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THREE PRINCIPLES FOR DEMAND-LED GROWTH

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ABSTRACT

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Three Principles for Demand-Led Growth

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Abstract

This article proposes three necessary and sufficient principles as a foundation for the claim that the dynamic path of aggregate demand is the primary determinant of economic growth beyond the short run. (1) Demand drives production and employment. (2) Neither endogenous nominal adjustment nor wise monetary policy reliably restores aggregate demand to a level consistent with full employment. (3) Endogenous responses of labor productivity and labor force growth to the state of the economy cause aggregate supply to accommodate the long-run path of aggregate demand. Together, these principles imply there is neither a long-run growth rate nor an equilibrium “natural” unemployment rate determined independently from the dynamics of aggregate demand. Instead, demand growth is the primary determinant of economic growth beyond the short run and the equilibrium unemployment rate adjusts to allow supply to accommodate the demand path (subject to a constraint imposed by a minimum unemployment rate). The article also summarizes historical and statistical evidence consistent with the three principles.

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The idea that aggregate demand affects production and employment in market economies defines Keynesian macroeconomics. While most (although not all) macro theories and practical policy analysis include Keynesian features, in the standard consensus perspective (also typically designated as “mainstream” or “orthodox”) that dominates modern analysis, demand effects are constrained to the “short run” of a few quarters to perhaps two or three years. Over longer horizons the standard consensus asserts that the supply side rules, a principle labeled by Blanchard (2018) as the “independence hypothesis” and Sim (2022, page 1), writes “has been at the center of monetary economics and the majority of Keynesian economists has accepted the concept” ‘as an “unquestionable axiom.” In various incarnations, this perspective is known as the neoclassical synthesis, new consensus macro, or new Keynesian theory. Standard textbooks enshrine the standard consensus, and it dominates most macro policy analysis.

In this paper, I present a perspective on demand-led growth that unifies and interprets results from a long personal research program that challenges the dominant view.¹ The results from this work argue that the dynamics of demand matter for the path of aggregate output and employment beyond the short run. Indeed, this article proposes that demand is the most important factor determining the growth path of modern market economies. This result is broadly consistent with decades of research in post-Keynesian macroeconomics including theoretical and empirical work grounded in the Kaleckian and supermultiplier growth models.² Some recent mainstream research also moves in this direction, especially since the Great Recession.³

This article identifies three foundational principles necessary and sufficient for demand-led growth. First, firms produce what they expect to sell: actual and expected demand drives production, employment, and capacity creation for most firms most of the time. Second, neither nominal wage and price adjustment nor enlightened “new consensus” monetary policy reliably ensures convergence to full employment, a conclusion that undercuts the view that demand dynamics can be relegated to the short run of nominal wage and price stickiness. Unlike most recent results in the mainstream literature that propose demand matters beyond the short run, this

¹ Citations appear later in this article. For a presentation of this research history see Fazzari (2026).

² For a comprehensive treatment of this research, see the *Handbook of Alternative Theories of Economic Growth*, 2nd Edition (Setterfield, 2026).

³ Examples include DeLong and Summers (2012), Benigno and Fornaro (2017), Furlanetto et al. (2025), Antolin-Diaz and Surico (2025) and Jordà et al. (2024). Earlier research on hysteresis effects of recessions that extend beyond the short run includes Blanchard and Summers (1986) and Ball (1999).

second principle does not require an interest rate pinned at the zero lower bound. Third, demand conditions that determine resource utilization spill over to the supply side. Strong demand at a point in time raises the growth of both labor productivity and the labor force; weak demand reduces supply growth, effects often associated the concept of hysteresis. Through this critical channel, demand leads supply, reversing the direction of causation in standard consensus macro models.

Building on these principles, two key implications become apparent. First, there is no single equilibrium “natural” rate of unemployment defined solely by the supply side, independent of demand dynamics. When supply adjusts to accommodate demand growth, unemployment can settle indefinitely at a level higher than consistent with full employment. Second, there is no supply-determined, long-run rate of growth independent of demand dynamics. Blanchard’s “independence hypothesis” fails and there is no endogenous mechanism for economies to converge to their maximum potential growth path. Furthermore, should policy or robust private demand manage to achieve full resource utilization at some point in time, any persistent negative demand shock will pull supply down with it, leading to under-utilization of an economy’s resources.

In the following sections, this essay presents the theoretical case for each of the three foundational principles and explains how they come together to present a unified perspective on demand-led growth. In addition, I summarize some historical and statistical evidence related to the theoretical principles. Effective empirical analysis not only tests the implications of the theory, but it also provides credibility needed to engage with the standard consensus that the supply side alone rules the long run. The ability to empirically validate the unified theory also paves the way for more robust and targeted policy to support sustainable prosperity and address contemporary challenges such as green transition and demographic shifts.

Principle 1: Demand Drives Production and Employment

In a market economy, firms obviously produce for sale. It therefore seems equally obvious that production will follow expected sales, determined primarily by actual sales. Yet mainstream “microfoundation” theories of firm-level production and employment choices mostly suppress reference to shifting demand as the proximate determinate of production. Why?

Neoclassical microfoundations are grounded in formal optimization problems based on smooth specifications of production technology. First-order conditions for profit maximization equate marginal revenue with marginal cost. Any consideration of how demand affects production decisions is buried in marginal revenue. The baseline model is often perfect competition; firms can sell any quantity of output at the market price. Marginal revenue equals price and individual firms face no quantity constraints on sales. In addition, marginal costs are typically assumed to rise smoothly so that the profit maximization problem has an interior solution. Any effects of demand on production are entirely mediated through the market price. This baseline model aligns with the focus in neoclassical theory on prices as the key mechanism of economic coordination. This model may apply, at least approximately, to a relatively small share of sectors consisting of small firms with a negligible share of production relative to the total market and producing entirely undifferentiated products, agricultural commodities for example.

In reality, however, almost all firms set prices rather than take market prices as given, even in highly competitive sectors.⁴ Pricing decisions certainly respond to the elasticity of demand and behavior of competitors. These factors can be integrated into the theoretical construct of marginal revenue and conventional profit maximization, for example monopolistic competition as in Fazzari et al. (1998). But a more practical and realistic way to understand firms' pricing is with a price mark-up over costs. While marginal costs must rise with output for profit maximization to have a determinate solution under perfect competition, there is no such requirement when firms face downward sloping demand curves. Indeed, many authors assume, especially as a simplifying benchmark case, that marginal costs are constant for normal variation in output. Justifying this assumption, firms typically operate with excess capacity and therefore usually do not bump up against capacity constraints that would raise marginal costs.⁵

If marginal costs are constant and firms face a constant price elasticity of demand, the profit-maximizing firm mark-up of price over cost is also independent of output. Prices are constant, for given input costs, not because of some kind of structural nominal rigidity but

⁴ The regional market for gasoline provides a useful example. There are many small firms producing a mostly undifferentiated product. But firms nonetheless set prices and prices vary somewhat across firms.

⁵ See Lavoie (2014, sections 3.5 and 3.6) for an extensive discussion of the post-Keynesian theory of the firm along with references to other theoretical and empirical research that support constant marginal costs and mark-up pricing.

because firms choose prices largely independent of the level of production. Expanding output is profitable if higher output can be sold. In this environment, demand determines production, and ultimately employment, while prices depend on costs that are mostly independent of demand. This perspective centers demand as the proximate driver of output and employment.

This simple model of production does not require unrealistically smooth production functions; it can be consistently applied with Leontief / Sraffian technologies. It contrasts with popular mainstream DSGE models that obscure the basic link between demand, production, and employment with expectations of future marginal costs, menu costs of price setting, representative agents producing both intermediate and Dixit-Stiglitz aggregated final goods, etc., all concepts that largely reside in minds of PhD economists rather than real-world businesses making real production decisions.

In a nutshell, the first part of the unified demand-led growth model is: firms produce what they expect to sell, and firms set prices as a markup over costs.⁶ Demand matters for production decisions at the firm level. This specification of firm behavior is simple, but realistic. On its own, however, it does not generate demand-led growth. Monopolistic competition affects the level of output consistent with fully employed resources. But the reduction of output relative to a perfectly competitive benchmark arises from market power, not any insufficiency of aggregate demand. To push the argument forward, one needs to embed firm behavior in a macroeconomic framework leading to the second principle.

Principle 2: Demand Matters Beyond the Short Run

Demand drives production and employment at the firm level, but what then drives the path of aggregate demand? Specifically, is there some structural macroeconomic channel that assures adequate aggregate spending to create full employment over some time horizon?

Neoclassical Macro: Sticky Prices in the Short Run—Supply Rules the Long Run

Standard consensus macroeconomics provides a simple answer to this fundamental question. While aggregate demand dynamics may be riddled with “shocks,” mainstream textbook macro proposes endogenous dynamics following a shock put demand on a stable path back to

⁶ In the service sector, firms typically produce what they actually sell; sales of a service is production of a service. Of course, the capacity of services that could be sold at any point in time depends on expectations about what will actually be sold.

some definition of “potential” output. Real potential output, denoted by Y^* in what follows, is understood in the standard consensus model as determined by “tastes and technology,” along with an economy’s endowment of resources. “Tastes” drive labor supply and saving decisions. Technology maps inputs into outputs, the smooth neoclassical production function. These concepts constitute the neoclassical supply side. It evolves independently of demand, and it anchors the neoclassical long run. This perspective grounds the seminal Solow growth model. Most of more recent endogenous growth research expands on the economic factors that govern technological advancement, but the engine of growth remains exclusively on the supply side with no role for the dynamics of aggregate demand. As, for example, in the Nobel-Prize-worthy model of Aghion and Howitt (1992).

Standard consensus macro theory claims price and wage adjustment constitutes the endogenous mechanism pushing aggregate demand to Y^* . At one level, this claim seems intuitive to any beginning economics student. Price adjustment clears markets, equating supply and demand. Going a little deeper, the intermediate micro student learns demand curves slope downward due to substitution and income effects. If apples are in excess supply, the price of apples falls relative to oranges, encouraging substitution of apples for oranges. In addition, if folks were already consuming apples and the price of apples declines, real purchasing power rises and some of that higher purchasing power increases demand for apples (assuming apples are a normal good). In the face of excess supply, the general result seems to be that lower prices induce more demand until markets clear. However, a deeper look immediately reveals problems with extending simple microeconomic logic to the aggregate economy. If the price of everything declines, there is nothing to substitute toward. If all prices fall, nominal incomes necessarily fall, killing any aggregate income effect. We need different theory if aggregate price and wage flexibility is to solve problems of aggregate excess supply and the associated unemployment.

Such theories exist, perhaps occupying a page or two out of hundreds in most macro textbooks. There are several possible channels, but the dominant claim is that lower prices raise the real money supply, or, equivalently, lower prices reduce the nominal demand for money. The price of money, the interest rate, declines. A lower interest rate induces more aggregate spending. Price, wage, and interest rate adjustment proceeds until markets clear, until aggregate demand

equals Y^* , equivalent to full employment in the labor market.⁷ This process, while rather obscure and indirect, supports the basic neoclassical principle that prices clear markets, especially that wages clear labor markets, when they freely adjust. The standard consensus conclusion follows that insufficient aggregate demand or excess aggregate supply persists only if wages and prices are “sticky,” slow to adjust to negative demand shocks. From this perspective, Keynesian problems of insufficient aggregate demand are confined to the short run of slow nominal adjustment; the supply side rules the long run. Paul Samuelson defined this outcome as the “neoclassical synthesis:” a Keynesian demand-driven macroeconomics in the short run of nominal stickiness, but “classical” long-run supply-driven macroeconomics in the long run of flexible wages and prices.⁸

Most mainstream analysis of this crucial theoretical claim stops here. The story suffices as a foundation for everything from the textbook downward sloping aggregate demand curve to highly technical DSGE models with their menu cost or staggered contract microfoundations for sticky prices. This analysis does demonstrate that nominal stickiness in some form is *sufficient* to explain Keynesian effects of aggregate demand on real output and employment and decades of empirical research identify sources of price or wage rigidities.⁹ But is nominal stickiness *necessary* as a foundation for Keynesian aggregate demand effects? I argue the answer is a strong no.

In the history of macroeconomic thought, leading economists including, Keynes, Fisher, Minsky, and Tobin question whether price adjustment will restore Y^* and full employment. Do aggregate demand curves really have a negative slope? Much of the heterodox view of aggregate price flexibility emphasizes destructive financial consequences of deflation, generalized more

⁷ An alternative “wealth effect” from lower prices raises the purchasing power of nominal assets. However, a net effect arises only for nominal “outside” assets that are not offset by private liabilities. Such assets constitute a tiny share of aggregate wealth, so this effect is of little practical relevance. More plausibly, lower prices in one country relative to the rest of the world may improve terms of trade and raise exports. However, this channel raises demand in one place at the cost of a decline in demand elsewhere.

⁸ Blanchard (1991) states that the term “neoclassical synthesis” comes from Samuelson’s popular *Economics* textbook in 1955. Blanchard (page 505) summarizes the synthesis as claiming “[b]ecause prices and wages eventually adjusted to clear markets, and because policy could avoid prolonged disequilibrium anyway, macroeconomic research could progress along two separate lines. One could study long-run movements in output, employment and capital, ignoring business cycle fluctuations as epiphenomena along the path and using the standard tools of equilibrium analysis.”

⁹ Skott (2023, section 10.2) provides a useful survey of empirical price stickiness research along with an effective critique concluding (p. 262) “the evidence shows that price adjustments are frequent and significant.”

recently to disinflation.¹⁰ Falling prices reduce the purchasing power of debtors while increasing creditor wealth. This redistribution likely lowers aggregate demand. Lower prices and wages also make it more difficult to service nominal debt reducing both the demand for and supply of credit to finance spending. Also, if falling prices lead to an expectation that prices will fall further going forward, it makes sense to defer spending. These channels *go the wrong direction*, falling prices can reduce aggregate demand and greater price flexibility can be destabilizing.

Considering the central role of price adjustment in the mainstream macro narrative, one might expect extensive empirical research on how the speed of price adjustment affects the dynamics of aggregate demand. But this is not the case. In contrast to studies that support the existence of slow nominal adjustment, there is virtually no formal empirical work on whether price and wage adjustment stabilizes aggregate demand.¹¹ Perhaps the view that Keynesian, macro results arise only if prices are sticky is so thoroughly drummed into mainstream thinking that it does not occur to researchers to test this central hypothesis. But this interpretation leads to a paradox: if it is widely accepted in standard consensus macro that the failure of prices to fully adjust downward when demand falls short of Y^* is the only reason for real effects of demand shocks, why does there seem also to be near consensus among prominent practical economists that deflation must be strongly avoided and optimal inflation targets are positive?¹² I propose two possible answers. First, there is just an inconsistency between theory and practice. Policy makers and those that comment about policy recognize that deflation risks financial instability and is destabilizing, but they do not translate the implications of this view to the deeply rooted mainstream theoretical equivalence between Keynesian macroeconomics and sticky prices. Second, theory notwithstanding, standard consensus macro in its “New Keynesian” clothes has

¹⁰ See Delong and Summers (1986) and Caskey and Fazzari (1987). Summa (2022, page 5) also attributes this view to Abba Lerner despite the grounding of his thought in neoclassical general equilibrium theory writing “Lerner never abandoned the neoclassical view of the determination of full employment output, although he was skeptical about the existence of automatic market forces capable to make aggregate spending equal to this position.”

¹¹ Delong and Summers (1986) find greater price flexibility is destabilizing for almost all parameter values in a calibrated model focused on inflation expectations. In Caskey and Fazzari (1992) we empirically calibrate a small dynamic macro model with both stabilizing and destabilizing channels for price flexibility modeled as the responsiveness of inflation to output gaps. We find that greater price flexibility is modestly destabilizing. But the main conclusion is that aggregate demand dynamics seem largely independent of the speed of price adjustment. That is, with a static interpretation, the aggregate demand curve is approximately vertical.

¹² For example, see Bernanke (2002).

abandoned wage and price flexibility as the cure for weak aggregate demand. Instead, attention has shifted to monetary policy, which I assess in what follows.

New Consensus Monetary Policy

In the second decade of the 21st century, any reading of mainstream academic macroeconomics, and any reading of middle-of-the-road news coverage of macroeconomics, asserts that economies rely on wise monetary policy, not nominal adjustment, to push aggregate demand back to the potential output path assumed to rule the long run. This is the “new consensus” in macroeconomics with origins in the years after the early 1980s Paul Volcker experiment with monetarism and became deeply integrated into conventional macroeconomic wisdom over the next two decades. The Taylor Rule version proposes that unemployment above a supply-determined “natural rate” or “NAIRU” should, other things equal, trigger the central bank to lower interest rates. Then demand rises (through the New Keynesian “IS” equation) until potential output and the natural unemployment rate are restored. The more nuanced inflation targeting version relies on the “New Keynesian Phillips Curve” equation which predicts that unemployment above the natural rate or an output gap below the potential level will cause inflation to fall below target which, again, triggers policy to lower interest rates to induce higher demand causing unemployment to fall while inflation rises back to its target level.

This policy framework resembles important aspects of the older narrative that falling wages and prices raise the real money supply. In both cases, the objective is to push the interest rate to a level that aligns aggregate demand with Y^* and full employment, that is, to realize the “natural” or “neutral” interest rate. But, as described earlier, reaching this objective through deflation creates destabilizing risks, risks that wise monetary policy avoids.¹³ This new consensus paradigm substitutes policy intervention grounded in bureaucratic expertise for the natural, endogenous process of price adjustment as the key macroeconomic stabilizing mechanism. As such, it may not be comfortable for those wedded to full free-market dogma. But it constitutes a practical approach as well as opportunities for armies of both academic and central bank economists to calibrate models of optimal monetary policy.¹⁴

¹³ One way to interpret this point is that if the objective is to raise the ratio of the money supply to the price level, it is quicker and less risky to raise the money supply with policy than to wait for prices to fall.

¹⁴ For example, Bullard and DiCecio (2025) and numerous references cited there.

The new consensus restores the main implication of the old neoclassical synthesis that Keynesian problems of weak demand fade away in the long run and therefore aggregate demand dynamics can be ignored in growth theory while long-run policy need focus on the supply side only. Simon Wren-Lewis (quoted in Mason and Jayadev 2013, p. 106) writes “if real interest rates are at their natural level, we do not need to think about demand when calculating output. In most cases, it is the job of monetary policy to try and get the economy back to this natural real interest rate.”

Can we rely on monetary policy to play this critical role effectively? My answer is ambiguous, one cannot rule out the possibility that interest rate adjustment, in principle, may push demand to a level consistent with Y^* . But I argue that monetary policy, even when guided by wise technocrats and informed by new consensus research, does not reliably eliminate Keynesian demand effects beyond the short run for four primary reasons.

First, the largest component of aggregate demand, by far, is personal consumption. There is virtually no evidence that personal consumption expenditure responds much to changing interest rates in any substantial way.¹⁵ In an interesting study Sinha and Smolyansky (2022) explore the effect on output and inflation of the large rise in interest rates associated with the “taper tantrum,” the unanticipated winding down of a quantitative easing policy in 2013. The authors argue this “natural experiment” generated a remarkably large interest rate shock, raising the yield on 10-year U.S. treasury bonds by more than 100 basis points, but the authors conclude (page 2) this shock “did not have any observable negative effect on the aggregate economy,” including no effect on personal consumption expenditures.

Second, typically economists rely on the interest elasticity of investment as a more effective channel for the transmission of monetary policy to demand. However, empirical evidence for a strong response of business fixed investment to interest rates and the cost of

¹⁵ There may be a modest effect of interest rates on the demand for consumer durables. Vehicle sales are often credit financed. Copeland et al. (2019, figure 3) estimate that a 100 basis point reduction in the real interest rate temporarily raises new car unit sales by approximately 0.75% over 7 months. Annualizing this figure and applying it to average unit sales of light vehicle of 18 million (2021 to 2024) and 2025 average cost per vehicle of \$50,000 implies that a one percentage point drop in the real interest rate would raise the dollar value of auto sales by 0.013% of GDP. Nominal (not real) new car loan rates fell by just under 400 basis points in the Great Recession. Other things equal, this massive drop in rates could raise new car demand by 0.05 percent of GDP, a trivial amount. Of course, other things were not equal. Unit sales of light vehicles *fell* by almost 40 percent in the Great Recession and did not recover the pre-recession peak for 10 years despite historically low interest rates.

capital is limited, at best.¹⁶ Montier (2015, exhibit 7) presents striking evidence that firms' nominal "hurdle rates" for capital expenditure changed hardly at all between 1985 and 2013 despite a decline in nominal BBB bond rates and 10-year Treasury rates of between 900 and 1000 basis points. Furthermore, nonresidential business investment has rarely exceeded ten percent of GDP since the middle 1980s, requiring a very large response of investment to interest rates if business investment is the primary channel through which monetary policy closes even a moderate aggregate demand gap when exist. A deeper dive into theory magnifies skepticism. Neoclassical microfoundations imply it is the capital *stock* that depends on the level of interest rates. Investment is the change in the capital stock. A lower interest rate might nudge net investment higher during a transition to a larger capital stock, but this effect is temporary. Finally, it will be especially difficult to encourage investment during periods of overall economic weakness when capacity utilization is already low (see Palley 2019). Blanchard (1986, page 153) provides a useful, if somewhat provocative summary: for interest rates to "appear at all in the investment equation, one has to display more than the usual amount of econometric ingenuity, resorting most of the time to choosing a specification that simply forces the effect to be there."

Third, the best hope for monetary policy to engineer full employment works through residential investment. Causal evidence on the effect of monetary policy on residential construction is difficult to obtain due to endogenous response of policy, interest rates, and home building to the business cycle. That said, interest rates do seem to play an important role for both the demand and supply of new homes. Nonetheless, there are multiple reasons to question the ability of monetary policy to generate full employment and potential output through the residential investment channel. First, as table 1 shows, the connection between policy rates and mortgage rates has a positive correlation, but much less than a one-for-one quantitative relationship. Also, residential investment has rarely exceeded five percent of GDP since 1980, except for the unsustainable housing bubble that preceded the Great Recession. Indeed, after more than 15 years since the Great Recession, residential investment has been at levels

¹⁶ Research reaching back decades finds output/accelerator effects dominate the cost of capital as determinants of business investment (Chirinko, 1993). Some of my own research finds a statistically significant, but empirically small, effect of the user cost of capital on the level of the capital stock (Chirinko et al., 2011). Sinha and Smolyansky (2022) find no negative effect of the mid-2013 "taper tantrum" rise in long-term interest rates on business investment. In an interesting survey study of CEO investment plans, Sharpe and Suarez (2015) report that just eight percent of firms would raise investment following a 100 basis-point reduction in borrowing costs (16 percent if borrowing costs fell 200 basis points).

consistent with the trough of pre-2007 recessions aside from a few unusual years in the immediate aftermath of the COVID-19 pandemic. Because of the small residential investment share of aggregate demand, massive relative responses of home construction to policy rates would be necessary to fight even a modest recession.

Table 1
Fall in Monetary Policy Rates and Mortgage Rates in U.S. Recessions

Recession Period	Change in Federal Funds Interest Rate	Change in 30-Year Fixed Mortgage Rate	Ratio of Fall in Mortgage Rate to Federal Funds Rate
1981 to 1987	-6.4	-9.7	0.66
1989 to 1993	-3.0	6.2	0.49
2000 to 2003	-2.2	-5.1	0.43
2007 to 2009	-1.3	-4.9	0.27
2019 to 2021	-1.0	-2.1	0.47

Fourth, history shows that combatting a weak economy with aggressive interest rate cuts creates financial instability over longer periods of time. One can make the case that rate cuts in U.S. recessions since the early 1980s did stimulate residential construction. But this policy approach over a quarter century contributed to massive household borrowing, raised household financial fragility, and ultimately triggered the “Minsky Moment” leading to the most severe financial crisis and U.S. recession since the Great Depression.¹⁷

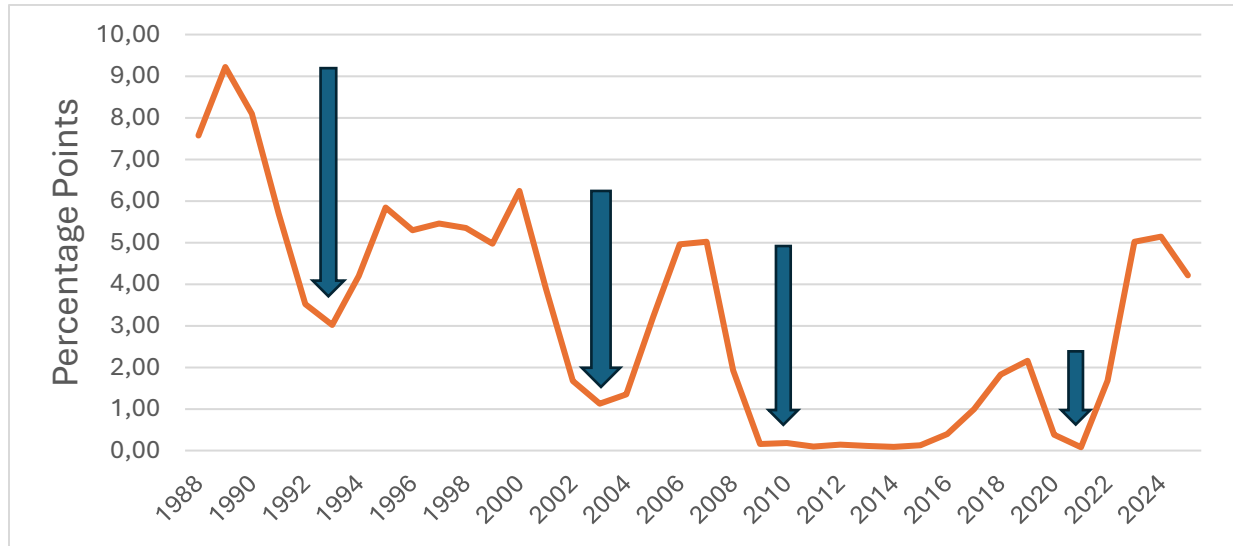
Considering the central role played by monetary policy in the new consensus macroeconomics that has dominated both theory and policy in recent decades, it is not surprising that extensive econometric research studies the effect of monetary policy on real activity. In contrast to the views expressed here, results from this research often show statistically and economically significant effects of monetary policy on output. A prominent example is the highly

¹⁷ See, among many others, Cynamon and Fazzari (2008 and 2016). Summers (2014) argues that the U.S. was able to maintain adequate aggregate demand growth in the decades prior to the Great Recession only through the creation of financial “bubbles,” bubbles that must eventually burst.

cited Romer and Romer (2004) paper with estimates that a one percentage point change in the federal funds rate leads to a four percentage point change in industrial production two years later. However, Ramey (2016, section 3.6) questions the ability of empirical time-series studies to identify the effect of monetary shocks on output and concludes that the best evidence we have comes from historical case studies. Wolf (2020, page 2) writes “a consensus on the real effects of monetary policy remains elusive.” Taking a broader view, historical evidence supports what might be called elasticity skepticism about the ability of monetary policy to fine tune aggregate demand to keep the economy operating close to Y^* . Figure 1 graphs the U.S. federal funds rate starting in 1988, after the excessive inflation of the late 1970s and early 1980s had largely abated. The downward arrows show the massive cuts in this policy rate in four recessions. The average cut in the policy rate for these four recessions was an enormous 458 basis points, which would have been even larger if the Fed had not been constrained by the near-zero lower bound in the third and fourth recessions.¹⁸ Despite the size of these cuts, their effectiveness is questionable, especially since 2000. The federal funds rate fell to one percent following the bursting of the technology bubble, but the recovery was labeled “jobless” and growth mediocre between 2002 and 2007 despite the inflation of a housing bubble. The collapse of the policy rate to the zero lower bound in the Great Recession was never able to return the economy to anywhere near its pre-recession trend (Coibion et al., 2018 among others) before the pandemic crisis. While this history does not directly challenge econometric results, it questions the power of monetary policy to guide the path of aggregate demand if enormous real-world changes in the policy rate lead to, at best, modest effects on output while also being partially responsible for causing the financial fragility that triggered the Great Recession (see also Galbraith, 2004, Montier, 2014 and Fazzari, 2024).

¹⁸ The 2019 to 2021 rate cut was also unusual because the source of the recession, rather than coming almost entirely from the demand side, occurred in response to the economic crisis induced by COVID-19 pandemic.

Figure 1
U.S. Federal Funds Interest Rate



Summarizing the second principle of the unified theory for demand-led growth, neither wage and price flexibility nor new consensus monetary policy provide reliable channels to restore demand to a completely supply-driven path of potential output. This principle is necessary for aggregate demand dynamics to impact the path of output and employment beyond the short run on nominal stickiness or monetary policy responses.

Principle 3: Demand Leads Supply

To understand growth beyond a horizon of three or four years, one cannot ignore the supply side.¹⁹ The supply of resources and the technology for transforming resources into socially useful output can constrain the extent to which demand can be met by production. For example, it seems implausible that the US would have been able to raise its real GDP by almost 25 percent in the 12 years between the peak of the business cycle before the Great Recession and the peak before the pandemic recession without some expansion of the supply side. However, the perspective presented here differs from the mainstream view of how the dynamics of demand and supply interact beyond the short run. Standard consensus macro usually assumes resources

¹⁹ Most post-Keynesian models of demand-led growth abstract from possible supply-side constraints. Models that recognize labor constraints are summarized in Skott (2026, section 4.3). Various approaches to integrate the supply side into demand-led growth rely on the Kaldor-Verdoorn effect analyzed theoretically and empirically by Hein and Tarassow (2009) and discussed recently in Fazzari and González (2025, section 3.3). See Dutt (2006), Setterfield (2011), Palley (2019), Nah and Lavoie (2019), Allain (2021), and Gallo and Zamparelli (2025) for related models and further references.

and technology evolve largely independently from demand dynamics. And through nominal adjustment or wise monetary policy, this supply-driven path pulls demand along with it: the supply side rules the long run. By contrast, principles one and two of the unified perspective imply the path of aggregate demand determines the path of output. There is no endogenous mechanism to necessarily push the demand path to fully employ the economy's resources.

One must recognize, however, that the theory needs to address two stylized facts about the relationship between the supply and demand sides over longer horizons. First, supply and demand do not seem to wander arbitrarily far from each other. Second, for demand to determine significant and sustainable growth in output over horizons beyond a few years, supply must also grow. Tautologically, productive capacity is necessary for production to occur. Therefore, for aggregate demand dynamics to have an independent effect on the output path beyond the short run, demand must affect supply.

Principle three of the unified perspective identifies an endogenous connection of supply to the state of the economy's demand side. Simply put, strong demand creates a strong economy enhancing supply growth and vice-versa. This structural connection is motivated in a variety of complementary ways. A strong economy with a low unemployment rate draws in labor supply. Higher wages and lower job matching costs raise labor force participation and encourage immigration. More important for rising living standards, a strong economy raises labor productivity growth through financial channels (higher cash flow helps finance R&D), incentives for labor saving (tight labor markets encourage innovation to address labor scarcity), and learning by doing (dynamic increasing returns). Symmetrically, weak demand creates economic slack and reduces profitability, compromising supply growth. These effects flip mainstream thinking: instead of the supply side pulling the demand side along with it, demand leads supply.²⁰

A simple version of the models presented in Fazzari et al. (2020) and Fazzari and González (2025) illustrate how supply adjusts to accommodate demand. Formalizing the

²⁰ While most mainstream macro models abstract from these effects, a history of both theoretical and empirical research on hysteresis could be considered mainstream. Although these contributions do not usually receive much emphasis in practical analysis of growth dynamics or policy recommendations, they do suggest a bridge between orthodox and heterodox perspectives on demand-led growth. However, this approach usually invokes the concept of a "natural" or "NAIRU" rate of unemployment which this section criticizes. Ball and Onken (2022) and Stockhammer and Storn (2012) provide estimates and extensive citations to earlier research.

channels to connect supply growth to the strength of the economy, specify labor supply growth (g_t^{LS}) and labor productivity growth (g_t^{Prod}) as:

$$g_t^{LS} = \theta_0 - \theta_1 u_{t-1}$$

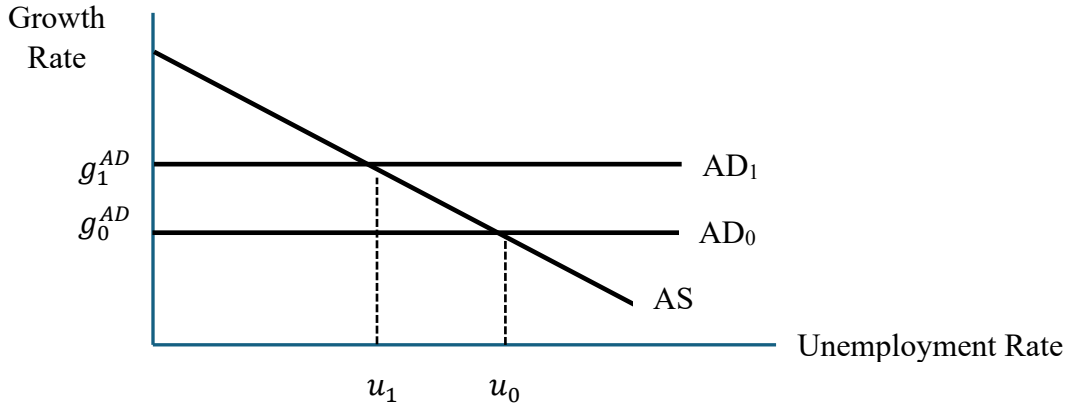
$$g_t^{Prod} = \phi_0 - \phi_1 u_{t-1}$$

The growth of aggregate supply (g_t^{AS}) is then:

$$g_t^{AS} = g_t^{LS} + g_t^{Prod} = (\theta_0 + \phi_0) - (\theta_1 + \phi_1)u_{t-1}$$

Again, simplifying and following the approach of supermultiplier models, suppose aggregate demand grows at an autonomous rate of g_t^{AD} .²¹ Figure 2 depicts the model graphically in growth rate-unemployment space. The AS curve slopes downward because higher unemployment leads to slower supply growth.

Figure 2 – Simple Model of Demand-Led Growth



The model generates an equilibrium unemployment rate that equates demand and supply growth. However, the growth of output is entirely demand led. Starting from a balanced growth path at u_0 , an acceleration of autonomous demand growth from g_0^{AD} to g_1^{AD} raises actual output growth (principle one: firms produce what they can sell). Initially, this positive shock to demand growth lowers the unemployment rate as higher production requires more labor input. But the lower unemployment rate stimulates labor supply and productivity growth through hysteresis effects ($\theta_1 + \phi_1$). Aggregate demand growth does not immediately rise from g_0^{AD} to g_1^{AD} .

²¹ This version of the unified perspective theory centers the supermultiplier approach to modeling demand-led growth. However, the three foundational principles apply in other analytical contexts, importantly including neo-Kaleckian models. See the effective and accessible summary of these models in Hein (2023) for further development and additional citations.

because the share of autonomous demand in aggregate demand is less than one, and it takes time for induced demand to catch up. As the multiplier process continues, aggregate demand growth continues to rise, again reducing unemployment and stimulating more supply growth. These dynamics eventually converge at g_1^{AD} and a lower equilibrium unemployment rate at u_1 . As Fazzari et al. (2020) emphasizes in its title supply growth “accommodates” demand growth.

This simple model has implications for macroeconomic theory that differ fundamentally from the mainstream neoclassical synthesis or “new consensus” models. Growth is entirely demand led, but any output gap converges to zero through the accommodation dynamics. There is no unique “natural” unemployment rate that is independent of demand dynamics. Both unemployment rates depicted in Figure 3 could be called “natural” since demand equals supply in both cases.

Furthermore, while the figure emphasizes the dynamics of growth, the same model implies that a permanent change in the *level* of aggregate demand results in a permanent change in the level of output *without a change in the equilibrium unemployment rate*. The adjustment dynamics are similar: an increase in the level of aggregate demand lowers the unemployment rate below the equilibrium level temporarily, inducing an accommodating supply response until supply catches up to the higher level of demand. If the shock to the level of aggregate demand is permanent, both actual and potential output will be on a permanently higher path.

The simple model also explains the possibility of technological unemployment. Suppose the economy receives a positive technology shock, modeled here as an increase in the intercept term in the labor productivity growth equation (ϕ_0). This shock shifts the aggregate supply curve in figure 3 upward, raising the long-run equilibrium unemployment rate. Intuitively, the ability of the economy to produce at a higher growth rate does not result in higher actual growth without some additional intervention to assure faster demand growth so that additional output can be sold. Principle two implies that nominal adjustment will not do the job. If the supply shock is disinflationary with higher unemployment, monetary policy might respond. But for monetary policy alone to raise demand growth, interest rates would need to fall continuously implying a

march to the zero lower bound, perhaps a quick march if the interest elasticity of demand is low, as analyzed in Fazzari (2024).²²

These results imply the dynamics of aggregate demand drive the economy beyond the short run. However, these results do not imply that either the growth or level of output can be arbitrarily high. In the simple model the maximum growth rate depends on the lower bound of the unemployment rate.²³ Ultimately, resource limits can constrain the level and growth of demand that can be accommodated by supply. But there is no reason to expect the level or growth rate of demand to endogenously yield full utilization of labor, an application of principle number two.²⁴ Furthermore, even if strong demand happens to deliver close to maximum employment and maximum growth, any negative demand shock will reduce current output, raise unemployment, and spillover to supply, leading the economy to operate below its true potential indefinitely.

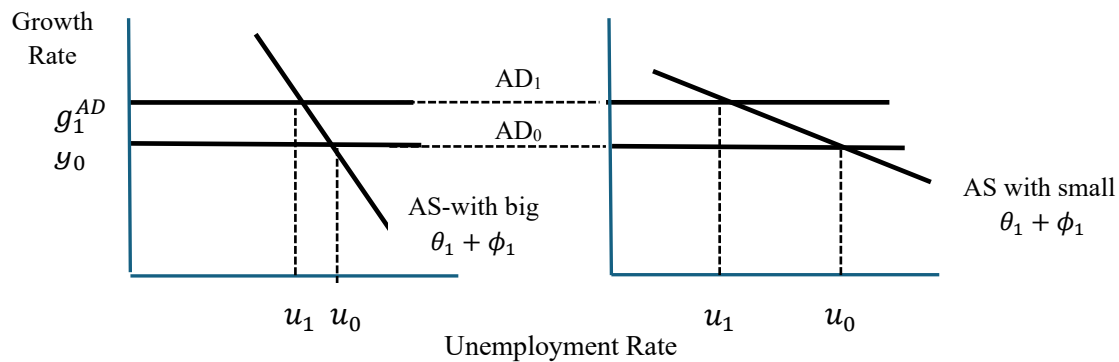
The practical relevance of this third principle, and therefore the practical relevance of this unified demand-led growth perspective, depends fundamentally on the strength of the channels linking demand to supply, that is, on the magnitude of the hysteresis effects, $\theta_1 + \phi_1$ in the simple formalization described earlier. Figure 3 illustrates this point in the simple model by asking how much will the unemployment rate need to change to accommodate a given demand growth shock? If the hysteresis effects are large, as in the left panel, the AS curve will be steep, and supply accommodates a given demand growth shock with a relatively small reduction in the unemployment rate. However, with weak hysteresis, the flat AD curve in the right panel of the figure implies a large change in unemployment would be necessary for supply to accommodate demand making it more likely an expansionary demand shock will face resource constraints.

²² This implication follows from the absence of any independent effect of technology shocks on output in the simple model. The possibility of additional channels between technology, supply, employment, and income distribution is a fruitful topic for future research along these lines.

²³ This lower bound surely exceeds zero, likely depending on matching frictions, labor bargaining power, and firm monopsony power. The effect of the state of the economy on inflation likely also plays a role. This topic deserves attention in future research.

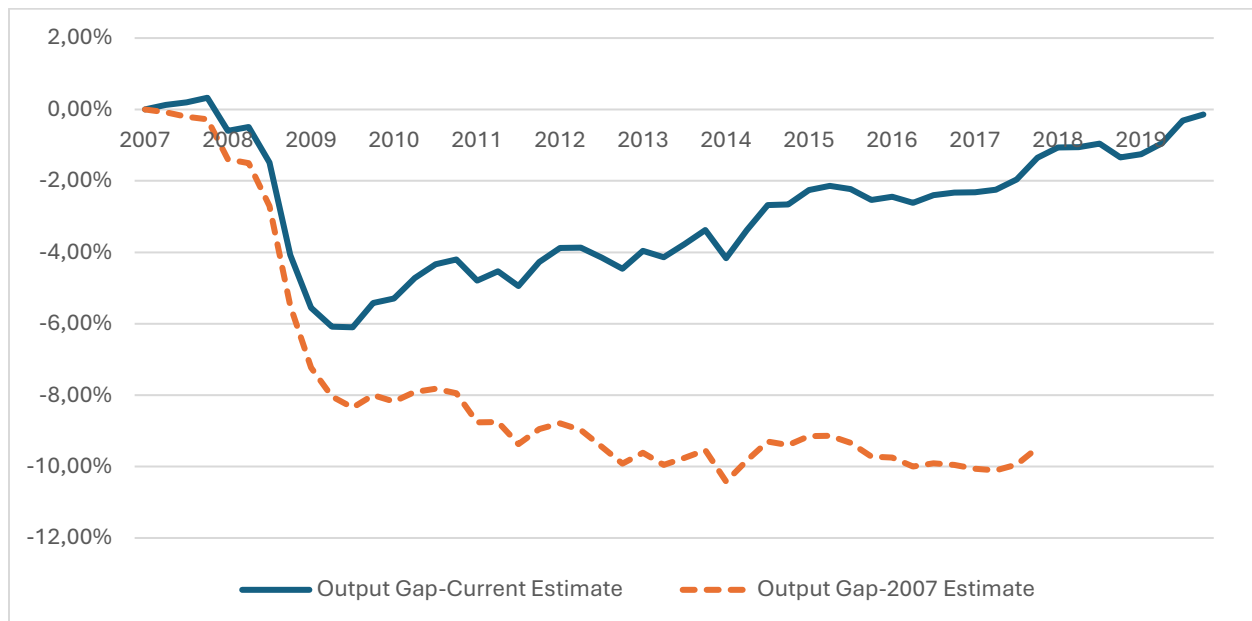
²⁴ In supermultiplier models, for example Fazzari et al. (2020), endogenous induced investment causes the capital-output ratio (alternatively capacity utilization) to converge to the target chosen by firms. Therefore, there is a tendency for convergence to full utilization of capacity in contrast to models in the tradition of Kalecki or “Oxford,” as summarized in Setterfield (2026) and Serrano et al. (2026). That said, the level of output associated with full capacity in long-run equilibrium depends on the dynamics of demand.

Figure 3 – Quantitative Importance of Hysteresis Effects



This result motivates the importance of evidence. The decade-plus following the U.S. Great Recession provides a compelling example of the third principle that the state of the economy, determined by the strength of aggregate demand, matters for the supply side. During this period, Summers (2014) resurrected Alvin Hansen’s “secular stagnation” hypothesis. In Figure 4, the solid line shows the Congressional Budget Office (CBO) estimate of the output gap during and following the Great Recession using current data (the percentage difference between the CBO estimate of potential real GDP and actual real GDP). Of course, the Great Recession was severe with a six percent output gap and a slow recovery. But by late 2019, on the eve of the pandemic recession, the recovery appears complete in the current data.

Figure 4 – Two Estimates of the US Output Gap in the Secular Stagnation Decade



But the dashed line presents a very different, and much worse, perspective. This output gap estimate uses the forward-looking CBO potential output estimate from early 2007, before the Great Recession (this series ends in 2017 because the CBO estimate, by law, projects ten years into the future). Using this estimate of potential output, the output gap created by the Great Recession is much worse, dropping by over 10 percent. And more striking, *there is no recovery at all*. Of course, the CBO economists are capable. In 2007 they fully understood the demographics of the US population, recognizing that the large baby-boom generation would begin to reach retirement age in the following decade. But they projected much stronger supply-side growth than their current estimates with the benefit of hindsight.²⁵

This evidence conforms well with all three principles of the unified perspective of demand-led growth. Principle one understands this collapse as the response to a massively negative demand shock. Principle two proposes that neither nominal adjustment nor monetary policy would not be up to the task of generating a quick recovery to contain the effect of weak demand to the “short run.” And, most important, this evidence confirms principle three: a long period of weak demand pulls the supply side down. In the face of an enormous downward shift in the path of aggregate demand after 2007, the supply side could no longer maintain the forward-looking trend estimated in 2007. Potential output was likely not ten percentage points above actual output by 2017 because the weak economy of the preceding decade led to a deterioration in both labor supply and labor productivity.

Fazzari and González (2025) complements this historical example with systematic econometric evidence supporting principle three. We estimate a dynamic supermultiplier model with accommodating supply that extends the simple graphical model in Figures 2 and 3. The hysteresis effects of the state of the economy on both labor supply and labor productivity are statistically significant and imply a strong quantitative response more in line with the left panel of Figure 3 than the right panel. The parameter point estimates imply the supply side can accommodate a one percentage point increase in the long-run growth rate with just an 0.7 percentage point reduction in the long-run unemployment rate. Even at the boundary of the 95th percentile confidence interval that implies the weakest accommodation effects, the decline in the

²⁵ Results are quite similar if one uses the 2017 CBO potential output estimates which show almost all of the output gap eliminated by 2017. See Coibion et al. (2018) for a detailed econometric analysis consistent with the interpretation here of the data in Figure 4.

unemployment rate necessary to support one percentage point higher long-run growth is less than one percentage point. About two thirds of this effect is due to higher labor productivity, but the labor supply effect is also economically and statistically significant. The empirical case is strong that demand leads supply.

This evidence illustrates two other important implications of the unified perspective. First, the output gap concept is largely uninformative about the real standard of living an economy can support. If supply accommodates demand, it is possible, indeed likely, that supply and demand come into approximate balance along a relatively weak demand path, even though higher demand could lead to both a higher level and a higher growth rate of output. Second, there is no unique “natural” or “neutral” rate of interest. This neutral-rate concept is premised on the belief that a balance between supply and demand is sufficient to assure an economy fully employs its resources. According to the demand-led growth perspective presented here, this belief is false, as discussed further in Fazzari (2024).

Concluding Comments: Sources of Growth—Limits on Growth

No one denies aggregate growth requires expansion of both supply and demand. Mainstream macro, consolidated in most popular undergraduate textbooks and used as the foundation for policy analysis grounded in the standard consensus model, asserts that supply dominates beyond the short run of nominal stickiness. The argument here is that three principles, none of which are particularly controversial on their own and all of which are broadly consistent with recent history, radically flip the mainstream on its head: demand is the primary engine of growth and supply accommodates. The main original contribution of this article is that these three principles provide a foundation, both necessary and sufficient, for the fast-growing body of research on demand-led growth beyond the short run in heterodox macroeconomics, to summarize very briefly:

1. Demand drives production and employment
2. Neither endogenous nominal adjustment nor wise monetary policy reliably restores aggregate demand to a level consistent with full employment.
3. Endogenous “hysteresis” responses of labor productivity and labor force growth to the state of the economy cause aggregate supply to accommodate the long-run path of aggregate demand

If one accepts the three principles then understanding the history of macroeconomic performance must focus first on analyzing the path of aggregate demand, not just for a few quarters but for longer periods, extending into decades. For example, persistent government austerity will likely lead to a slower growth path and higher than necessary unemployment, even though conventional output gap measures do not flash red or even yellow (Serrano and Braga, 2022; Summa, 2024). Or rising inequality that reduces the aggregate propensity to consume reduces the economy's output path in the long run (for example Cynamon and Fazzari, 2015).

This observation implies the need to go beyond simple models with exogenous growth determined by a uniform autonomous demand component, like the simple model summarized earlier here, as argued by Nikiforis (2018), Skott (2019), and Summa et al. (2026) among others. Multiple parts of aggregate demand, including consumption, investment, public spending, and international trade, have independent dynamics likely including both autonomous and induced components. These different pieces of demand surely grow at different rates that change over time. Perhaps there is some tendency for the growth of aggregate demand components to converge to each other, leading to a long-run center of gravity for output and productivity growth. But this observation leads to both theoretical and empirical questions that deserve further research. Along these lines, Palley (2019, page 339) write “the great unanswered question of super-multiplier theory is what determines the rate of growth of autonomous demand.” Morlin et al. (2022, page 1135) propose “the ultimate causes of growth in the supermultiplier [model] are not found in the intricacies of economic modeling but in the political and social determinants of autonomous demand components.”

Furthermore, empirical work needs to analyze the limits to demand-led growth. These limits arise from the ability of supply factors such as labor productivity and labor force growth to accommodate higher levels and growth rates of aggregate demand (formalized in the parameters ϕ_1 and θ_1 in the simple model presented here). They also depend on the pace of autonomous growth in both productivity and the labor force (ϕ_0 and θ_0) and what determines the minimum unemployment rate. As demonstrated earlier, standard consensus output gap or NAIRU concepts are largely uninformative as measures of economic potential when supply accommodates demand, demand that may be stagnant for structural behavioral reasons (such as inequality or financial fragility) or policy (such as fiscal austerity that emphasizes narrow “responsible”

finance to match tax revenue with spending rather than “functional” objectives such as maximum employment and rising standards of living.)

The main message of this article is to place the focus of macroeconomic analysis on the dynamics of aggregate demand as justified by three principles that unify a perspective on demand-led growth. In this unified theory, supply is not ignored. It can impose limits on the response of output and employment to demand, but most of the time supply follows, rather than leads, demand.²⁶

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²⁶ Themes in this brief conclusion are further developed with additional references in Fazzari (2026).

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