavior.

While the original analysis focused on how beliefs affect employment and shock propagation, this article extends the framework by examining how conventional beliefs also influence the natural (or neutral) interest rate, often referred to in policy discourse as "r^*," and defined as the real short-term interest rate consistent with output at its potential level and inflation at its target, in the absence of transitory shocks and under stable inflation expectations. In particular, the article investigates how the equilibrium interest rate becomes belief-contingent—that is, how the same economy, under different conventional beliefs, can exhibit different steady-state interest rates. This challenges the canonical view of r^* as a structural, belief-independent anchor of monetary policy.

By reinterpreting r^*, this article adds to a growing body of literature questioning the structural invariance of core macroeconomic parameters. It also raises important implications for policy design: if monetary authorities estimate or target an interest rate based on one conventional belief (e.g., the WCB), but the economy operates under another (e.g., the KCB), then even well-intentioned policies may prove destabilizing.

In the remainder of the article, frequent references will be made to the WCB and KCB. The former is to be understood as defining a world where agents believe that the economy is self-adjusting and tends overall to operate under full resource use, with only temporary output and employment fluctuations around their steady states. On the other hand, the KCB is to be understood as a world where the economy may find itself consistently away from full employment, it is not self-adjusting, and agents' expectations (and coordination around them) amplify fluctuations and may lead the economy into multiple equilibria. In most of the arguments presented in this article, the KCB will be linked to general states of economic uncertainty and pessimism. However, it could also be associated with states of optimism and euphoria that influence the "animal spirits" of economic agents. Also, while the discussion in this article will mostly refer to the WCB and KCB, other conventional beliefs can shape agent expectations. See Appendix 1 for a refresher on and other examples of conventional beliefs.

This article is structured as follows. Section 2 reviews the relevant literature across belief-driven equilibria, natural rate estimation, liquidity traps, and hysteresis. Section 3 presents the theoretical model, highlighting how conventional beliefs reshape household and firm behavior and endogenize the natural interest rate. Section 4 explores the policy implications of multiple belief-consistent r^* values, including belief inconsistency, regime stickiness, structural misidentification, and multiple endogenous liquidity traps. Section 5 concludes by discussing the broader implications for macroeconomic theory, policy design, and future research.

2. Related Literature

This article contributes to several intersecting strands of macroeconomic thought by developing a belief-contingent framework in which the natural interest rate r^* is endogenously shaped by prevailing conventional beliefs. The analysis builds on prior research into belief-driven equilibria, estimation challenges for structural parameters, secular stagnation, hysteresis, and policy inconsistency. It extends these literatures by showing that r^* is not a belief-invariant structural anchor, but a belief-sensitive variable subject to multiple equilibria and endogenous regime persistence.

Expectations, Coordination, and Belief-Driven Equilibria

A central premise of this article is that macroeconomic outcomes are not determined solely by fundamentals, but also by the expectations and coordination mechanisms through which agents interpret those fundamentals. Farmer (2012, 2013) challenged the determinacy doctrine embedded in New Keynesian models by introducing a "belief function" whereby self-fulfilling expectations can determine steady-state outcomes. Relatedly, Angeletos and La'O (2013, 2020) developed models of dispersed information and higher-order beliefs, showing how coordination frictions and endogenous signal structures can generate multiple equilibria and persistent fluctuations. Benhabib, Wang, and Wen (2015) emphasized the role of sentiment shocks—belief shifts untethered from fundamentals—as explanatory variables for prolonged macroeconomic deviations, particularly near the zero lower bound.

Building on these insights, the present article formalizes a key extension: the natural interest rate itself is a belief-dependent construct. Whereas much of the literature focuses on output or inflation fluctuations driven by expectations, this article embeds expectations into the structure of intertemporal optimization, revealing how beliefs reshape the parameters that underpin policy rules and estimation models. As a result, belief-coordinated expectations can generate multiple internally coherent values of r^*, inducing structural indeterminacy in both macroeconomic outcomes and policy frameworks.

Belief-Dependent Natural Interest Rates and Estimation Challenges

Traditionally, the natural interest rate is modeled as a function of deep structural parameters—such as intertemporal preferences, productivity, and demographics—and is assumed to be invariant to expectation dynamics. The canonical estimation approach, introduced by Laubach and Williams (2003) and extended by Holston, Laubach, and Williams (2017), treats r^* as a latent variable derived from a semi-structural model, inferred from filtered trends in output and inflation.

However, recent critiques have questioned the identifiability and structural stability of r^*. Hamilton et al. (2016) argued that the estimation of the natural rate is highly sensitive to model assumptions. Rachel and Summers (2019) attributed the secular decline in r^* to long-term trends like demographics and inequality but retained a belief-invariant structural view. In contrast, this article proposes that part of the observed variation in r^* arises from shifts in expectation regimes. In a belief-sensitive economy, conventional filtering techniques are prone to misidentification, as identical observable variables may correspond to different underlying beliefs. This introduces structural indeterminacy into macroeconomic inference, a problem with significant implications for policy design.

Liquidity Traps, Secular Stagnation, and Belief-Driven Dynamics

The article also contributes to the literature on liquidity traps and secular stagnation. Krugman (1998) reintroduced the liquidity trap to explain Japan's prolonged zero interest rate environment, while Eggertsson and Woodford (2003) modeled forward guidance as a solution to temporary negative $r*$ shocks. Eggertsson and Mehrotra (2014) developed an overlapping generations framework in which persistent excess savings push the natural rate permanently below zero. Summers (2014, 2016) reframed these dynamics as symptoms of structural demand shortfalls.

A complementary perspective is offered in Bossone (2025b), which reconsiders the roots of secular stagnation through a belief-centric and liquidity-preference lens. Drawing on the micro-founded utility-based model developed earlier in the volume, the chapter reframes stagnation as a dynamic, expectation-driven outcome rather than the mechanical result of savings-investment imbalances. It emphasizes that persistent pessimism and a heightened preference for liquidity—reminiscent of Keynes's original formulation—can drive economies into low-growth equilibria through their influence on money and asset stock dynamics. This form of "portfolio pessimism," shaped by perceptions of macroeconomic returns and policy credibility, reflects global portfolio behavior under financial openness and can entrench stagnation even in structurally sound economies.

Hysteresis and Endogenous Underutilization

A parallel strand of research examines hysteresis—the notion that temporary downturns can have long-lasting effects on output and employment. Blanchard and Summers (1986) attributed this to labor market frictions and institutional rigidities. More recently, DeLong and Summers (2012) and Fatás and Summers (2018) emphasized how demand shortfalls can erode potential output through reduced investment and human capital accumulation.

This article proposes a complementary mechanism: hysteresis as an endogenous consequence of belief-driven underutilization. Under a pessimistic belief regime (e.g., the Keynesian Conventional Belief), capital accumulation and labor participation decline, and even after expectations shift, the inherited state variables reflect the earlier stagnation path. This form of hysteresis emerges even in a frictionless model, showing that output persistence can be driven entirely by expectations dynamics—a conceptual innovation with implications for the interpretation of output gaps and the reversibility of macroeconomic damage.

Time Inconsistency, Belief Inconsistency, and Institutional Design

Finally, this article contributes to the literature on policy credibility and time inconsistency. Following Kydland and Prescott (1977), Barro and Gordon (1983), and Rogoff (1985), much of the earlier literature focused on the temptation to inflate and the institutional solutions needed to precommit to low-inflation policies. Recent extensions have examined coordination failures under the ELB (e.g., Bernanke et al., 2019) and the interaction between fiscal and monetary regimes (Leeper, 1991; Sims, 2013).

The framework in this article introduces a new source of policy inconsistency: belief inconsistency. That is, a central bank may implement a policy rule optimized for one belief regime (e.g., WCB) while the economy operates under another (e.g., KCB). This leads to systematic policy error and self-defeating dynamics, where the policy stance inadvertently reinforces the prevailing pessimistic belief. The model thus calls for state-contingent, belief-aware policy frameworks and underscores the need for institutional arrangements that support coordinated transitions between belief regimes.

3. BELIEF-DEPENDENT NATURAL INTEREST RATES

In standard neoclassical theory, r^* reflects deep structural parameters—intertemporal preferences, technology, and demographic factors—and serves as the neutral policy rate consistent with full employment and stable inflation. However, if expectations about future output, consumption, and investment are shaped by belief systems—as in the baseline model—then the equilibrium interest rate is no longer structurally fixed.

The model employed to reach this conclusion is the one presented in Bossone (2025a), to which readers are referred for a complete description.[2] In the following, the focus will be exclusively on the key elements of the model that are pertinent to the objectives at hand.

3.1 THE MODEL

The economy consists of a representative household and firm. The households makes consumption, savings, and labor supply decisions to optimizes lifetime utility:

$$(1) \qquad \underset{\{c,s,n\}}{\text{Max}}\ \mathbb{E}_t \left\{\sum_{t=0}^{\infty} \beta^t \left[\log\left(c_t - \psi \frac{n_t^{1+\gamma}}{1+\gamma}\right)\right]\right\},$$

[2] The model structure follows Bossone (2026), featuring a neoclassical economy with representative agents, no frictions or financial markets, and full price and wage flexibility. Agents optimize over intertemporal utility and production under rational expectations. The novelty lies in the introduction of belief regimes that influence how agents interpret observable signals and forecast future states of the world.

where ψ is the disutility of labor parameter and γ is the inverse Frisch elasticity of labor supply,[3] subject to budget constraint

$$(2) \qquad \mathcal{w}_{t+1} = (\mathcal{w}_t + \frac{w_t}{p_t} n_t - c_t + g_t)(1 + r_t),$$

where c is consumption, r is the return on savings, g represents government benefits, tax is taxation, $\mathcal{w}$ is nominal wealth, and p is the output price level, n is labor (and $1 - n$ is the time spent on leisure), $\beta \in (0,1)$ is the discount factor, and expectations $\mathbb{E}[\cdot]$ are based on all available information. The household's real wealth is $\mathcal{w} = k + s$ the sum of the fracton of firms' capital stock K owned by the houshold and savings s. The household plan leads to the Euler equation

$$(3) \qquad 1 = \beta \mathbb{E}_t \left[\frac{c_t - \psi \frac{n_t^{1+\gamma}}{1+\gamma}}{c_{t+1} - \psi \frac{n_{t+1}^{1+\gamma}}{1+\gamma}} \right] (1 + r_{t+1}),$$

The firm determines hiring and investment to maximize expected profits

$$(4) \qquad \underset{\{n,k\}}{\text{Max}}\, \mathbb{E}_t \left[\sum_{t=0}^{\infty} \beta^t \left(y_t - \frac{w_t}{p_t} n_t - r_t k_t \right) (1 + r_t)^t \right],$$

where real output y is produced via a Cobb-Douglas production technology, $y_t = F(k_t, n_t) = A_t k_t^{\alpha} n_t^{1-\alpha}$, with technology A, capital k, and labor n. Capital accumulats as $k_{t+1} = k_t + i_t$, with investment function $i_t = i(y_t, r_t)$, $i_y > 0$, $i_r < 0$ indicating that investment increases with output but decreases as interest rates rise.

Based on Eqs (1)-(4), the household's optimal labor and capital supply are thus:

[3] This functional form ensures the key feature that households increase their labor supply when real income falls for $\gamma > 1$, where γ is the inverse of the Frisch elasticity of labor supply. This parameter measures how labor supply (hours worked) responds to changes in the real wage, holding utility constant (i.e., assuming no changes in wealth or preferences). Assuming $\gamma > 1$ is realistic and largely confirmed by empirical evidence.

(5) $$\mathbb{E}_t\left[\sum_{t=\tau}^{\infty}\frac{U_N(c_{t+\tau},n_{t+\tau})}{U_N(c_t,n_t)}\beta^{\tau}(1+r_{t+\tau})^{\tau}\frac{w_{t+\tau}}{p_{t+\tau}}\right]=\frac{w_t}{p_t},$$

and the equilibrium interest rate is

(6) $$r_{t+\tau}=r_t=\frac{1}{\beta}-1=\varrho$$

where ϱ is the households' rate of time preference, while the firm's labor and capital demand satisfy;

(7) $$\mathbb{E}_t\left[\sum_{t=\tau}^{\infty}\beta^{\tau-t}F_N(k_{t+\tau},n_{t+\tau})(1+r_{t+\tau})^{-(t-\tau)}\right]=\frac{w_t}{p_t}$$

$$\mathbb{E}_t\left[\sum_{t=\tau}^{\infty}\beta^{t-\tau}F_N(k_{t+\tau},n_{t+\tau})(1+r_{t+\tau})^{-(t-\tau)}\right]=r_t$$

In equilibrium, at each date t, the household and firm form expectations of future prices, wages, and interest rates that align with market-clearing conditions:

(8) $$\mathbb{E}_t\left[\frac{w_{t+1}}{p_{t+1}}\right]=F_n(k_t,n_t)$$

(9) $$\mathbb{E}_t[p_{t+1}]=p_t=P_t$$

(10) $$\mathbb{E}_t[r_{t+1}]=r_t=F_k(k_t,n_t)$$

These conditions reflect that agents anticipate price adjustments that will restore full employment after the occurrence of any shock. Equation (10) determines r^*, and solving the model for the household's and firm's optimal plans and aggregating across all households and firms, $\sum_h n=N$ and capital $\sum_f k=K$, leads to equilibrium in the markets for labor and capital, respectively.

It is also useful to remember from the earlier work that dynamics were studied under an assumed recessionary demand shock $\lambda_t<0$ evolving over time as $\lambda_t=\rho\mathcal{S}_t\lambda_{t-1}+\varepsilon_t$, where $1>\rho\geq 0$ is the persistence parameter, $\mathcal{S}$ is the market signaling variable defined below, and $\varepsilon\sim\mathrm{N}(0,\sigma)$ is an innovation term, representing new information available at time *t* affecting the demand-side parameter λ_t.[4] $\mathcal{S}_t$ is a market signal set that includes deviations of prices and quantities from their steady-state values, and $\rho\mathcal{S}_t$ maps these signals into belief-driven persistence effects. The key assumption was that ρ is endogenous to the prevailing conventional belief. Defining $\bar{\rho}$ as structural baseline persistence,[5] and setting adjustment parameter $\theta > 0$, one has that under the WCB agents expect deviations to self-correct, so that $\rho_{WCB} = \bar{\rho} - \theta |\mathcal{S}_t|$, and persistence becomes shorter or even vanishes, while under the KCB agents interpret the same deviations as signals of demand weakness, so that $\rho_{KCB} = \bar{\rho} + \theta |\mathcal{S}_t| > \rho_{WCB}$ and persistence becomes longer.

The model is now used to derive other important results.

3.2 MULTIPLE NATURAL RATES

Assume that the agents expect possible shocks to occur in the future and incorporate such expectations in their optimal plans. Under uncertainty, they ignore the probability distribution governing future innovations, even if one exists, and therefore consider shock λ_t to be driven by an innovation term whose mean value now differs from zero, $\mathbb{E}(\varepsilon_t) = \bar{\varepsilon} \neq 0$. More specifically, assume they anticipate the possibility of adverse macroeconomic developments—such as a recession or persistent stagnation—without relying on a well-defined probability distribution over future shocks. Instead, they internalize a non-zero mean innovation ($\mathbb{E}(\varepsilon_t) = \bar{\varepsilon} < 0$) in their planning, reflecting a pessimistic bias or anticipation of a negative regime shift. This reflects a form of ambiguity-averse behavior, where the fear of persistent bad outcomes shapes expectations and decision-making, even in the absence of concrete information.

[4] Recessionary shock $\lambda < 0$ is such that when it hits output *Y*, post-shock output is $(1 + \lambda)Y < Y$.

[5] Structural baseline persistence is the minimum degree of persistence with which a macroeconomic shock propagates through the economy due to stable institutional, technological, and behavioral frictions. It reflects the inherent sluggishness of the system's adjustment process and serves as a floor below which the temporal effects of shocks cannot fall, regardless of prevailing belief dynamics.

To evaluate the impact of this state of the worlds on the natural interest rate, manipulate the household's Euler equation (3) to solve for r^*, yielding:

$$(11) \qquad r_{t+1} = r_t = r^* = \frac{1}{\beta}\mathbb{E}_t\left[\frac{c_{t+1}-\psi\frac{n_{t+1}^{1+\gamma}}{1+\gamma}}{c_t-\psi\frac{n_t^{1+\gamma}}{1+\gamma}}\right] - 1$$

Taking the consumption utility function used for Eq. (1), and modifying Eq. (11) to incoporate shock expectations, the equation becomes:

$$(12) \qquad c_t = \frac{\theta A e^{\rho S_t^2 \mathbb{E}_t(1+\lambda_{t+1})} k_{t+1}^{\alpha} n_{t+1}^{1-\alpha}}{\beta(1+r_{t+1})}$$

Linearizing Eq. (12) around the steady-state and focusing on the terms involving λ to obtain:

$$(13) \qquad \hat{c}_t = \rho S_t^2 \mathbb{E}_t[\hat{\lambda}_{t+1}] - \hat{r}_{t+1} + other\ terms$$

and taking the expected change in consumption in Eq. (13), give:

$$(14) \qquad \mathbb{E}_t[\hat{c}_{t+1}] - \hat{c}_t = \rho S_t^2\left(\mathbb{E}_t[\hat{\lambda}_{t+2}] - \mathbb{E}_t\left[\hat{\lambda}_{t+1}\right]\right) - \left(\mathbb{E}_t[\hat{r}_{t+2}] - \hat{r}_{t+1}\right) + other\ terms$$

Now, considering $\mathbb{E}_t[\hat{r}_{t+2}] - \hat{r}_{t+1} \approx 0$ under the WCB, where $r^* = r_{WCB}^* = \frac{1}{\beta} - 1 = \varrho$, assuming the "other terms" in Eq. (14) to be constant or negligible (for tractability), and noting that the Euler equation implies that $\mathbb{E}_t[\hat{c}_{t+1}] - \hat{c}_t \approx r_{t+1} - r^*$ (see Appendix 2), Eq. (14) leads to:

$$(15) \qquad r_{t+1} \approx r_{WCB}^* + \rho S_t^2\left(\mathbb{E}_t\left[\hat{\lambda}_{t+2}\right] - \mathbb{E}_t\left[\hat{\lambda}_{t+1}\right]\right)$$

Furthermore, linearizing shock $\hat{\lambda}_t = \mathbb{E}_{t-1}\left[\hat{\lambda}_t\right] + \varepsilon_t$, taking its expected value $\mathbb{E}_t[\hat{\lambda}_t] = \mathbb{E}_t\left[\mathbb{E}_{t-1}\left[\hat{\lambda}_t\right] + \varepsilon_t\right]$,[6] and approximating the change in expectations over time obtain:

[6] Since ε_t is known at time *t* and, therefore, $\mathbb{E}_t[\varepsilon_t] = \varepsilon_t$.

$$\text{(16)} \qquad \mathbb{E}_t[\hat{\lambda}_{t+1}] - \mathbb{E}_{t-1}[\hat{\lambda}_t] = \mathbb{E}_t[\hat{\lambda}_t] - \mathbb{E}_{t-1}[\hat{\lambda}_t] + \mathbb{E}_t[\varepsilon_{t+1}]$$

where, using $\mathbb{E}_t[\hat{\lambda}_t] - \mathbb{E}_{t-1}[\hat{\lambda}_t] = \varepsilon_t$, gives

$$\text{(17)} \qquad \mathbb{E}_t[\hat{\lambda}_{t+1}] - \mathbb{E}_{t-1}[\hat{\lambda}_t] = \mathbb{E}_t[\varepsilon_{t+1}] + \upsilon_t$$

Finally, substituting Eq. (17) into Eq. (16) and considering $\rho \mathcal{S}_t^2 = 0$ under the WCB, one has that:

$$\text{(18)} \qquad \mathbb{E}_t[r_{t+1}] \approx r_{WCB}^* + \rho \mathcal{S}_t^2(\mathbb{E}_t[\varepsilon_{t+1}] + \upsilon_t) = r_{WCB}^*$$

Notice, however, that under non-Walrasian conventional beliefs ("nonWCB") for which $\rho \mathcal{S}_t^2 \neq 0$ holds, agents expect $\mathbb{E}_t(\varepsilon_{t+\tau}) = \bar{\varepsilon} + \nu_t$, for $\tau = 1, \ldots$, where $\bar{\varepsilon} \neq 0$, $\nu_t$is the deviation from the mean, and $\upsilon_t$is the random error. Thus:

$$\text{(19)} \qquad r_{nonWCB}^* \approx r_{WCB}^* + \rho \mathcal{S}_t^2(\bar{\varepsilon} + \nu_t + \upsilon_t) \neq r_{WCB}^*$$

From Eq. (19) follows that, under the KCB, if uncertainty and pessimism cause agents to expect $\mathbb{E}_t(\varepsilon_{t+\tau}) = \bar{\varepsilon} < 0$ for the foreseeable future, a systematic downward drift to shock λ sets in, such that

$$\text{(20)} \qquad r_{KCB}^* = r_{WCB}^* + \rho \mathcal{S}_t^2(\bar{\varepsilon} + \nu_t + \upsilon_t) < r_{WCB}^*$$

that is, the natural interest rate under the KCB falls short of its WCB equivalent, depending on factor $\bar{\varepsilon}$. This difference persists until expectations are not induced to change and despite the shock structure (which accounts for the agents' responses to shocks) is autoregressive (i.e., $\rho \mathcal{S}_t^2 < 1$). Notice that expectations can be such that a falling r_{KCB}^* might hit, or even exceed from below, the effective lower bound set by the (net) return on cash, complicating monetary policy responses.

The result from Eq. (20) reinforces the conclusion that interest rates are influenced by agents' expectations as governed by prevailing conventional beliefs. Specifically, as the equation shows, the natural interest rate under the KCB is subject to two distinct forces:

i. The interaction variable $\rho S_t^2 > 0$, which makes any shock at any time more intense and longer lasting, and

ii. The drift factor $\bar{\varepsilon} \neq 0$, which agents incoporate in their expectations over a foreseable time horizon.

Equation (20) leads to a re-definition of the natural interest rate r^* as ***the belief-contingent real interest rate consistent with the level of output and inflation that agents expect to hold over their relevant time horizon, conditional on the prevailing conventional belief regime*.** The existence of multiple r^* emerges as a concrete possibility inherent in agent decisions driven by expectations rationally formed and based on shared beliefs.

4. Implications of Multiple r*'s

The emergence of multiple belief-contingent natural interest rates $r^{*\prime}s$ marks a profound departure from conventional macroeconomic thought, where r^* is assumed to be unique and act as a structural anchor of monetary policy. In the framework developed here, the natural rate is not a fixed point derived from immutable fundamentals, but a fluid outcome shaped by prevailing conventional beliefs. This recognition transforms how we interpret macroeconomic data, estimate policy benchmarks, and design optimal rules. This section explores the theoretical and policy implications of this multiplicity, with particular emphasis on belief inconsistency, policy error, regime stickiness, structural indeterminacy, and the emergence of multiple endogenous liquidity traps and hysteresis equilibria. The analysis reveals that macroeconomic stability hinges not just on structural parameters or policy calibration, but on the coordination of expectations and the narratives that underpin them.

4.1 BELIEF INCONSISTENCY AND POLICY ERRORS

In standard macroeconomic theory, the natural interest rate r^* is viewed as a structural parameter—an anchor derived from deep fundamentals such as intertemporal preferences, technology, and demographics. Accordingly, monetary policy rules (e.g., Taylor rules or inflation forecast targeting frameworks) are typically formulated to track or converge toward a unique, belief-invariant r^* that ensures full employment and price stability.

However, as shown above, r^* is not structurally invariant. Instead, it is belief-contingent. This belief dependence implies that policy rules built around a fixed natural interest rate, say r^*_{WCB} are inconsistent under a different belief-contingent r^*_{nonWCB}.

Suppose the central bank erroneously assumes a WCB-driven economy when the KCB is prevailing, so that $r^*_{KCB} < r^*_{WCB}$ under pessimism (see Section 3.2). If the central bank adopts a Taylor-type rule

$$i_t = r^*_{WCB} + \phi_\pi(\pi_t - \pi^*) + \phi_y(y_t - y^*)$$

where i is the policy nominal interest rate, π is inflation, y is output, and $\phi_\pi, \phi_y > 0$ are, respectively, the central bank's response coefficients to inflation and output, it follows that its conduct generates systematic *policy error*

$$i_t > r^*_{KCB} + \phi_\pi(\pi_t - \pi^*) + \phi_y(y_t - y^*)$$

which leads to an excessively tight real interest rate. As agents expect recession or stagnation, this policy response reinforces their pessimistic expectations, validating the KCB and further depressing demand.

These dynamics create *belief inconsistency*. Suppose the central bank minimizes the standard quadratic loss function:

$$L = \sum_{t=0}^{\infty} \beta^t \left[(\pi_t - \pi^*)^2 + \lambda(y_t - y^*)^2\right] \tag{21}$$

where $\lambda > 0$ reflects the weight on output stabilization. Under the erroneously assumed WCB, the central bank calibrates its rule around r^*_{WCB}, which is optimal conditional on expectations of fast self-correction but suboptimal otherwise. In fact, if expectations are KCB-driven, the path of $\{i_t\}$ dictated by the WCB-consistent rule no longer minimizes L and results in persistent output gaps and inflation undershooting. The policy turns out to be belief-inconsistent and violates the central bank's own objective function. Worse, the central bank itself may be the catalyst for the belief inconsistency, as the decision to tighten policy based on a higher than optimal r^* in the face of weak demand may trigger or even entrench KCB dynamics. In this sense, policy becomes not just inconsistent, but generative of the very conditions that undermine its assumptions.

This differs from the classical time-inconsistency problem described by Kydland and Prescott (1977), where the temptation to exploit a short-run Phillips curve led to credibility issues. Here, the inconsistency arises not from opportunism but from misplaced structural assumptions in a belief-sensitive world.

Policymakers, therefore, must treat r^* not as a deep parameter but as a belief-sensitive construct. Rules should be state-contingent, adaptable to shifts in prevailing conventional beliefs. Central banks must monitor not just inflation and output, but also narrative and expectation structures that shape economic coordination.

4.2 POLICY MULTIPLICITY AND REGIME STICKINESS

The analysis in the preceding section 4.1 has shown how belief inconsistency generates systematic policy error when a rule calibrated to a well-coordinated belief regime (WCB) is implemented under a prevailing pessimistic belief regime (KCB). However, even when policy is correctly conditioned on prevailing expectations, the structural nature of belief-contingent equilibria gives rise to a deeper challenge: *policy multiplicity***.** That is, the existence of multiple, belief-consistent natural interest rates

r^*'s implies the coexistence of distinct policy rules, each internally optimal within its respective belief-regime $\mathfrak{b} \ni, \{b_j\}_{j=1}^{B}$, where the b_j's are distinct conventional beliefs, but potentially inconsistent across regimes.

Let us again assume that the central bank minimizes the intertemporal loss function represented by Eq. (21), subject to a New Keynesian IS curve and Phillips curve, where the IS curve depends on the real interest rate gap $i_t - \pi_t - r^*_{b_{j_t}}$, and where, consistently with the findings in Section 4.1, the natural interest rate conditional on conventional belief b_{j_t}prevailing at time *t* is given by

$$r^*_{b_{j_t}} = r_{WCB} + \chi(\lambda_t; b_{j_t}) \qquad \text{with } \chi \lesseqgtr 0$$

where χ is a structural coefficient that measures the sensitivity of the natural interest rate to belief-conditioned shock persistence.

Under each belief regime $b_{j_t} \in \mathfrak{b}$, the central bank derives an optimal policy rule $\mathcal{R}_{b_{j_t}}$ that minimizes the loss function conditional on the endogenous dynamics of the regime-specific $r^*_{b_{j_t}}$. In this setup, $\mathcal{R}_{WCB}$and $\mathcal{R}_{WCB}$ are locally optimal but globally incompatible. That is, the calibration of a rule under the WCB—where shocks are smaller and transitory and the natural rate r^*_t is high—cannot be applied under the KCB, where shocks are larger and more persistent and r^*_t is low.[7] This regime-contingent structure implies a *multiplicity of policy equilibria*, each self-consistent within its belief regime but vulnerable to breakdown if belief shifts occur. More formally, define the set of feasible policy rules $\mathcal{P}$ conditional on conventional beliefs $\mathfrak{b}$ as:

$$\mathcal{P}|b_{j_t} = \left\{\mathcal{R}: i_t \ = r^*_{b_{j_t}} + \phi_\pi(\pi_t - \pi^*) + \phi_y(y_t - y^*)\right\}$$

[7] Recall from Section 3.2 that $r^*_{WCB} > r^*_{KCB}$ under uncertainty and pessimism.

Then for each $b_{j_t} \in \mathfrak{b}$, the rule $\mathcal{R}_{b_{j_t}} \in \mathcal{P}_{b_{j_t}}$ is optimal only insofar as expectations remain consistent with b_{j_t}. Should beliefs shift, the optimality of the rule would break down, and the system might enter a new equilibrium path characterized by different expectations, shock persistence, and macroeconomic performance.

The difficulty lies in *regime stickiness*: once expectations coordinate around a pessimistic regime (e.g., KCB), the economy becomes dynamically trapped. The perceived natural rate r_t^* declines, actual real interest rates become tighter even under monetary policy easing, and agents' expectations validate the very conditions that justify the KCB. Transitions between conventional beliefs are not automatic; they require a change in the understanding of how the economy works. In formal terms, the probability of regime switching $\mathbb{P}\left(b_{j_{t+1}} = WCB \middle| b_{j_t} = KCB\right)$ is endogenous to observed macro-outcomes, narrative shifts, and the evolution of agents' knowledge about the economy.

Policymakers face not only the problem of policy calibration within a given expectations regime, but also the more complex challenge of creating conditions under which a credible transition to a superior regime becomes possible. This dual objective—intra-regime stabilization and inter-regime transition facilitation—has no analogue in representative-agent models with fixed structural parameters and unique steady states. In belief-contingent environments, optimal policy design must go beyond minimizing a loss function conditional on a static regime. It must also address the meta-stability of expectations regimes, recognizing that economies may endogenously shift between multiple belief-driven equilibria. Forward guidance, fiscal support, and strategic expectations management are not peripheral tools but essential instruments for escaping low-credibility traps. This regime-dependent logic of policymaking implies that belief multiplicity introduces not only forecasting uncertainty but also structural indeterminacy into conventional empirical estimates of the natural rate of interest r^*, fundamentally altering the informational content of observable macroeconomic variables and challenging standard identification strategies.

4.3 INDETERMINACY IN STRUCTURAL ESTIMATION

A central pillar of modern monetary policy is the estimation of the natural interest rate r^*, which serves as a guide for setting the policy stance. In standard frameworks, r^* is a latent variable inferred from structural models—typically dynamic stochastic general equilibrium (DSGE) models or semi-structural filtering techniques (e.g., the Laubach-Williams model). These methods treat r^* as a fixed function of structural parameters, such as time preference, productivity growth, and capital intensity.

However, once r^* is recognized as being belief-dependent, these estimation strategies become *structurally indeterminate*, and the observed macroeconomic data are no longer sufficient to uniquely identify the true value of r^*, because the data are themselves endogenous to the prevailing conventional belief.

Assume that the KCB holds. In this case, the "true" (belief-contingent) natural interest rate is $r_t^* = r_{KCB}^*$, and the standard observables used in estimating r^*—such as output gap $y_t - y^*$, inflation π_t, and consumption growth Δc_t—are all conditional on the KCB, that is, $y_t = y_{KCB_t}$, $\pi_t = \pi_{KCB_t}$, $\Delta c_t = \Delta c_{KCB_t}$.

Suppose, however, that econometricians or policymakers estimate r_t^* using a standard Euler-based model:

$$\Delta c_t = \varphi\,(r_t - r_t^*) + \eta_t \Longrightarrow r_t^* = r_t - \frac{1}{\varphi}\Delta c_t + residual$$

where φ is the intertemporal elasticity of substitution and $\eta_t \sim N(0, \sigma_\eta)$ is the random error term. This estimation assumes implicitly that the economy operates under WCB-type dynamics—that is, within a belief-invariant framework in which r^*reflects deep structural forces. Under these assumptions, the persistently low values of Δc_t , y_t and π_t, which are in fact outcomes of pessimistic conventional belief KCB, are misinterpreted as evidence of a long-term structural decline in r^*.

As a result, the estimated $\hat{r}_t^*$ numerically coincides with (or is proximate to) the KCB-contingent natural rate, that is, $\hat{r}_t^* \approx r_{KCB}^*$. However, this estimate is structurally misleading, since it is taken as reflecting deep fundamentals, rather than as the outcome of a belief-induced stagnation trap. The policy implication is therefore flawed: the apparent fall in r^* justifies policy passivity, when in fact it requires an active policy stance aimed to change expectations. This would be an issue of regime-contingent misidentification, arising from the structural misspecification of the belief environment.

More generally, conventional beliefs condition the data-generating process and shape the interpretation of structural parameters. It is therefore possible that two distinct belief regimes generate observationally equivalent outcomes. That is, letting $\mathcal{M}_b$ denote the estimation model conditional on a conventional belief, and $\mathcal{D}$ stand for the data set or data path that includes the collection of observable macroeconomic time series that econometricians use to estimate structural parameters, it is possible that:

$$\exists b_1 \neq b_2 \in \mathfrak{b}: \mathcal{M}_{b_1}(\mathcal{D}) = \mathcal{M}_{b_2}(\mathcal{D}), \quad \text{with } b_1 \neq b_2 \tag{22}$$

Equation (22) states that different beliefs can be observationally equivalent, generating similar paths of $\mathcal{D} = \{\Delta c_t , y_t, \pi_t, i_t\}_{t=0}^{T}$. A key implication is that standard filtering techniques (e.g., Kalman-filtered semi-structural models) are prone to structural misidentification, especially in prolonged periods of low inflation and subpar output. If the actual belief regime is the KCB, but estimation assumes the WCB, under pessimism the resulting $\hat{r}^*$ will overshoot the belief-consistent rate, inducing overly tight policy, and vice versa under optimism. Conversely, if the true actual regime is WCB but estimation assumes the

KCB and expects a fall in r^* to follow a recessionary shock, the central bank may prematurely lower policy rates and fuel undue economy overheating later, and vice versa under an expansionary shock.

In either case, belief-contingent r^* introduces a reflexive feedback loop—from beliefs to outcomes, to estimation, to policy, and back to beliefs—that breaks the classical notion of a structurally anchored natural interest rate. This leads to a more radical challenge: if r^* can fall purely as a function of pessimistic conventional beliefs, then the economy may more easily enter a liquidity trap.

4.4 MULTIPLE ENDOGENOUS LIQUIDITY TRAPS

The canonical liquidity trap is a state in which the nominal policy rate reaches the effective lower bound (ELB), rendering conventional monetary policy tools ineffective. Traditionally, such traps are attributed to large adverse demand shocks, deflationary expectations, or secular structural forces—such as demographic trends, rising inequality, a global excess of savings, or heightened financial frictions—that depress the natural rate of interest r^* below the implicit nominal return on physical cash.[8]

However, in the belief-contingent framework developed in this article, a liquidity trap can emerge endogenously—not from deep structural changes, but from shifts in conventional beliefs. In fact, multiple Liquidity traps can arise: the same economy may exhibit several locally stable ELB-bound equilibria, each associated with a different conventional belief and consistent natural interest rate. This section formalizes this result and explores its implications.

Suppose the central bank sets the nominal policy rate according to a Taylor-type rule:

$$i_t = \max\left\{r^*_{b_{j_t}} + \phi_\pi(\pi_t - \pi^*) + \phi_y(y_t - y^*), 0\right\}$$

[8] While the nominal return on cash is zero, the ELB may lie below zero due to storage, insurance, or regulatory costs associated with holding and transacting in physical currency.

with the ELB as a binding constraint. Let b_{j_t} = KCB denote a conventional belief charaterized by uncertainty and by pessimistic expectations about future output, investment, and aggregate demand. As noted earlier, this implies $r^*_{KCB} < r^*_{WCB}$, and potentially $r^*_{KCB} < 0$.

If the prevailing conventional belief drives r^* below zero, and the central bank is constrained by the ELB, then the actual real interest rate $r_t = i_t - \mathbb{E}_t\pi_{t+1}$ becomes too high to support full-employment equilibrium. The economy remains trapped in a low-output, low-inflation equilibrium, with pessimistic beliefs self-confirmed. Crucially, the belief structure makes the trap endogenous. Let the perceived natural rate evolve according to:

$$r^*_t = \bar{r} - \chi\left(y_{b_{j_t}} - y^*\right)$$

where $y_{b_{j_t}} - y^*$ is the belief-dependent output gap, and $\chi > 0$ measures the responsiveness of r^* to pessimism. Remembering agents' different shock responses depending on the prevailing conventional belief (see Section 3 above, and Bossone (2025a) for a more in-depth illustration), this implies that under the WCB, agents expect self-correction; thus, as the output gap $y_{WCB} - y^*$ increases, r^*_t must also rise. In contrast, under the KCB, agents expect a recession; thus, as the output gap $y_{KCB} - y^*$ increases, r^*_t must now decline.

Thus, belief-contingent $r^*_{b_{j_t}}$ becomes nonlinear and discontinuous across belief regimes, potentially creating multiple fixed points where the policy interest rate hits the ELB

$$i_t = 0 = r^*_{b_{j_t}} + \phi_\pi(\pi_t - \pi^*) + \phi_y(y_t - y^*)$$

under different combinations of π and y, given b_j.

Also, and very importantly, the above structure endogenizes the liquidity trap. A trap may arise from a belief-driven collapse in r^*, even in the absence of large shocks. Avoidance requires preemption**:** once pessimistic beliefs take hold, the actual r^*may fall below the ELB before the central bank acts.

In conclusion, whereas in conventional models the liquidity trap is rare, severe, and structurally determined, in belief-contingent frameworks it is endogenous and more likely to happen. The economy may remain at the ELB not because it must, but because agents believe it does and behave in ways that are consistent with it and eventually validate it.

4.5 ENDOGENOUS HYSTERESIS

In standard macroeconomic theory, hysteresis refers to the idea that temporary shocks can have persistent or even permanent effects on output or employment—typically due to structural frictions such as labor market rigidities, skill depreciation, or capital scrapping. These mechanisms treat hysteresis as an exogenous property of the system, operating independently of beliefs.

On the other hand, the framework developed in this article reveals a deeper mechanism: hysteresis can be endogenous to expectations themselves. Specifically, once a pessimistic conventional belief (KCB) prevails, it alters behavior in ways that depress investment, employment, and innovation—even if the initial shock is transitory or the structural fundamentals remain unchanged. As a result, the economy can settle on a permanently lower trajectory, not because of exogenous frictions, but because the belief-induced equilibrium reshapes the path of capital and labor accumulation.

Let aggregate output follow a standard Cobb-Douglas production function $Y_t = A_t K_t^{\alpha} N_t^{1-\alpha}$. In the belief-contingent model, the expected return on capital and the productivity of labor are governed by the beliefs about future demand. Define steady-state output under conventional beliefs as

$$(23) \qquad Y^*|b_j = A\left(\frac{I^*(b_j)}{\delta}\right)^{\alpha}\left[\left(1-\Delta N(b_j)\right)N_0\right]^{1-\alpha}$$

with $\frac{I^*(b_j)}{\delta} = K^*(b_j)$ and $\left(1-\Delta N(b_j)\right)N_0 = N^*(b_j)$, where $I^*(b_j)$ is steady state investment under conventional belief b_j, $\Delta N(b_j)$ is the share of unemployed workers under conventional belief b_j and therefore $1-\Delta N(b_j)$ is effective labor input.

According to Eq. (22), belief-conditioned potential output depends on effective capital and labor as determined over time by the prevailing conventional belief. As a result, beliefs that support optimistic (pessimistic) expectations reverberate positively (negatively) on investment and labor participation and, hence, on output.

Now assume that the KCB has been prevailing for some time in a stagnant economy. Equation (22) says that if, for some reasons, the prevailing conventional belief shifts from the KCB to the WCB, or even from pessimism to optimism still under the KCB, belief-conditioned potential output would adjust accordingly and yet the actual level of output remains below this potential for a while, because the inherited capital and labor stocks are still shaped by the original KCB accumulation path.

Thus, the output gap persists not because of continued shocks, but because of past belief-induced underinvestment and labor unemployment**.** This defines *endogenous hysteresis*: the long-run productive capacity of the economy is shaped by the conventional belief under which it has evolved. Temporary pessimism can leave a permanent mark on real variables.

Unlike structural hysteresis (e.g., Ball 1999), which relies on slow adjustment of wages, skill decay, or structural unemployment, belief-induced hysteresis operates even in a frictionless economy. It arises purely from the intertemporal consequences of coordinated pessimism. This distinguishes it from DSGE models with built-in hysteresis channels (e.g., habit formation, price adjustment costs), in which hysteresis is pre-encoded into preferences or frictions. In the current model, hysteresis is emergent from belief dynamics.

5. CONCLUSION

This article has challenged the canonical view of the natural interest rate as structurally invariant. Drawing on the foundational insight that macroeconomic dynamics are shaped not only by fundamentals but also by prevailing belief systems, the article has shown that the natural rate of interest r^* is fundamentally belief-contingent. When economic agents coordinate around different conventional beliefs—whether Walrasian or Keynesian—the same underlying economy can generate divergent steady states, including multiple values of r^*.

The results can be summarized as follows:

- **Belief-contingent r^*:** The natural interest rate $r^*$is not a fixed structural constant pinned down by preferences and technology, but rather a belief-contingent variable, shaped by prevailing expectations regimes. but varies across expectations regimes, giving rise to multiple belief-consistent r^* values.
- **Multiple equilibria**: Rational expectations equilibria can be belief-selected, allowing for multiple self-confirming macroeconomic paths—including both high-growth and stagnation equilibria—under identical fundamentals.
- **Structural indeterminacy**: Conventional estimation techniques (e.g. Laubach-Williams) fail to identify r^* reliably when beliefs feed back into fundamentals, leading to model-based identification failures.

- **Endogenous liquidity Traps**: Multipe liquidity traps can emerge without large exogenous shocks or structural decline, as pessimistic expectations reduce investment and suppress r^*, making the ELB binding.
- **Belief-induced hysteresis**: Prolonged pessimistic regimes depress capital accumulation and labor force participation, generating endogenous and potentially irreversible output losses.
- **Policy multiplicity and inconsistency**: Different policy rules may be coherent within their respective belief regimes but mutually incompatible across them, leading to dynamic inconsistency when beliefs shift.
- **Expectations management as a policy tool**: Effective policy must combine intra-regime stabilization with credible inter-regime transition strategies, using tools like forward guidance, fiscal coordination, and narrative framing to anchor expectations.

The implications of these findings are far-reaching. Structural estimation strategies that ignore belief regimes risk identifying spurious trends and misguiding policy. Likewise, policy rules optimized under the wrong belief regime become not only ineffective but potentially counterproductive, entrenching the very dynamics they are meant to offset. In such a context, policy inconsistency arises not from time inconsistency, but from belief misalignment.

More broadly, this belief-sensitive framework redefines the nature of macroeconomic indeterminacy. Rather than being the result of technical model multiplicity or parameter uncertainty, indeterminacy here stems from the social coordination of expectations. Accordingly, effective policy requires more than reactive rule-setting; it demands proactive narrative management, institutional credibility, and strategic coordination across monetary and fiscal authorities.

In a world where expectations shape reality, central banks must become not only inflation targeters but belief navigators—attuned to the endogenous feedback loop between policy, beliefs, and macroeconomic outcomes. Recognizing the multiplicity of r^*'s is thus not a technical detail; it is a call to reframe the very foundations of modern macroeconomic policymaking.

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APPENDIX 1. CONVENTIONAL BELIEFS: A REFRESHER

This article defines a “conventional belief” as a shared understanding of how economic processes function and respond to shocks. More precisely, a conventional belief serves as a cognitive framework—explicit or implicit—that structures economic agents' interpretations of market phenomena. This framework is collectively upheld by households, firms, policymakers, and other economic actors, guiding their assessments of economic signals such as prices, wages, exchange rates, and output levels. It also shapes how they gather information, formulate expectations, and make strategic decisions.

Importantly, an individual agent does not need to believe that a conventional belief is fundamentally "true" in an absolute sense. It suffices for the agent to perceive that a given belief is widely held within the relevant economic community for it to influence decision-making.

The nature of conventional beliefs is not necessarily grounded in objective or immutable economic laws. Instead, they emerge as a socially constructed consensus, evolving over time based on historical, cultural, and institutional factors. Conventional beliefs feature several defining characteristics. First, they are not imposed externally; rather, they evolve based on past economic performance, policy decisions, and institutional developments. Second, these beliefs shape agent behavior in ways that validate them. For example, if economic agents interpret falling prices as a sign of declining demand, their subsequent actions – such as reducing investment or delaying purchases—reinforce that expectation, making the downturn self-fulfilling. Third, conventional beliefs function as an expectations equilibrium: they influence not only individual expectations about economic variables but also perceptions of how others in the economy will behave. Finally, the prevailing conventional belief determines how agents interpret economic signals – whether they view price changes as temporary fluctuations, structural shifts, or indicators of deeper economic problems.

Within a formal economic model, conventional beliefs serve as *meta-assumptions* that guide how agents interpret constraints, parameters, and equilibrium conditions. Specifically, they influence:

- **Expectations formation**: Agents’ expectations regarding future wages, prices, and interest rates depend on the prevailing belief system.
- **Behavioral rules**: Decision-making in areas such as labor supply, investment, and consumption is shaped by how agents interpret market signals through their belief framework.
- **Adjustment mechanisms**: The responses of wages, prices, and quantities to economic shocks depend on the dominant conventional belief.

Thus, conventional beliefs function as an essential interpretative lens that connects individual expectations, decision-making, and macroeconomic dynamics, playing a pivotal role in shaping the outcomes of economic models and policies.

While the discussion in the article has mostly referred to the WCB and KCB, other conventional beliefs can shape agent expectations, as reported in Table A.1.

Table A.1 Conventional Beliefs in Macroeconomics

Conventional Belief	Core Assumption	Belief-Driven Agent Reactions
Walrasian	Markets clear via price flexibility; full employment is the norm.	Expect quick adjustment; low liquidity demand; minimal precautionary saving; policy seen as distortionary.
Keynesian	Demand determines output; prices are sticky.	Increase liquidity preference; reduce investment and hiring; expect and support active stabilization policy.
Ricardian	Debt implies future taxes; fiscal policy is neutral.	Save in anticipation of taxation; fiscal expansion offset by private dissaving.
Quantity Theory	Money growth drives inflation; velocity is stable.	Anticipate inflation from monetary expansion; adjust nominal prices and reduce money demand.
Rational Expectations	Agents form expectations using the correct model.	Neutralize anticipated policy; base decisions on model-consistent forecasts; resist persistent surprises.
Secular Stagnation	r* is structurally low due to demographics, inequality, etc.	Shift portfolios toward safe assets; lower consumption and investment; expect persistent slack.
Fiscal Dominance	Fiscal stance determines price level; monetary policy accommodates.	Monitor debt sustainability; anticipate inflation from fiscal imbalances; demand higher yields.
Financial Frictions	Credit constraints and risk premia dominate dynamics.	Respond to changes in spreads or collateral; hoard liquidity in downturns; weak sensitivity to interest rates.
New Classical	Business cycles reflect optimal responses to real shocks.	Accept output fluctuations; disregard policy stabilization; form expectations independently of interventions.
Modern Monetary Theory	Sovereign issuers face no financial constraint; inflation is the limit.	Deem fiscal expansions sustainable; ignore debt levels unless inflation rises; expect persistent deficits.
Austerity	Fiscal discipline restores confidence and growth.	Cut spending in downturns; anticipate delayed gains; reduce private demand in line with consolidation.
Global Liquidity	International financial conditions dominate domestic ones.	Align portfolios with global signals; expect weak traction of local policy; shift to reserve assets in risk-off episodes.
Fiscal Theory of the Price Level	The price level adjusts to satisfy the government's intertemporal budget constraint, given fiscal plans and nominal debt.	Agents monitor fiscal trajectories to infer inflation trends; expect monetary policy to passively support fiscal solvency; bond markets react to primary balance forecasts rather than central bank signals.

These belief regimes help explain how identical structural economies may exhibit distinct equilibria depending on the dominant narrative. Expectations coordination around such beliefs can endogenously determine the natural interest rate, inflation dynamics, and the effectiveness of policy interventions. The coexistence of multiple self-consistent belief regimes underlines the central thesis of this article: that macroeconomic dynamics and policy effectiveness are deeply shaped by collective cognitive frames.

APPENDIX 2. DERIVATION OF THE APPROXIMATION $\mathbb{E}_t[\hat{c}_{t+1}] - \hat{c}_t \approx r_{t+1} - r^*$

Let us start from Eq. (17), in the text, for the interest rate in the text and let us report it here for convenience:

$$r_{t+1} = r_t = r^* = \frac{1}{\beta}\mathbb{E}_t\left[\frac{c_{t+1} - \psi\frac{n_{t+1}^{1+\gamma}}{1+\gamma}}{c_t - \psi\frac{n_t^{1+\gamma}}{1+\gamma}}\right] - 1$$

Define the log deviation of a variable *x* around the steady state as:

$$\hat{x}_t = \frac{x_t - x^*}{x^*}$$

and assume (for simplicity) that $\hat{n}_t = 0$.

Approximating the fraction inside expectations:

$$\frac{c_{t+1} - \psi\frac{n_{t+1}^{1+\gamma}}{1+\gamma}}{c_t - \psi\frac{n_t^{1+\gamma}}{1+\gamma}} \approx 1 + \frac{c^*}{C^*}(\hat{c}_{t+1} - \hat{c}_t)$$

where $C^* = c^* - \psi\frac{(n^*)^{1+\gamma}}{1+\gamma}$

Taking expectations:

$$\mathbb{E}_t\left[\frac{c_{t+1} - \psi\frac{n_{t+1}^{1+\gamma}}{1+\gamma}}{c_t - \psi\frac{n_t^{1+\gamma}}{1+\gamma}}\right] \approx 1 + \frac{c^*}{C^*}\mathbb{E}_t[\hat{c}_{t+1} - \hat{c}_t]$$

Log-linearizing r_{t+1} yields:

$$r_{t+1} \approx \frac{1}{\beta}\left(1 + \frac{c^*}{C^*}\mathbb{E}_t[\hat{c}_{t+1} - \hat{c}_t]\right) - 1$$

$$\approx \frac{1}{\beta} + \frac{c^*}{\beta C^*}\mathbb{E}_t[\hat{c}_{t+1} - \hat{c}_t] - 1$$

Since the steady-state interest rate satisfies

$$r^* = \frac{1}{\beta} - 1$$

the log-linearized equation

$$\hat{r}_{t+1} \approx \frac{c^*}{C^*} \mathbb{E}_t[\hat{c}_{t+1} - \hat{c}_t]$$

Since $D^* \approx c^*$when labor disutility is small,

$$\hat{r}_{t+1} = r_{t+1} - r^* \approx \mathbb{E}_t[\hat{c}_{t+1} - \hat{c}_t] = \mathbb{E}_t[\hat{c}_{t+1}] - \hat{c}_t$$

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