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Generalised Conflict Inflation: Rigidities, Indexation, and their Endogeneity on the Path to Hyperinflation

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Abstract
This paper advances post-Keynesian conflict inflation theory in four main ways. First, it resolves a longstanding ambiguity surrounding the speed-of-adjustment parameters in conflict inflation models. It is argued that these parameters reflect the costs of adjusting wages and prices, and the existence of staggered contracts. Second, drawing on this reinterpretation, we show how indexation can be formally incorporated into the Generalised Conflict Inflation Model (Woodgate, 2026), meaning that both inflation expectations *and* indexation explicitly feature in the same model—a novelty among conflict inflation models. Third, adopting a stochastic staggered contracts interpretation, we show this extension implies *distributions* of real wages among cohorts of workers and firms in equilibrium, with dispersion widening at higher rates of steady-state inflation. Fourth, we argue that rather than simply suffering this erosion of real income, workers and firms raise the degree of indexation and reset frequency over the long run as trend inflation rises, and show that the resulting shorter effective contract durations, while protecting real incomes, lower the degree of distributional conflict required to trigger hyperinflation.

Keywords: Inflation, distribution, rigidities, stability, hyperinflation

JEL: D33, E31, E12

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1. Introduction

There has been great progress in the theory of conflict inflation in the roughly 50 years since the seminal model of Rowthorn (1977)—as documented in the recent survey by Hein (2025), for example—yet some significant issues remain outstanding. This paper is motivated by three of these issues in particular. The first issue concerns the precise theoretical meaning of the wage and price speed-of-adjustment parameters, also known in the literature as the aspiration gap coefficients. Throughout the conflict inflation literature, these parameters are said rather vaguely and without consensus to be determined by bargaining power (e.g. Lavoie 2022, ch. 8) and/or conventions and regulations related to wage- and price-setting and institutions (e.g. Blecker and Setterfield 2019, ch. 5; Hein 2023, ch. 5). This ambiguity not only weakens such conflict inflation theories, it also makes them difficult to operationalise empirically as these parameters represent another unobservable in addition to the real wage targets (if not further parameters). A second conspicuous shortcoming that can be observed across conflict inflation models is that they tend to explicitly feature either inflation expectations (e.g. Hein 2023, ch. 5) or indexation (e.g. Lavoie 2022, ch. 8; Blecker and Setterfield 2019, ch. 5), but rarely if ever both. It is far from obvious why these two mechanisms should be treated as mutually exclusive, given that inflation expectations and indexation clauses frequently coexist and interact in real-world wage- and price-bargaining processes. The third and final issue that motivates this work is that the aforementioned speed-of-adjustment parameters and degrees of indexation are treated as exogenous constants throughout the conflict inflation literature. This ignores a crucial empirical reality, wherein workers and firms do not passively adhere to fixed adjustment schedules under conditions of high or accelerating inflation (Alvarez et al. 2019, Gödl and Gödl-Hanisch 2024). Instead, the lived experience of inflation induces endogenous institutional adaptations, such as more frequent contract renegotiations or a higher degree of indexation.

This paper directly addresses these three issues by extending the “Generalised Conflict Inflation Model” (Woodgate 2026), better specifying the foundations of its adjustment parameters and integrating indexation more formally. To clarify what the speed-of-adjustment parameters represent and how they are determined, we draw upon related theories of nominal rigidities from New Keynesian macroeconomics to see if they can shed some light on this matter without violating post-Keynesian principles. These theories are those of adjustment costs à la Rotemberg (1982) as well as deterministic (Taylor 1979) and stochastic (Calvo 1983) staggered contracts. We find that there are aspects of these theories that can better specify what the speed-of-adjustment parameters in post-Keynesian conflict inflation models mean, without also imposing assumptions that are incompatible with post-Keynesian thinking, such as rational and optimising agents. We argue that the *adjustment costs* view is particularly helpful in conflict inflation models with perfectly homogeneous groups of workers and firms, whereas the *staggered contracts* view allows one to construct conflict inflation models with heterogeneous cohorts of workers and firms that differ in terms of when they reset their wages and prices respectively.

By adopting a stochastic staggered contracts approach with indexation and inflation expectations, we show that speed-of-adjustment parameters correspond directly to wage and price reset frequencies, which combine with the degrees of indexation to define the *effective duration of wage and price contracts*—essentially the number of periods for which any given wage or price exists. The staggered contracts approach implies *distributions* of worker-cohorts and firm-cohorts. Rather than all workers and firms settling for exactly the same real wage in equilibrium as per traditional conflict inflation models, we show that now the equilibrium real wage must be understood as the weighted arithmetic mean of the various workers' real wages and the weighted harmonic mean of different firms' real wages. Importantly, we show that the dispersion of real wages among workers and firms in equilibrium widens with higher rates of steady-state inflation. This means that some unfortunate cohorts can fall far below the mean of their distribution since they are stuck in outdated wage or price contracts whose effective duration is too long (i.e. reset frequencies and indexation are too low) given this higher rate of inflation. Assuming then that reset frequencies and indexation rise to protect against excessive real income erosion in equilibrium, the model thus explains our empirical reality in which wage and price durations fall when trend inflation rises.

With this in mind, this paper endogenises effective contract durations as a function of long-run inflation as a last step. We argue that while effective contract durations shorten to protect against real-income erosion, relative bargaining power, which is reflected in the ratio of the effective duration of prices relative to wages, must remain structurally fixed. A key corollary of this endogenous adaptation is that as trend inflation rises, the threshold for hyperinflation shrinks: Institutional defences like higher indexation and higher reset frequencies protect against excessive real income erosion, but they also make the system increasingly fragile, lowering the degree of conflict required to trigger hyperinflation.

The remainder of this paper is organized as follows. Section 2 unpacks the interpretations of adjustment speeds under assumptions of homogeneity (convex adjustment costs) and heterogeneity (staggered contracts). Section 3 incorporates indexation into the stochastic staggered contract framework, establishes the equilibrium properties of real wage distributions, and provides Taylor-series approximations for equilibrium real wages and inflation, improving upon those seen in Woodgate (2026). Section 4 examines the dispersion of real wages across cohorts and endogenises effective durations of wages and prices to determine the tipping points at which hyperinflation sets in. Section 5 concludes with policy implications and directions for future work.

2. Rigidities and Indexation in the Generalised Conflict Inflation Model

The root of the difference between the Generalised Conflict Inflation Model found in Woodgate (2026) and the vast majority of previous conflict inflation models lies in the foundations of wage- and price-setting. In Woodgate (2026), the wage and price levels (w and p) in any given period *t* are assumed to follow a partial adjustment process, determined by the speed of adjustment of wages and prices (λ_w and λ_p) and workers' and firms' *nominal* wage and price targets (w_t^* and p_t^*), such that

$$w_t = w_{t-1} + \lambda_w(w_t^* - w_{t-1}), \tag{1}$$

$$p_t = p_{t-1} + \lambda_p(p_t^* - p_{t-1}). \tag{2}$$

Nominal wage and price targets are based on the real wage targets (τ_W and τ_F) as usual, but must also depend upon expectations of the price and wage level (w_t^e and p_t^e), and thus the expected rate of price and wage inflation, $\hat{w}_t^e$ and $\hat{p}_t^e$, yielding

$$w_t^* = \tau_W p_t^e = \tau_W p_{t-1}(1 + \hat{p}_t^e), \tag{3}$$

$$p_t^* = w_t^e/\tau_F = w_{t-1}(1 + \hat{w}_t^e)/\tau_F. \tag{4}$$

Using this system of four equations and solving for when inflation and distribution is stable (i.e. when $\hat{w}_t = \hat{p}_t = \hat{w}_{t-1} = p_{t-1}$), yields the nonlinear and asymptotic stable-inflation curves that distinguish the model in Woodgate (2026) from other conflict inflation models, and the main result that inflation is only stable if the difference between the real wage targets is not too large.

The departure point in this paper follows from closer scrutiny around the meaning of the speed of adjustment of wages and prices. In Woodgate (2026), all that is said about these parameters is that both must be bounded such that $0 < \lambda_w, \lambda_p < 1$ and are "taken to be determined by conventions around wage and price setting, and the usual institutional forces" (p. 3). This is rather vague, and yet the same critique could also be applied to the discussions of similar adjustment/rigidity parameters in previous conflict inflation models.

By better specifying what these speed of adjustment parameters mean, we aim to show that one can better motivate a theory of how they are determined and how indexation relates. To do so, it is useful to review how the related rigidity parameters in the New Keynesian literature are treated and assess the extent to which such concepts and treatments are compatible with post-Keynesian principles—particularly those of satisficing (rather than optimising) behaviour and bounded (rather than perfect) rationality. We will approach this task first maintaining the usual assumption that workers and firms are each perfectly homogeneous groups, where Rotemberg (1982) is the key reference. Then we will suppose that workers and firms are still homogeneous in terms of having the same real wage targets, but heterogeneous in the sense that they cannot all reset their wages and prices whenever they wish due to the existence of staggered contracts à la Taylor (1979) and Calvo (1983).

2.1 Homogeneous workers and firms: The cost of conflict

If workers and firms are two homogeneous groups, then supposing that $0 < \lambda_W, \lambda_F < 1$ is rather odd since it implies that workers and firms move towards their respective targets but never quite achieve them in finite time. A similar point is made by Serrano et al. (2024, p. 1520). Yet if $\lambda_W = \lambda_F = 1$, then wages and prices, being perfectly flexible, are always at their nominal targets, and there is no sustained nonzero rate of wage or price inflation that can arise out of Equations (1) and (2) at all.

To resolve this analytical strangeness while holding onto the simplifying assumption of homogeneous workers and firms, one must explain why the adjustment towards nominal targets is partial rather than full. To do so, we can rely on a version of the mechanism found in Rotemberg (1982), which we simplify here and extend to wages rather than just prices. The original approach invokes optimising behaviour, as we shall see, so we shall return to the question of compatibility with post-Keynesian principles thereafter.

The central idea is that changing prices and wages is costly. For firms, there exist explicit administrative costs associated with managerial time dedicated to deliberation over what new price to set and the communication of the new price, but there is also "the implicit cost that results from the unfavourable reaction of customers to large price changes" from which it follows that "customers may well prefer small and recurrent price changes to occasional large ones" (Rotemberg 1982, p.522). Even if a firm's market dominance may allow for a higher markup, if its prices rise by too much too quickly, it may undermine customers' trust and brand allegiance, triggering backlash from consumers if not regulators. A similar argument applies for workers. As stated in Woodgate (2026, p. 3), "engaging in negotiation is inherently costly in terms of time and effort, and may come at the risk of worsening workplace or industrial relations". Moreover, in a world of fundamental uncertainty, gauging what size of price or wage increase will be tolerated is no easy feat.

With this in mind, we can thus represent the adjustment cost of prices as ϕ_p and of wages as ϕ_w and assume the costs are a constant proportion of the squared change in prices and wages respectively. These adjustment costs are convex because large nominal increases are far less likely to be tolerated than small changes for the reasons just laid out. We can define loss functions for workers (L_t^W) and firms (L_t^F) as follows

$$L_t^W = (w_t - w_t^*)^2 + \phi_w[w_t - w_{t-1}]^2, \tag{5}$$

$$L_t^F = (p_t - p_t^*)^2 + \phi_p[p_t - p_{t-1}]^2, \tag{6}$$

where not being at one's target is painful (the first term in each loss function) but so too is changing wages and prices (the second term).[1] Assuming workers and firms minimise their loss, we can derive

[1] In fact, each term should be normalised by the lagged wage and price to make the loss functions scale invariant, but this does not affect the derivation of the λ parameters that we are interested in here anyway.

Equations 1 and 2 from this setup, where it follows that the λ parameters are inversely related to the adjustment costs, as shown in Equations (7) and (8).

$$w_t = \left(\frac{1}{1+\phi_w}\right) w_t^* + \left(\frac{\phi_w}{1+\phi_w}\right) w_{t-1} \;=\; w_{t-1} + \lambda_w (w_t^* - w_{t-1}) \quad \rightarrow \quad \lambda_w = \frac{1}{1+\phi_w}, \tag{7}$$

$$p_t = \left(\frac{1}{1+\phi_p}\right) p_t^* + \left(\frac{\phi_p}{1+\phi_p}\right) p_{t-1} \;=\; p_{t-1} + \lambda_p (p_t^* - p_{t-1}) \quad \rightarrow \quad \lambda_p = \frac{1}{1+\phi_p}. \tag{8}$$

From this approach, we also can better specify what the target wage and prices are: They are the nominal goals that workers and firms could achieve if they were not subject to any adjustment costs. Hence, workers and firms move towards but do not quite achieve their goals because there is always at least some nonzero cost of conflict, i.e. the costs associated with resetting a wage or price (information gathering, deliberation, coordination, risk-taking, negotiating and so on).

There are a few caveats to consider in evaluating this approach. The elephant in the room, from a post-Keynesian perspective, are the loss functions and supposition of optimising behaviour. However, there is nothing inherent about the existence of adjustment costs that runs contrary to post-Keynesian tenets. If anything, the post-Keynesian emphasis on the concepts of fundamental uncertainty and fairness only reinforce the importance of what we have represented here in the form of ϕ_w and ϕ_p. From a post-Keynesian perspective, one can start instead from Equations (7) and (8) stipulated as such without presupposing that they follow from the minimisation of loss functions. After all, if we are willing to start from Equations 1 and 2 as is done in Woodgate (2026) and essentially any conflict inflation model that assumes some constant speed of adjustment parameters, why would we not be willing to begin with Equations (7) and (8), which is the same but there is now the additional useful clarification that the speed of adjustment parameters vary inversely with the adjustment costs?

If we are to insist on the (often useful) abstraction of homogeneity, then some kind of justification along these lines must follow. The downside is that the abstraction compounds in the sense that the nominal targets, for example, must then be interpreted as hypothetical—i.e., what *would* workers and firms desire *if there were* no adjustment costs. This paper argues instead for the second interpretation that is to follow not because this first interpretation with homogeneous groups and "costs of conflict" is theoretically untenable, but because it cannot explain as much or as elegantly as the following heterogeneous interpretation.

2.2 Heterogeneous workers and firms: Staggered contracts

The simplest way to introduce some degree of heterogeneity within our two groupings (workers and firms) is to suppose that they still share the same real wage targets but reset their wages and prices at different points in time. Regulations or conventions will dictate whether wages or prices are reset in any given quarter, say, implying that some workers or firms will be "stuck" until their turn or, indeed, chance comes about in the future. This reflects a reality of staggered contracts. The regular pay reviews of individual workers or the negotiations of labour unions do not align at the same point in time—indeed, they may not be regular at all. Firms' prices as set out in formal contracts likewise do not expire at the same point in time. Even firms whose prices are not bound by formal contracts may be thought of as being locked in informal contracts with their customers since sudden, unexplained or unexpected price increases damage goodwill, violate perceived fairness, and encourage buyers to switch to competitors, where the connection to the earlier discussion around adjustment costs is clear.[2] With this

[2] An example of an implied contract as well as a price adjustment cost is that of the Apple iPhone. In the roughly two decades since the release of the original iPhone, Apple has rarely changed the price of its latest iPhone in the year after its release, which since 2010 has nearly always been in September due to the conventions of their fiscal year reporting and high end-of-year spending. One of the few times it did break its "contract" was in September 2007, when Apple abruptly slashed the price of the original 8GB iPhone from $599 down to $399 just two months

in mind, throughout the remainder of the paper, we will use the term "contract" to mean both formal and informal contracts.

Staggered contracts have received a great deal of attention and a variety of treatments in New Keynesian economics. However, it ought to be emphasised that staggered wage and price setting is already an essential part of all post-Keynesian conflict inflation models. This is most explicit in the seminal work of Rowthorn (1977) and in the "Hein and Stockhammer" approach to conflict inflation (see, for instance, Hein (2023, ch. 5; 2025) for the origins and overview of this approach). In these models, a clear order of events is stipulated: workers first negotiate their wages and then firms set their prices. Of course, one could imagine an alternative model where instead prices are said to be set before wages. However, the precise order of events in conflict inflation models is generally immaterial, provided workers and firms do not adjust wages and prices synchronously. If labour and firms with conflicting real wage targets were to try to set homogeneous wages and prices simultaneously, the impossibility of satisfying the conflicting aspirations would become apparent to all. That wage and price setting must be staggered is a point which is inherent to all conflict inflation models, including those that do not specify an order of bargaining such as Dutt (1987) and the textbook versions it inspired (e.g. Lavoie 2022, ch. 8; Blecker and Setterfield 2019, ch. 5). As Lorenzoni and Werning (2023) make particularly clear in a moneyless economy, inflation is the result of just two vital ingredients: disagreement over relative prices (i.e. conflict) and unsynchronised wage and price setting (i.e. staggered contracts).

If staggered wage and price setting has always been embedded, explicitly or otherwise, in post-Keynesian conflict inflation models, then what is the novelty being proposed here? Rather than just supposing that wages and prices are set asynchronously, here we explicitly assume that there are many different cohorts of workers and firms, where each cohort resets their wage or price at different points in time. To do so, we again take some inspiration from New Keynesian thinking on the matter and then consider the suitability of the imported concepts with post-Keynesian tenets.

Contracts may be staggered deterministically, as in Taylor (1979), or stochastically, as in Calvo (1983). The deterministic approach supposes that each cohort of workers (firms) essentially takes turns resetting wages (prices). To repeat the example seen in Taylor (1979), we might assume workers' contracts run for a year, but half are renegotiated in January and the other half in July, such that the wage level in any half-year period is the simple mean of the wages of both cohorts. While simple to understand, the drawbacks of the approach are twofold. First, it may be too deterministic in the sense that there may, in truth, be plenty of workers (firms) for whom there is no guarantee of a wage (price) change within a given period of analysis. Second, and more importantly for our purposes, the mathematics associated with deterministically staggered contracts do not reduce to Equations 1 and 2 and so does not readily explain the λ parameters we wish to explain.

The stochastic approach of Calvo (1983), on the other hand, does exactly that, yielding an unambiguous and thus useful interpretation as to what the λ parameters mean. Following Calvo's (1983) staggered price-setting model[3], suppose there is a *probability* that an individual firm (worker) cannot change its price (wage) in any given period, which we denote θ_p and θ_w respectively. For an arbitrarily large number of cohorts of workers and firms, it follows that the wage (price) level is a weighted average of all the worker- (firm-) cohorts' distinct wages (prices)

$$w_t = (1-\theta_w)w_t^* + \theta_w(1-\theta_w)w_{t-1}^* + \theta_w^2(1-\theta_w)w_{t-2}^* + \theta_w^3(1-\theta_w)w_{t-3}^* + \cdots \quad , \tag{9}$$

$$p_t = (1-\theta_p)p_t^* + \theta_p(1-\theta_p)p_{t-1}^* + \theta_p^2(1-\theta_p)p_{t-2}^* + \theta_p^3(1-\theta_p)p_{t-3}^* + \cdots \quad . \tag{10}$$

after its launch, triggering a massive backlash from furious early adopters that forced Steve Jobs to issue a rare public apology and a $100 store credit (BBC News, 2007)—a clear example of an adjustment cost.

[3] More accurately said, we follow the discrete-time version of Calvo's approach as found in Rotemberg (1987).

Using the Koyck transformation, this reduces neatly to

$$w_t = (1-\theta_w)w_t^* + \theta_w w_{t-1} \quad \rightarrow \quad \lambda_w = 1-\theta_w, \tag{11}$$

$$p_t = \left(1-\theta_p\right)p_t^* + \theta_p p_{t-1} \quad \rightarrow \quad \lambda_p = 1-\theta_p, \tag{12}$$

such that each equation reflects an arbitrarily large number of cohorts of workers and firms despite only being comprised of the current nominal target and the lag. Equations (11) and (12) thus imply a definitive meaning for the λ parameters we wished to explain. At the micro level, the corresponding λ parameter is the *probability* that a given worker (firm) can reset its wage (price) in a given period. At the macro level, it is the *share* of workers (firms) that reset wages (prices) in that period or, equivalently, the *frequency* at which wages (prices) are reset.[4]

To understand the frequency interpretation, note that the expected duration of a wage (D_w) or a price (D_p)—i.e. the number of periods a wage or price is expected to last—is equivalent to the inverse of λ_w or λ_p respectively, as shown in Equations (13) and (14)

$$E[D_w] = \lambda_w + 2(1-\lambda_w)\lambda_w + 3(1-\lambda_w)^2\lambda_w + 4(1-\lambda_w)^3\lambda_w + \ \dots \ = \frac{1}{\lambda_w}, \tag{13}$$

$$E\left[D_p\right] = \lambda_p + 2\left(1-\lambda_p\right)\lambda_p + 3\left(1-\lambda_p\right)^2\lambda_p + 4\left(1-\lambda_p\right)^3\lambda_p + \ \dots \ = \frac{1}{\lambda_p}. \tag{14}$$

If wages, say, are found empirically to last x periods on average between renegotiations, then $\lambda_w = 1/x$ is the frequency at which wages change. Since $0 \leq \lambda_w, \lambda_p \leq 1$, the lower bound on expected durations of wages and prices is one period. Thus, a sufficiently short (typically quarterly or monthly) period of analysis must be considered.

That the reset probabilities can be directly linked to expected durations in this way is a useful result with important implications for the Generalised Conflict Inflation Model, as we shall see. We refer to the λ parameters as the *reset probabilities* or *reset frequencies* interchangeably throughout this paper. We also stress that by the word "reset" we mean a *deliberated* act of changing wages or prices, in contrast to the *automatic* changes caused by (a higher degree of) indexation, which we consider shortly.

Granted, the stochastic staggered contracts interpretation comes with its own form of conceptual strangeness. For example, it seems odd to suppose it is possible (if extremely unlikely for usual values of $0 < \lambda_w, \lambda_p < 1$) that a certain firm or labour union could be lucky enough to reset its prices or wages every period for, say, 10 periods but then be stuck with that price or wage for another 10 periods thereafter. That is to say, the drawback of the approach is that it seems overly stochastic at the micro level, in direct contrast to Taylor (1979). Yet, at the aggregate level, the law of large numbers smooths out the micro-level randomness across workers and firms. As a result, the stochastic approach captures aggregate rigidities just as effectively as deterministic models like Taylor (1979), but without the analytical burden of tracking individual cohorts over time. Calvo (1983) and many New Keynesians thereafter employed his related parameter in a context of rational expectations and optimising behaviour, but there is nothing about a reset frequency interpretation that is in and of itself inconsistent with a post-Keynesian model of conflict inflation.

[4] This frequency interpretation brings us broadly in line with that proposed by Serrano et al. (2024), albeit by very different means.

2.3 Indexation

Both the Rotemberg adjustment cost and Calvo reset probability interpretations of the speed of adjustment parameters also clearly motivate why indexation may become desirable to workers and firms. In the case of adjustment costs, indexing prices to lagged inflation does not incur the cost of managerial deliberation and is unlikely to cause backlash given that upward price and wage adjustments are standard during periods of positive trend inflation. Similarly, the automatic indexation of wages protects real wages to some extent without workers having to incur the cost of coordination, negotiation, or industrial action. In the case of stochastic staggered contracts, where some workers (firms) are stuck with the wage (price) from a previous period, no indexation means workers' real wage (firms' markup) is eroded for every period in which they are unable to reset their wage (price). The higher the rate of steady state inflation, the greater the real wage erosion for those unfortunate workers or firms. However, if there is some indexation of wages or prices, stuck workers and firms do not suffer the full extent of real wage or markup erosion.

Indexation is simple to incorporate into our model. Instead of Equations (1) and (2), we have Equations (15) and (16), where w_{t-1} and p_{t-1} are replaced by the automatically indexed wage and price, w_t^I and p_t^I respectively

$$w_t = \lambda_w w_t^* + (1-\lambda_w) w_t^I \qquad where\ w_t^I = w_{t-1}(1+\gamma_w \hat{p}_{t-1}), \tag{15}$$

$$p_t = \lambda_p p_t^* + \left(1-\lambda_p\right) p_t^I \qquad where\ p_t^I = p_{t-1}\left(1+\gamma_p \hat{w}_{t-1}\right). \tag{16}$$

$0 \leq \gamma_w, \gamma_p \leq 1$ are the degrees of indexation of wages and prices respectively. Of course, if both indexation parameters are equal to zero, then Equations (15) and (16) collapse back to where we started in Equations (1) and (2). Concretely, Equations (15) and (16) can be said to follow from the Rotemberg approach or the Calvo approach.[5] However, one must again bear in mind that while the equations look the same, the interpretations are vastly different.

Indexation has been incorporated into a number of previous conflict inflation models, most notably the textbook treatments seen in Lavoie (2022, ch. 8) and Blecker and Setterfield (2019, ch. 5). As in those models, we begin by assuming that the degrees of indexation are exogenously given. Contrary to those textbook models, we will show by adopting the stochastic staggered contracts approach, that the degree of indexation—and indeed the reset probabilities themselves—must be endogenous in the long run. To get to this result and others, we now add stochastic staggered contracts and indexation to the Generalised Conflict Inflation Model.

3. The Generalised Conflict Inflation Model with Contract Heterogeneity and Indexation

Inserting Equations (3) and (4) for the nominal wage and price targets into Equations (15) and (16), then expressing as growth rates (where hats denote growth rates) and simplifying we find our expressions for wage and price inflation as in Equations (17) and (18)

$$\hat{w}_t = \lambda_w \left[\frac{\tau_W}{\omega_{t-1}}(1+\hat{p}_t^e) - 1\right] + (1-\lambda_w)\gamma_w \hat{p}_{t-1}, \tag{17}$$

$$\hat{p}_t = \lambda_p \left[\frac{\omega_{t-1}}{\tau_F}(1+\hat{w}_t^e) - 1\right] + \left(1-\lambda_p\right)\gamma_p \hat{w}_{t-1}. \tag{18}$$

[5] In the Rotemberg approach, w_{t-1} and p_{t-1}in Equations (5) and (6) are replaced by w_t^I and p_t^I since only *deliberated* (not automatic) wage or price changes create adjustment costs for the reasons presented above. In the Calvo approach, it follows from including cumulative indexation of all lagged terms in Equations (9) and (10).

These wage and price inflation equations can be interpreted as weighted averages of two terms, where the weights are the shares of workers and firms who were able to renegotiate in current period t—these shares, as mentioned before, being λ_w and λ_p respectively. Those cohorts that reset wages or prices do so in accordance with the aim of achieving their distributional targets given the rate of inflation they expect in the current period. This first term could be termed the active component. The passive component is the second term in each equation, where the share of workers $(1-\lambda_w)$ and firms $(1-\lambda_p)$ who were unable to reset but nonetheless contribute to current wage/price inflation to the extent that their wages and prices are indexed to past inflation. If there is no indexation such that $\gamma_w = \gamma_p = 0$, then we are just left with the first term, which is exactly what is shown in Woodgate (2026).

If the system is stable, implying that the real wage, actual and expected inflation rates are constant over time, then the system reduces to

$$\hat{w} = \frac{\tau_W - \omega}{d_w\omega - \tau_W} \qquad where \;\; d_w = \frac{1-(1-\lambda_w)\gamma_w}{\lambda_w}, \tag{19}$$
$$\hat{p} = \frac{\omega - \tau_F}{d_p\tau_F - \omega} \qquad where \;\; d_p = \frac{1-(1-\lambda_p)\gamma_p}{\lambda_p}, \tag{20}$$

where, for simplicity, we drop the time subscript since all variables are now contemporaneous.

The composite parameters d_w and d_p are more than a collection of their underlying parameters. They can be interpreted as the *effective duration of wages and prices* respectively. This is more readily observed upon their rearrangement in Equations (21) and (22), where we can see that if there is no indexation ($\gamma_w = \gamma_p = 0$) then d_w and d_p are equivalent to the expected duration of wages and prices (D_w and D_p) seen in Equations (13) and (14)

$$d_w = \gamma_w + (1-\gamma_w)\frac{1}{\lambda_w}, \tag{21}$$
$$d_p = \gamma_p + (1-\gamma_p)\frac{1}{\lambda_p}. \tag{22}$$

If indexation were complete ($\gamma_w = \gamma_p = 1$), the effective duration would be one period, meaning wages and prices change every period. For any other degree of indexation, we see that the effective duration is a weighted average of expected contract duration ($1/\lambda$) and 1.

If d_w and d_p reflect effective durations, then their reciprocals, $1/d_w$ and $1/d_p$ can be seen as the *effective frequency of wage and price changes* respectively. This interpretation allows us to decompose any steady-state inflation rate across its extensive margin (how often wages and prices change) and intensive margin (size of each change), which can be derived from rearranging Equations (19) and (20)

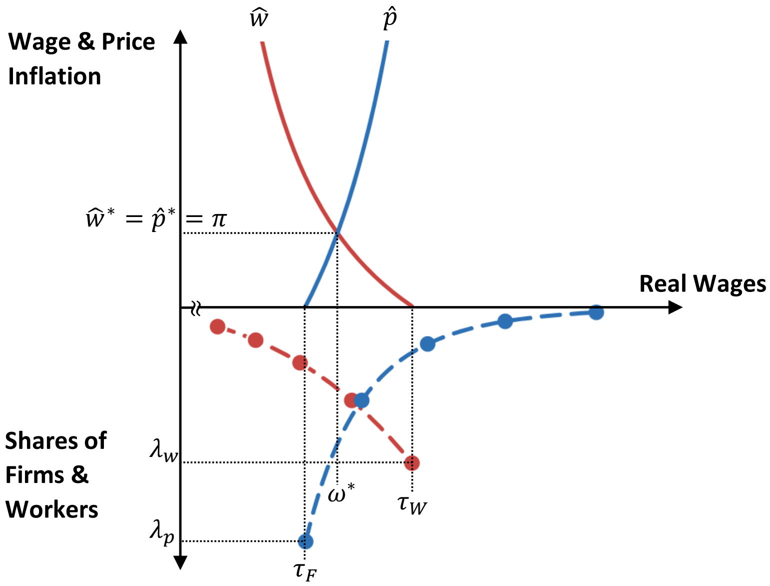
$$\hat{w} = \frac{1}{d_w} * \left[\frac{\tau_W}{\omega}(1+\hat{p}^e) - 1\right], \tag{23}$$
$$\hat{p} = \frac{1}{d_p} * \left[\frac{\omega}{\tau_F}(1+\hat{w}^e) - 1\right]. \tag{24}$$

With the first term in Equations (23) and (24) seen as effective frequencies, it follows that the bracketed terms capture the size of wage and prices changes, determined by real wage aspirations and inflation expectations.[6]

[6] These reduced form equations presume steady-state inflation, so expected inflation is equal to actual inflation. We express the intensive margin nonetheless in terms of expected inflation here for a more intuitive exposition.

While Equations (19) and (20) mirror the mathematical structure of Woodgate (2026), the stochastic staggered contract framework provides additional insight on the underlying distributions among workers and firms, illustrated in Figure 1. The upper panel shows the stable inflation curves $\hat{w}$ and $\hat{p}$ from Equations (19) and (20), where their intersection is shown to determine the equilibrium real wage (ω^*) and inflation rate ($\pi = \hat{w}^* = \hat{p}^*$). This panel looks essentially the same as Figure 1 from Woodgate (2026) except now we have truncated each stable inflation curve at its target real wage. This is done to allow space for the lower panel seen here, where we see how, unlike traditional models where workers and firms earn identical real wages, individual cohorts experience distinct real wages depending on when they last reset their contracts.[7]

Figure 1. *Equilibrium Inflation and Real Wage (Upper Panel), and Corresponding Distributions of Real Wages Among Workers and Firms (Lower Panel)*



In a steady state, the fraction of all workers that get to reset their wages λ_w receive their target τ_W in real terms. Cohorts stuck in contracts negotiated 1, 2, or i periods ago suffer cumulative inflation erosion, forming the downward-sloping discrete distribution of worker real wages shown in blue. Conversely, firm cohorts stuck in older price contracts suffer eroded markups (and thus higher real wages paid), forming the upward-sloping distribution shown in red.

To establish the exact relationship between the macro equilibrium ω^* and these underlying micro distributions, we must calculate the expected real wage across cohorts in steady state. We will show that ω^* is both the arithmetic mean of workers' real wages and the harmonic mean of firms' real wages in equilibrium, and that this, in fact, must be the case to ensure distributional shares of output add up to 100%.

[7] To keep Figure 1 uncluttered, only five cohorts are depicted (as dots) in the lower panel and, for further visual clarity, smooth dashed lines are drawn to connect these cohorts to their corresponding distribution.

3.1 Expected Value of Workers' and Firms' Real Wages in Equilibrium

Any steady state rate of inflation, π, erodes the value of the real wage (markup) of the cohorts of workers (firms) who were unable to reset their wage (price). Let us denote the per-period erosion of real wages by ϵ_w and the erosion of prices relative to wages by ϵ_p. In a steady state, these per-period erosion factors are

$$\epsilon_w = \frac{(1-\gamma_w)\pi}{1+\pi}, \tag{25}$$

$$\epsilon_p = \frac{(1-\gamma_p)\pi}{1+\pi}. \tag{26}$$

It follows that the per-period retention factors, which represent the proportion of purchasing power preserved from period to period, are given by $1-\epsilon_w$ and $1-\epsilon_p$ respectively.

Assuming real wages targets are constant over time implies the geometric distribution of real wages among workers and firms in equilibrium seen in the lower panel of Figure 1. The share (λ_w) who just reset get τ_w, the next share who got their target last period and have been stuck since ($\lambda_w(1-\lambda_w)$) now have a real wage of $\tau_w(1-\epsilon_w)$, the next share who got their target two periods and have been stuck since ($\lambda_w(1-\lambda_w)^2$) now have $\tau_w(1-\epsilon_w)^2$, and so on. This implies that the expected value of workers' real wage in equilibrium is

$$E(\omega_W) = \sum_{i=0}^{\infty} \lambda_w \tau_W \,(1-\lambda_W)^i (1-\epsilon_w)^i = \tau_W\left(\frac{1+\pi}{1+d_w\pi}\right). \tag{27}$$

Note that the infinite sum converges since $0 < (1-\lambda_w)(1-\epsilon_w) < 1$. Similarly for firms, we can show that the expected value of the inverse of their real wages is

$$E\left(\frac{1}{\omega_F}\right) = \sum_{i=0}^{\infty} \frac{\lambda_p}{\tau_F}(1-\lambda_p)^i (1-\epsilon_p)^i = \frac{1}{\tau_F}\left(\frac{1+\pi}{1+d_p\pi}\right) \tag{28}$$

Rearranging the stable inflation curves from Equations (19) and (20) for the real wage of workers (ω_W) and firms (ω_F) in terms of the steady state inflation rate,

$$\omega_W(\pi) = \tau_W\left(\frac{1+\pi}{1+d_w\pi}\right), \tag{29}$$

$$\omega_F(\pi) = \tau_F\left(\frac{1+d_p\pi}{1+\pi}\right), \tag{30}$$

it thus follows that the equilibrium real wage ω^* is a weighted arithmetic mean of all worker-cohorts' real wages and a weighted harmonic mean of all firm-cohorts' real wages

$$\omega^* = \omega_W(\pi) = \omega_F(\pi) \quad \rightarrow \quad E[\omega_W] = \frac{1}{E[1/\omega_F]}. \tag{31}$$

Indeed, in a conflicting claims framework, this must be the case, since

$$E\left[\frac{w}{p}\right] * E\left[\frac{p}{w}\right] = 1 \tag{32}$$

implies the distributional shares are compatible. In other words, in equilibrium, the product of workers' expected real wage $E[w/p]$ and firms' expected price markup over wages $E[p/w]$ is 100%.

3.2 Equilibrium and (In)stability

Now that we have a clearer idea of what ω^* represents, let us turn our attention to its precise solution. Equating (19) and (20) to find ω^* implies solving a quadratic of the form

$$\omega^2 + \omega\tau_F(d-1) - d\tau_F\tau_W = 0 \qquad where \qquad d \equiv \frac{d_p - 1}{d_w - 1}. \tag{33}$$

Again, a new composite parameter, d, is introduced. This can be interpreted as the ratio of the number of periods that prices are effectively stuck relative to wages, given that the first period, wherein wages or prices are reset, are subtracted from both terms. It follows that d is a measure of the *rigidity of prices relative to wages*. Solving for ω^* yields

$$\omega^* = \frac{1}{2}\left[\tau_F(1-d) + \sqrt{\tau_F^2(d-1)^2 + 4d\tau_F\tau_W}\right], \tag{34}$$

which, upon plugging into (19) or (20), gives the equilibrium rate of inflation

$$\hat{w}^* = \hat{p}^* = \pi = \frac{1 + d - \sqrt{(d-1)^2 + 4d\tau}}{1 - d + \sqrt{(d-1)^2 + 4d\tau} - 2d_p} \qquad where\ \tau \equiv \frac{\tau_W}{\tau_F}. \tag{35}$$

No conflict implies no inflation ($\pi = 0$ if $\tau = 1$), a lack of conflict implies deflation ($\pi < 0$ if $\tau < 1$), and conflict means inflation ($\pi > 0$ if $\tau > 1$).

However, *steady* inflation is incompatible with an excessive degree of conflict, what is termed "hyperconflict" in Woodgate (2026). From analysing the denominator of Equation (35), we can see that hyperinflation emerges when the following threshold is reached or surpassed

$$\tau^{hyper} = d_w * d_p. \tag{36}$$

In other words, if there is a lot of rigidity in the system (low frequency of wage and price changes and low or no indexation leading to high effective durations of wages and prices, d_w and d_p), a lot more conflict can be withstood before instability is triggered. Conversely, as indexation tends to one *or* the reset probabilities tend to one (both leading to effective durations of one), the economy tends to a point of utmost fragility where any degree of conflict, no matter how small, leads to instability.

As in Woodgate (2026), this hyperconflict boundary can also be observed graphically. Stability requires that these two steady-state inflation curves intersect, which can only be the case if the vertical asymptote of wage inflation curve is below the vertical asymptote of price inflation curve. Following Woodgate (2026), we call the former the *barrier wage of workers* (b_W) and the latter the *barrier wage of firms* (b_F), which follow from setting the denominators of Equations (19) and (20) to zero, yielding

$$b_W = \tau_W/d_w \qquad and \qquad b_F = \tau_F * d_p. \tag{37}$$

Equating $b_W = b_F$ yields τ^{hyper} from Equation (36). Intuitively, hyperinflation reigns at the point of excessive conflict because the inflation-attenuating effects of rigidities in the system are no longer strong enough to prevent expected—and thus actual—inflation from becoming unanchored. This can be readily observed by plugging b_W or b_F into Equations (17) or (18). The result is of the form $\hat{x}_t =$

$\hat{x}_{t-1} + C$ or, equivalently, $\hat{x}_t^e = \hat{x}_{t-1} + C$ upon imposing the steady state condition ($\hat{x}_t = \hat{x}_{t-1} = \hat{x}_t^e$), where x denotes wages or prices and C is a positive constant. This implies a contradiction and hence a steady state is simply impossible when the barrier wages collide, that is, when hyperconflict sets in.

3.3 Useful approximations for ω^* and π

As in Woodgate (2026), we also suggest approximate solutions for ω^* and π, which are more intuitive and thus easier to interpret than the precise solutions in Equations (29) and (30). Differing from Woodgate (2026), however, here we show that ω^* is in fact better approximated by a *generalised mean* of τ_F and τ_W rather than the geometric mean offered there.

By taking a second-order Taylor series approximation of ω^* around $\tau = 1$, we show in the appendix that the equilibrium real wage is essentially a weighted generalised mean of τ_F and τ_W, where the weights and powers are both determined by the relative rigidity of prices to wages, d

$$\omega^* \approx \left[\frac{d}{1+d}\tau_W^\rho + \frac{1}{1+d}\tau_F^\rho\right]^{\frac{1}{\rho}} \qquad where\ \rho = \frac{1-d}{1+d}. \tag{38}$$

This approximating function is *exactly* equal to the true value of ω^* when…

- $\tau = 1$ (real wage targets are equal) and so the relative rigidity is irrelevant,
- $d \to 0$ (wages are infinitely more rigid than prices) and so $\omega^* = \tau_F$,
- $d \to \infty$ (prices are infinitely more rigid than wages) and so $\omega^* = \tau_W$, and
- $d = 1$ (prices and wages are equally rigid) and $\omega^* = \sqrt{\tau_W \tau_F}$. [8]

Otherwise, the error term introduced by this approximation is vanishingly small for all other values of d for an economically meaningful range of the degree of conflict, τ, and far smaller than the error introduced by the weighted geometric mean approximation seen in Woodgate (2026).[9] Moreover, this generalised mean approximant yields convenient expressions for the elasticities of the real wage with respect to workers' target real wage ($\varepsilon_{\tau_W}^{\omega^*}$) and firms' target real wage ($\varepsilon_{\tau_F}^{\omega^*}$)

$$\varepsilon_{\tau_W}^{\omega^*} = \frac{d\tau^\rho}{1+d\tau^\rho} \qquad \text{and} \qquad \varepsilon_{\tau_F}^{\omega^*} = \frac{1}{1+d\tau^\rho}. \tag{39}$$

These elasticities provide another way of contextualising the effects of the relative rigidity of prices to wages, d. If $d \to 0$, a one percentage increase in workers' (firms') target leads to a zero (one) percent increase in the equilibrium real wage. If $d \to \infty$, a one percentage increase in workers' (firms') target leads to a one (zero) percent increase in the real wage. If $d = 1$, the rigidities are balanced and do not favour workers nor firms: a one percentage increase in either workers' or firms' target leads to a 0.5% increase in the actual real wage.

We approximate steady-state wage and price inflation π with

$$\pi \approx k\left(\frac{\tau - 1}{\tau^{hyper} - \tau}\right), \tag{40}$$

[8] Note that the generalised mean function is defined by the geometric mean when $\rho = 0$.
[9] By "economically meaningful", we can make use of the hyperconflict limit discussed earlier. For instance, if wages and prices are found to both endure for 2 periods on average, the upper bound for τ is 4. We can show that for $0.25 < \tau < 4$, (i.e. if one target is up to four times larger than the other), the size of the *maximum* relative error introduced by this generalised mean approximation is less than 2% across all values of d, where it is closer to 10% for the weighted geometric mean approximation. For more on this, see the appendix.

where k is some constant found in the appendix to be $k = (d + d_p)/(d + 1)$. This approximation differs slightly to that seen in Woodgate (2026), but otherwise provides a similarly simple and intuitive way to understand steady state inflation: A lack of conflict begets deflation ($\tau < 1$), no inflation follows when the targets are aligned ($\tau = 1$), there is a positive rate of steady inflation for any usual degree of conflict ($1 < \tau < \tau^{hyper}$), whereas hyperinflation emerges as the degree of conflict tends to its explosive threshold ($\tau \rightarrow \tau^{hyper}$).

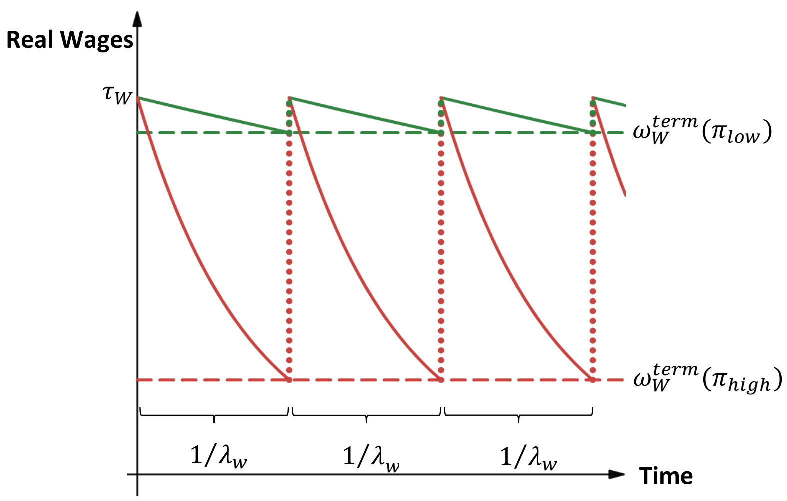
3.4 Inequality Among Cohorts: Erosion of Real Wages and Markups in Equilibrium

We know that higher rates of inflation erode the real incomes of "stuck" workers and firms, widening the distributions of real wages among workers and firms seen in the lower half of Figure 1, but by how much precisely?

To this end, we introduce the concept of the *terminal wage*. Suppose a worker or firm is subject to a contract duration equal to the expected duration, which we recall from Equations (13) and (14) is $1/\lambda_w$ for workers and $1/\lambda_p$ for firms. Further suppose they experience a steady-state rate of inflation over the course of that contract. We define the terminal wage as the real wage experienced by this "representative" worker (firm) immediately before their contract ends and their wage (price) finally resets.

We illustrate the concept of the terminal wage using the example of workers in Figure 2. For visual clarity, the discrete-time period-by-period erosion process of our model is rendered instead as a continuous curve $\omega(t) = \tau_W (1 - \epsilon_w)^t$ over many contract durations ($D_w = 1/\lambda_w$), which are marked by vertical dotted lines. The upper bound represents the target real wage τ_W, while the lower bound shows the terminal wage ω_W^{term}, denoted by dashed horizontal lines, which are reached immediately prior to contract reset. This sawtooth evolution of the representative worker's real wage is shown for a low rate of steady-state inflation (π_{low}) in green and a high rate (π_{high}) in red, where the latter case implies a relatively high degree of variation over time and a low real wage trough.

Figure 2. ***Terminal wages of workers given low and high rates of steady-state inflation***



Incorporating this into our discrete-time model, a contract of expected duration implies that there are $1/\lambda - 1$ periods of erosion of workers' or firms' real wage, leaving us the following expression for the terminal wage of workers (ω_W^{term}) and firms (ω_F^{term})

$$\omega_W^{term} = \tau_W(1-\epsilon_w)^{\left(\frac{1-\lambda_w}{\lambda_w}\right)}, \tag{41}$$

$$\omega_F^{term} = \tau_F\big(1-\epsilon_p\big)^{-\left(\frac{1-\lambda_p}{\lambda_p}\right)}, \tag{42}$$

where the per-period erosion factors ϵ_w and ϵ_p are as defined in Equation (25) and (26). If there is no steady-state inflation, workers (firms) that received their target suffer no erosion ($\epsilon_w = \epsilon_p = 0$) over the duration of their contract and so their terminal wage is equal to their target. However, for any positive rate of inflation, workers' (firms') terminal wage must be lower (higher) than their target—potentially to an extremely uncomfortable extent in the event of high inflation.

The ratio of terminal wages to real wage targets thus serves as a simple measure of spread of real wages of workers and firms in equilibrium, one that clearly increases with the rate of steady state inflation, π. As π tends to infinity, the bounds on this measure of spread are set by the degrees of indexation and the reset frequencies such that

$$\lim_{\pi \to \infty} \frac{\omega_W^{term}}{\tau_W} = \gamma_w^{\left(\frac{1-\lambda_w}{\lambda_w}\right)}, \tag{43}$$

$$\lim_{\pi \to \infty} \frac{\omega_F^{term}}{\tau_F} = \gamma_p^{-\left(\frac{1-\lambda_p}{\lambda_p}\right)}. \tag{44}$$

Importantly, terminal wages are *not* bound by the barrier wages discussed earlier, which only constrain *expected* real wages under the condition of stable inflation.[10] Hence, low degrees of indexation and/or low reset probabilities imply that the real wage trough (peak) that workers (firms) suffer under high inflation may be unbearably small (large) in relation to their target or, indeed, their expected minimum (maximum) real wage—that is, their barrier wage. This may imply a certain destitution for workers and bankruptcy for firms.

Rather than accept such a dire fate, which ultimately arises from outdated conventions and regulations around wage- and price-setting, both sides may very reasonably opt to break those conventions or push for new norms (i.e. increase λ or γ). The implication is that, over the long run, the effective durations of wages and prices are endogenously determined, both shrinking as trend inflation rises. This prediction is indeed supported by the empirical literature, which shows a clear negative relationship between trend inflation and the duration of wages and prices (for example, see Gödl and Gödl-Hanisch (2024) for wage contract duration and Alvarez et al. (2019) for price adjustment frequency across various inflation regimes).

4. Hyperconflict Revisited: Endogeneity of the Effective Duration of Wages and Prices

This penultimate section is an attempt to endogenise the effective duration of wages (d_w) and prices (d_p) over the long run. To do so, let us clarify what is meant by long run, and how it relates to the short and medium run. If the short run sees inflation expectations as exogenously given as in Equations (17) and (18) and the medium run concerns the taming of those expectations by equilibrium inflation and real wages as in Equations (29) and (30), then the long run that we are about to entertain involves the

[10] This is most readily observed by taking the limit of Equations (27) and (28) as inflation tends to infinity.

adjustment of the institutional parameters (λ and γ and thereby d) in response to an uncomfortably high rate of medium-run equilibrium inflation. As we now move the analysis from a time-dependent medium run to a state-dependent long run, we make explicit that we are now engaged in comparative statics across institutional regimes by employing the subscript r. A few assumptions are needed to keep matters tractable.

4.1 Further assumptions

We assume that the effective durations of wages and prices in a given inflation regime, d_r^w and d_r^p, take on exogenously given values, d_0^w and d_0^p respectively, when trend (i.e. medium-run) inflation is zero. We then suppose that d_r^w and d_r^p fall in response to the experience of a higher inflation regime (π_{r-1}) and tend to one—their lowest possible value—in the hypothetical infinite inflation regime (i.e. as $\pi_{r-1} \to \infty$). This is captured in Equations (45) and (46)

$$d_r^w = d_0^w + (1 - d_0^w)\frac{\pi_{r-1}}{1 + \pi_{r-1}}, \tag{45}$$

$$d_r^p = d_0^p + \left(1 - d_0^p\right)\frac{\pi_{r-1}}{1 + \pi_{r-1}}. \tag{46}$$

The term $\pi/(1 + \pi)$ can be viewed as a kind of measure of inflation salience. When trend inflation is close to zero, it matters little for workers or firms (inflation salience close to zero), whereas high rates of trend inflation are highly salient (closer to one) and lead to the lowest possible effective durations. Lastly, let us emphasise that we do not explicitly model the reaction of the reset frequencies (λ) or degrees of indexation (γ) across different medium-run inflation regimes, just the effective durations that they comprise. While it may be reasonable to suppose that in response to the emergence of a higher inflation regime that the frequency of deliberated resetting rises before automatic indexation is introduced or increased, it matters little to our model and its outcomes, and so we stick the simpler approach seen here.

An important implication of this approach is that while the effective durations of wages and prices fall with trend inflation, they do so in a way that leaves the *relative rigidity of prices to wages* (d) as a constant over the long run

$$d = \frac{1 - d_r^p}{1 - d_r^w} = \frac{d_0^p - 1}{d_0^w - 1}. \tag{47}$$

Recall that d determines the equilibrium real wage, ω^*, but d_r^p and d_r^w do not. Crucially, then, while workers and firms shorten contract durations defensively—protecting themselves against real income erosion during high inflation—the implication is that they cannot leverage adjustment frequency to extract a structural distributional advantage. The assumption is that if securing a higher real wage or profit margin were as simple as increasing reset frequencies, that option would already be exhausted, yielding only retaliatory tit-for-tat spirals or regulatory intervention. Hence, we see the relative term d as a reflection of exogenously fixed *bargaining power*, whereas d_r^p and d_r^w are absolute terms that both fall as trend inflation rises and workers and firms expend *bargaining effort* towards achieving more frequent negotiations or indexation.[11]

[11] The distinction between bargaining effort and power is introduced by Bastian and Setterfield (2015). However, these authors suppose that workers' and firms' bargaining effort, which they denote μ and ϕ, is bounded by the bargaining power of either side, μ_{max} and ϕ_{max}. In this paper, bargaining power is a relative term (d) rather than two distinct absolute terms, and here bargaining effort is seen as what pushes down effective durations, d_r^p and d_r^w, which are ultimately instead bounded by a logical extreme of one (where $\lambda_w = 1$ or $\gamma_w = 1$ for workers, and $\lambda_p = 1$ or $\gamma_p = 1$ for firms).

4.2 Stability analysis given endogenous effective durations of wages and prices

Referring back to the solutions seen in Equations (29) and (30), the implication of falling d_r^w and d_r^p but a constant d is that the long-run inflation rate may rise indefinitely while the real wage remains constant. To determine whether endogenous effective durations lead to hyperinflation, we insert Equation (46) into (30) and, for convenience, define $N = 1 + d - \sqrt{(d-1)^2 + 4d\tau}$, yielding

$$\pi_r = \frac{-N(1+\pi_{r-1})}{N(1+\pi_{r-1}) + 2(d_0^p - 1)}. \tag{48}$$

Thus, long-run inflation changes over inflation regimes according to

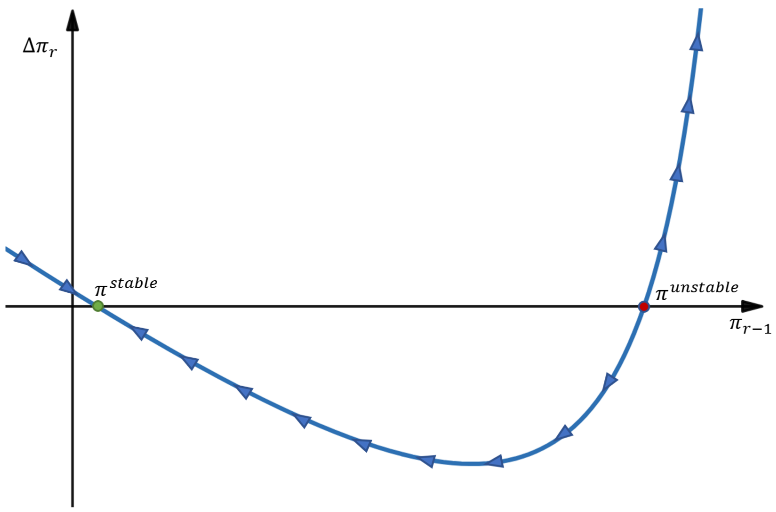
$$\Delta\pi_r = \frac{\pi_{r-1}^2 + B\pi_{r-1} + 1}{1 - B - \pi_{r-1}} \qquad \text{where } B = 2\left[1 + \frac{d_0^p - 1}{N}\right]. \tag{49}$$

Analysis of the numerator of Equation (49) is sufficient to determine under what conditions the system is stable. For stability, given a positive rate of inflation, it must be the case that $B \leq -2$, which yields a concave up quadratic where the smaller of the two roots is stable and the larger is unstable, as depicted in Figure 3. By Vieta's formula, we know that the product of the two roots of this quadratic must be one, or equivalently that

$$\pi_r^{unstable} = \frac{1}{\pi_r^{stable}}. \tag{50}$$

Hence, if an economy experiences a stable inflation regime at 10%, the implied threshold for instability in this hypothetical economy would be an inflation rate of 1000%. Generally, the lower the stable rate of long-run inflation, the more that economy can withstand higher rates of inflation without setting off explosive dynamics.

Figure 3. ***Phase Diagram with a Stable Equilibrium and a Hyperinflationary Tipping Point***



Expressing this instability tipping point in terms of the degree of conflict τ rather than inflation rates, $B = -2$ implies that

$$\tau_{endog}^{hyper} = \left(\frac{d_0^w + 3}{4}\right)\left(\frac{d_0^p + 3}{4}\right). \tag{51}$$

Hence, hyperinflation results for any degree of conflict τ greater than or equal to this threshold value. Compared to the earlier setup where the effective durations of wages and prices were exogenously fixed $\left(\tau_{exog}^{hyper} = d_0^w d_0^p\right)$, it follows that instability is now, as expected, more likely, since

$$\tau_{endog}^{hyper} \leq \tau_{exog}^{hyper}. \tag{52}$$

In other words, endogeneity of the reset frequencies and indexation parameters does not rule out macroeconomic stability over the long run, but it does make hyperinflation more likely as it further reduces the degree of conflict that the economic system can withstand. This implies a higher degree of fragility than that found in the related model in Woodgate (2026) without this endogeneity channel, and provides a theory for what may determine the hyperinflationary tipping points that are simply taken as given in, for example, Rowthorn (1977) and Bastian and Setterfield (2015).

5. Concluding remarks

That the reset frequencies (λ) and degrees of indexation (γ) may vary endogenously with inflation over the long run is not only relevant for the emergence of hyperinflation, it also provides insight on the topic with which we began, namely the meaning of the speed-of-adjustment parameters in conflict inflation models. More than just being parameters exogenously determined by bargaining power or institutions and norms, as is often mentioned in the literature, here we see them as long-run variables largely shaped by a lived experience or collective memory of inflation and distributional struggle. A simple but important corollary of this insight is that an increase in the degree of wage indexation, for instance, can only be considered as an increase in the bargaining power of workers if it is *not* matched by an equal or larger increase in the degree of indexation prices, ceteris paribus. In other words, more frequent wage or price changes are perhaps better viewed as the result of high trend inflation—in the present or in the past—than a reflection of bargaining power *per se*.

Further work could examine the reversibility of higher reset frequencies and degrees of indexation in a political economy or historical context. A national economy like that of Belgium is curious in this regard, since it retains a degree of indexation—relatively high by a modern international comparison—that dates back to an episode of high inflation in the aftermath of World War 1. The Belgian experience, and that of some Latin American economies, suggest the effective durations of wages and prices may ratchet downward with rising inflation rather than be fully reversible as implied by Equations (45) and (46). The implication is that an economy subject to such hysteresis may inherit a shorter default effective durations of wages and prices (lower d_0^w and d_0^p in our model) from the past. In which case, the results from the previous section suggest that what is gained in protection of cohorts' real income comes at the cost of macroeconomic fragility. Yet if the results of this model are applicable for a country like Belgium, with an average and roughly stable inflation rate of about 2.5 percent over the last 20 years, then Equation (45) would imply an instability threshold of around 4,000 percent—hardly a low tolerance for inflation. While we cannot take such back-of-the-envelope results seriously without empirical work on validation and calibration, this is indicative of the kind of future avenues for research and policy assessments that this work may motivate and support.

A few comments on the limitations of the approach taken here. Besides ignoring the possibility of ratcheting and hysteresis in wage- and price-setting institutions as just mentioned, the functional form employed to convey how effective contract durations change over different inflation regimes in Equations (45) and (46) is, while intuitive, ultimately ad hoc and may need better grounding. While we introduced some degree of heterogeneity across workers and firms, it is clear that there is still some way to go in this regard, where heterogeneous real wage targets being a natural extension. More obviously yet, we abstracted away from monetary and fiscal policy, as well as feedback effects via aggregate demand, to isolate the issues analysed here.

In sum, we have shown that certain aspects of New Keynesian rigidity theory can help resolve ambiguities in post-Keynesian conflict inflation models without violating post-Keynesian principles. We found the stochastic staggered contracts approach particularly fruitful, as it allows for a degree of heterogeneity without much greater complexity, a clear mapping of reset frequencies to the speed-of-adjustment parameters, and, due to the erosion effects on real income of equilibrium inflation, a rationale for why these parameters and the degree of indexation are endogenous in the long run, with significant implications for the post-Keynesian theory of hyperinflation.

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Appendix: Approximating the Equilibrium Real Wage and Inflation Rate

We begin by approximating ω^* by first dividing the precise solution in Equation (34) and find the second-order Taylor series expansion of the resulting function at $\tau = 1$

$$\frac{\omega^*}{\tau_F} \approx 1 + \frac{d}{1+d}(\tau - 1) - \frac{d^2}{(1-d)^3}(\tau - 1)^2. \tag{A1}$$

A generalised mean of τ_W and τ_F with weight and power parameters, σ and ρ,

$$\omega_a^* = \left[\sigma \tau_W^\rho + (1-\sigma)\tau_F^\rho\right]^{1/\rho} \tag{A2}$$

is proposed as an approximant (ω_a^*) for the precise solution (ω^*). The Taylor series of ω_a^*/τ_F is thus

$$\frac{\omega_a^*}{\tau_F} \approx 1 + \sigma(\tau - 1) + \frac{\sigma(1-\sigma)(\rho - 1)}{2}(\tau - 1)^2. \tag{A3}$$

Mapping the parameters from (A1) to the corresponding terms in (A3) gives $\sigma = d/(1+d)$ and $\rho = (1-d)/(1+d)$. With σ and ρ so defined and inserted into Equation (A2), we complete the derivation of Approximation (38) in the main text. Comparing ω^*/τ_F to ω_a^*/τ_F graphically reveals that the maximum absolute relative error across all values of d is 0.2% when $\tau = 2$, 1.8% when $\tau = 4$, and 6.5% when $\tau = 8$. For all values of d and τ, relative error is below that resulting from the approximant used in Woodgate (2026)

To approximate the equilibrium inflation rate, we start with the precise solution in Equation (35) and make use of the conjugate of the numerator in a first step, and then rearrange to yield

$$\begin{aligned} \pi &= \frac{1 + d - \sqrt{(d-1)^2 + 4d\tau}}{1 - d + \sqrt{(d-1)^2 + 4d\tau} - 2d_p}\left(\frac{1 + d + \sqrt{(d-1)^2 + 4d\tau}}{1 + d + \sqrt{(d-1)^2 + 4d\tau}}\right) \\ &= \left[1 + \frac{2(d_p - 1)}{d + 1 + \sqrt{(d-1)^2 + 4d\tau}}\right]\frac{\tau - 1}{\tau^{hyper} - \tau}. \end{aligned} \tag{A4}$$

Note that the important characteristics of this function—namely the root at $\tau = 1$, vertical asymptote at τ^{hyper}, and monotonically increasing gradient—are captured by $(\tau - 1)/(\tau^{hyper} - \tau)$. The term in square brackets adjusts the precise gradient and behaviour near (the economically meaningless) case where $\tau = 0$. We approximate the bracketed term by its zeroth-order Taylor series for simplicity and because it outperforms higher order Taylor series approximation, though smaller error can be achieved through other means of approximation—see, for example, the method of interpolation used in Woodgate (2026). Our simpler approach yields

$$\pi \approx \left[\frac{d + d_p}{d + 1}\right]\frac{\tau - 1}{\tau^{hyper} - \tau}, \tag{A5}$$

which is the result seen in the main text, where $k = (d + d_p)/(d + 1)$.

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