

# Battling Phillips Curves: Stagflation

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As promised last week, this post digs deeper into stagflation decade. The episode of simultaneously high unemployment and inflation that began in the early 1970s was the 20<sup>th</sup> century's second most damaging macro crisis, ranking below only the 1930s Great Depression. It is revealing that many decades later the macro academy continues to have a poor grasp of that massive market failure.

The analysis that follows is presented as a contest of Phillips curves. There are two contestants. In one corner is the mainstream champion, the Rational-Expectations PC constructed in response to stagflation by the formidable Robert Lucas. In the other is the GEM Project's champion, the Generalized-Exchange PC more recently constructed by yours truly.

## Stagflation Facts

An array of facts, beyond the simultaneity of high inflation and unemployment, provides insight into the stagflation decade. The evidence organizes itself in three interrelated buckets: labor-adverse shifts in the terms of trade, the price-wage-price spiral, and the nature of joblessness.

*Terms-of-trade shift.* There was, in the early 1970s, a powerful confluence of terms-of-trade shifts against labor. Contemporaneous stagflation analysis assigned a central role to those real disturbances in the destructive macrodynamic process:

- The quadrupling of oil prices, associated with the OPEC embargo, in 1973 was the largest single shock. By the end of the stagflation decade, the cartel had helped engineer a more than a fifteen-fold price increase.
- Food prices more than doubled in the early 1970s. The 1972 Russian crop failure put substantial pressure on world grain markets. Meanwhile, there was a mysterious collapse in the anchovy catch off Peru; and meat prices jumped as animal-feed (produced from grain or fishmeal) costs rose sharply.
- The over-valued dollar became unsustainable, and subsequent depreciation and higher import prices further pressured real wages. The gold window was closed in mid-1971 as a prelude to the Smithsonian agreement, which realigned the fixed rates of dollar exchange. That change was followed, in 1973, by two additional dollar devaluations.

*Price-wage-price spiral.* The virulent price-wage-price spiral, demonstrating sustained nominal feedback that surprised economists, is at the heart of stagflation mechanics. Any theorist assembling a policy-relevant explanation of the disruptive, costly stagflation decade cannot ignore the existence and implications of that extraordinary feedback. Annable (1984), the most careful empirical analysis of interacting wages and prices in the 1970s, identifies three associated facts. First, roughly half – not all – nonfarm nonsupervisory workers were able to defend their real wages against the labor-adverse terms-of-trade shifts. Second, those employees were concentrated in large bureaucratic firms or smaller unionized (typically construction) establishments. Third, after decades of stability, the inter-industry wage structure came apart, becoming substantially more dispersed. Statistical analysis identifies the sharp jump in energy and food prices as the central determinant of the shift. Many capital-intensive, highly specialized firms were burdened with sharply higher labor costs around the same time that postwar reconstruction, especially in Germany and Japan, was heating up the global competition in industrial goods.

*Nature of unemployment.* Relevant evidence leaves no doubt that, in the stagflation-related recessions of 1974-75, 1980, and 1981-82, involuntary job loss was the overwhelming engine of rising unemployment. Job-losers incidence rose by 16.0, 7.4, and 11.2 points respectively during the three contractions, which is roughly in line with the more recent 2007-09 experience when three-quarters of the increase in overall unemployment was attributable to the upsurge in layoffs.

As readers of this Blog know, the neoclassical general-market-equilibrium model class used by Lucas and other anti-Keynesians in their stagflation analysis cannot rationally suppress labor-price recontracting and consequently cannot accommodate involuntary job loss. As a result, today's consensus story pushes cannot make any serious effort to understand the high unemployment that combined with the decade's high inflation to produce stagflation. It is the familiar macro conundrum that plagues market-centric general-equilibrium

thinking. Wage recontracting must be, but cannot be, rationally suppressed. Given the coherency rules governing the New Neoclassical Synthesis, modern mainstream theorists have never been able to adequately elucidate the unemployment part of the stagflation story.

**The Contenders**

*Rational-Expectations Phillips Curve.* Led by Robert Lucas and emboldened by the 1970s failure of the mainstream EK wage model, new neoclassical theorists focused on how nominal wages adjust to price inflation and reasonably argued that product-price expectations must be constructed on the cost-effective use of available information. Rational-expectations (RE) theory rejects systematic errors implicit in EK adaptive expectations. The adjustment of wages for price inflation became forward-looking:

$$w(t) = a_0 + a_1(U^N - U(t)) + E_t p(t+1) + \varepsilon(t),$$

where  $E$  denotes expectations rationally constructed on the cost-effective use of available information. (The other variables were defined last week.) The RE elimination of systematic influences from the past produced disarray in macro stabilization analysis and complicated policymaking. Labor pricing no longer demonstrates short-term market independence, critical assumptions no longer suppress wage recontracting, and discretionary government interventions in total nominal spending no longer induce robust real (as well as nominal) effects. In the revived neoclassical market-centric world, stagflation results from upward shifts in both inflation expectations and the natural rate of unemployment ( $U^N$ ).

Roger Farmer (2010, p.60) succinctly captures the mainstream story: “During the 1970s, the U.S. economy experienced high inflation and high unemployment at the same time and the data did not lie anywhere near the Phillips curve.... The Phillips curve broke down because firms and workers began to increase wages and prices in an inflationary spiral. Wages went up because workers believed that prices would rise. Prices went up because higher wages were passed on to consumers.” In the consensus narrative, causality is rooted in the collapse of the credibility of the central bank’s commitment to low, stable price inflation and its effect on expectations. The major policy implication is that more convincing central-bank commitment to low and stable price inflation would have prevented the huge welfare loss of the stagflation decade. (For elaboration, see next week’s post.)

*GEM two-venue Phillips curve.* The generalization of rational exchange from the marketplace to information-challenged workplaces enables the derivation of the GEM Project’s Phillips curve:

$$w(t) = b_0 + b_1(U^N - U(t)) + b_2 p_t(t) + b_3(E_t p^M(t+1) - E_{t-1} p^M(t)) + e(t).$$

The reduced-form equation introduces powerful innovations.  $\underline{p}$  is the price-inflation lag structure ( $t-k$  to  $t$ ) rooted in rational catch-up and  $p^M$  denotes the central bank’s trend inflation objective, which is the focus of rational expectations. The central difference, of course, is the inclusion of two (marketplace and workplace) venues of rational wage determination, which are merged in the GEM Phillips equation. The workplace venue crucially incorporates meaningful wage rigidity into the reduced-form model. Rational MWR enables both the price-wage-price spiral at the heart of stagflation dynamics and the millions forced layoffs (as well as evidence-sized movement in total production, jobs and incomes) that result from the Fed-induced adverse nominal demand contractions that occurred during the stagflation decade.

Moreover, relative to market-centric RE Phillips curves, the generalized-exchange equation imposes a tight structure  $b_i$ . (See Chapter 4 in the website’s e-book.) The constant term ( $b_0 = \Phi r^n + (1 - \Phi)\gamma^m$ ) reflects the interaction of trend LEV real wage growth ( $r^n$ , embedded in established reference standards,  $\mathbf{K}_j$ ), small-firm trend productivity growth ( $\gamma^m$ ), and relative venue size ( $\Phi$ ). To the extent that any of those factors change in an estimation period,  $b_0$  is unstable. The most critical source of destabilization is  $\mathbf{K}$  recalibration, which the GEM Project has shown to be restricted to nonstationary demand contractions. Stationary business cycles are the usual context for Phillips-Curve analysis. Also, the employment coefficient ( $b_1 = (1 - \Phi)a_1$ ) helps explain the typically small estimated influence of measured joblessness on wage behavior.

Finally, the specification of inflation catch-up ( $p_t(t) = \Phi(t)\beta\sigma p_k^n(t) + \Phi(t)\beta(1 - \sigma)p_k^m(t) + \Phi(t)(1 - \beta)p_k^l(t)$ ) and LEV terms-of-trade dynamics ( $b_t(t) = \beta\sigma p_k^n(t) - \Phi\beta(1 - \sigma)p_k^m(t) - (1 - \beta)p_k^l(t)$ ) provide consequential restrictions on the generalized-exchange Phillips relation. Domestic or international shifts in labor’s terms of trade make  $b_2$  unstable. As a result, the compact GEM reduced-form wage equation demonstrates that all Phillips curves, with their implicit simplifying assumptions ( $p^n = p^m = p^l$ ,  $\Delta g^{m*} = 0$ ,  $\Delta F = 0$ ,  $\Delta U^N = 0$ ),  $\Delta m = 0$ ), would be unstable during the stagflation decade. (Again, see Chapter 4 of the e-book.)

Beyond the stagflation decade, higher labor costs chronically damaged large-firm profits, job destruction

(downsizing) increased, and wage givebacks, i.e.  $K$ , recalibrations, eventually occurred. In the more dispersed wage structure of the 1980s to the present in the United States, a labor-adverse terms-of-trade shock can no longer support stagflation. Instead, the terms of trade shift will, in today's circumstances, generally depress real wages. Next week's post elaborates on the extraordinary events that followed, and were influenced by, the stagflation decade.

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