

Issue 36

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WHEN CETERIS ISN'T PARIBUS



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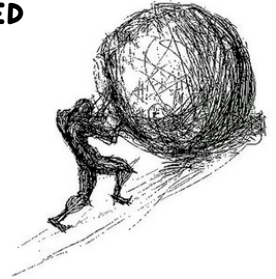
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Dear Reader,

Economists have a favourite way of taming complexity: assume the rest of the world stands still. *Ceteris paribus* - all else being equal - lets us trace one relationship at a time through the noise of economic reality. The trouble is that the world rarely obliges. In Issue 36 of *The Economic Tribune*, “When *Ceteris Isn’t Paribus*”, we turn our attention to what happens when everything moves at once.

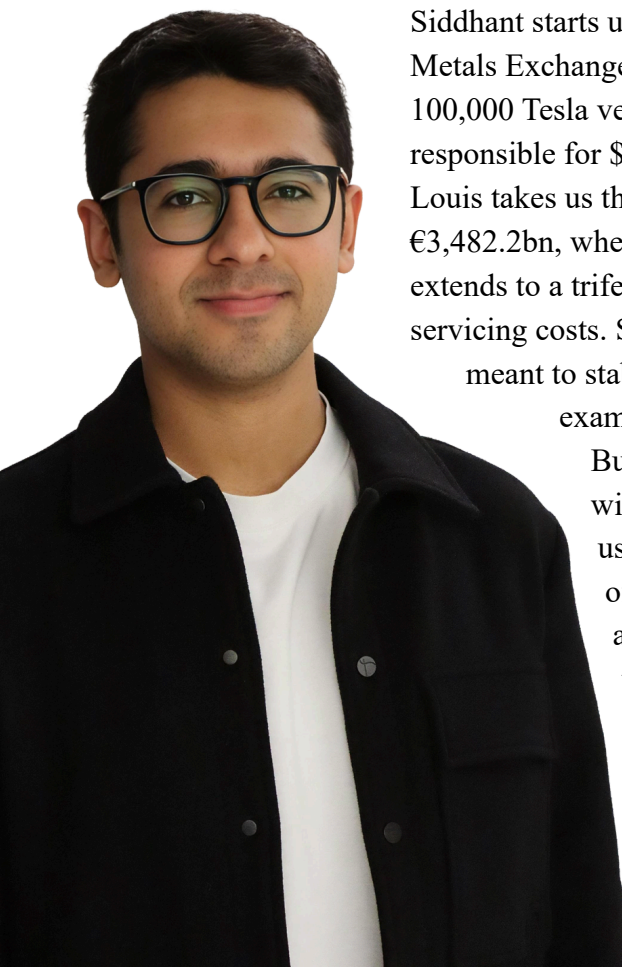
The tidy assumptions that underpin our models - constant technology, stable and unchanging institutions, rational actors making rational choices - are being stress-tested in real time. Supply chains that were supposed to self-correct haven't. Interest rate playbooks that worked for decades are producing unfamiliar outcomes. And the geopolitical backdrop that economists once filed under "external factors" has pushed its way to the center of the conversation.

Every piece in this issue begins where the textbook ends. This issue doesn't chase certainty. The pieces that follow are sharper than that; they are written for a moment when the variables are moving and the only responsible thing is to move with them.

As usual, Issue 36 is divided into three thematic sections, the first of which is “The Error Term”. Also called the residual or disturbance in econometrics, the error term is a humbling reminder to economists that the many regression models we come up with are unlikely to ever explain everything. If there is anything that we should be certain of, it is that the recent spike in black

swan events has increased the importance of this often-shunted variable. Siddhant starts us off by teleporting us to the trading floor of the London Metals Exchange. He takes us through how an announcement to acquire 100,000 Tesla vehicles triggered a near-complete wipeout of an institution responsible for \$85bn in daily traded value. If that figure isn't large enough, Louis takes us through France's crippling debt problem worth precisely €3,482.2bn, where gridlock isn't restricted to bipartisan conflicts; rather, it extends to a trifecta of high deficits; weak GDP growth; and rising debt-servicing costs. Shalin then asks what happens when even the institutions meant to stabilise such imbalances are themselves drawn into politics, examining the growing politicisation of central banking.

But the story of monetary authority cannot be understood without revisiting the ideas that once defined it. Sushant takes us back to the rise of monetarism, exploring how the promise of uncompromising control over the money supply once appeared to offer a solution to inflationary pressures, and why that promise proved harder to sustain in practice. The second section of this issue is "Pricing the World". The oldest lie ever told is that some things are priceless. It is also the most comforting one - and this section exists to complicate it. Not to be cold, but because the truth, when you find it, tends to be far more interesting.



Samuel opens the section with a question most people settle without ever really answering - is love a feeling, or a decision? It turns out that pooling your life with someone else is not just romantic. It is, under the right conditions, rationally optimal. Dhvani takes that idea of belonging somewhere and stretches it to its most uncomfortable extreme. Citizenship by investment schemes allow the wealthy to effectively purchase nationality - bypassing the messy, slow, human process of actually becoming part of a place. It is legal, it is growing, and it raises a question that is harder to answer than it sounds: what is a passport really for? Dimitrios then puts the congestion charge on trial. The premise is simple - price the roads, clear the traffic. The evidence, as he shows, is anything but. Shreyas then shifts the lens from the street to the labour market, and asks a question that has been hovering over every graduate cohort for the past few years: is artificial intelligence already showing up in the pay packets of the people who were supposed to benefit most from their education? Deniz closes the section by asking who steps in when the banks step back. Across sixteen years of UK data, the answer is less dramatic than you might expect - but far more structurally interesting.

As ironic as it may sound, Issue 36 concludes with “After the Fact”. Hindsight is not a weakness; rather, it is where the most honest analysis lives. The pieces in this section sit with what has already happened, and find that the aftermath tends to reveal more than the event itself ever did. Amba opens the section by challenging one of international economics' most comfortable assumptions - that trade deficits correct themselves. In a world where capital moves faster than cargo, the old mechanisms are breaking down in ways we are only beginning to understand. Matteo then asks a question that would have seemed radical a decade ago: is the petrodollar finished? As commodities inch away from dollar denomination, he traces what that shift means for the global order built around it. Saksham takes the EU-India trade deal and finds something uncomfortable beneath the headlines. What looks like economic partnership, he argues, is increasingly being driven by political necessity - and the difference matters more than either side is letting on. Janice continues with further introspection into EU trade policy. She turns to the EU's Carbon Border Adjustment Mechanism - a policy dressed in green but received, by much of the world, as a tariff in disguise. The risk of retaliation, she argues, is not hypothetical. Alisa finally closes the section by putting Japan's Nikkei 225 surge under the microscope. Using regression analysis, she asks the question markets rarely stop to answer: is this grounded in fundamentals, or are expectations doing all the heavy lifting?

Assumptions are the invisible architecture of every model, every forecast, every plan. This issue has been, in many ways, an exercise in pulling at them - and finding that the architecture is less stable than we thought. We hope the ideas within have made that instability feel less like a threat and more like an invitation. When *ceteris isn't paribus*, the interesting work begins.

Through uncertainty, with rigour;

Jai Vasandani

Director, 2025/26

THE RROR TERM



The Nickel Shock: How the Green Transition and Dangerous Bets Exposed Fragilities in Commodity Markets

by Siddhant Mathur

Mr Matthew Chamberlain was exhausted.

Perhaps it was from the wild yells of panicked traders on the floor, or the frantic market monitoring he was doing since waking up at 05:00. Weary-eyed, the CEO of the London Metal Exchange (LME) issued an announcement unprecedented in its 145-year history.

A shutdown.

At 8.15 am, he announced a complete shutdown of nickel trading, cancelling all trades of the previous day. In the span of just two days, the price of nickel had skyrocketed to \$101,000 from \$23,500 earlier in the year, with a \$30,000 increase in only 18 minutes. This drastic change brought significant losses for traders, a near complete wipe-out of the LME's Clearing House, and threatened the insolvency of the LME itself.

This is a story of evolving markets, big bets gone wrong, and near-total financial catastrophe.

Back to basics

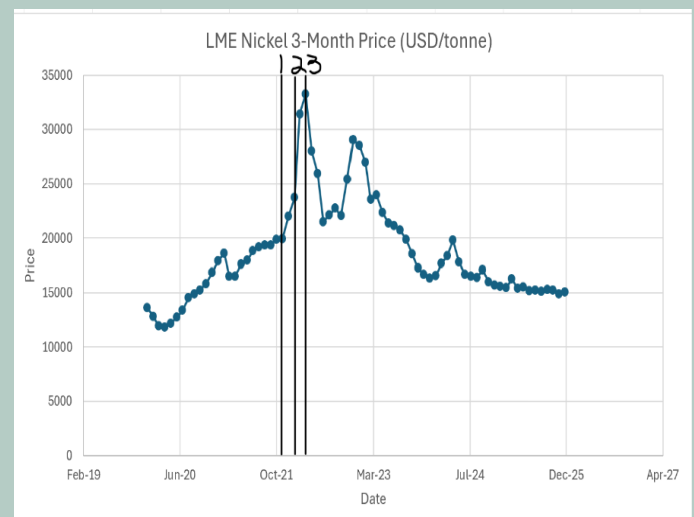
To understand this squeeze, it is crucial to understand the metals trade. Metals are traded like stocks on a trading floor, with exchanges like Britain's LME estimated to facilitate \$85bn in daily traded value - enough to give \$10,000 to roughly the entire population of New York City.

There are two key types of markets to understand. A spot market allows traders to buy or sell a commodity at its current price, profiting by going 'long' - buying now to sell later at a higher price - 'short selling' - borrowing and immediately selling to buy back cheaper if the price falls. A futures market involves contracts granting the right to trade a commodity at a locked-in price on a future date. For example, a \$5 contract might entitle a trader to sell nickel at today's price of \$20,000 in three months; if the price drops to \$10,000, they pocket \$9,995. A key advantage of

futures contracts is that if the market moves against you, you lose only the contract's nominal cost rather than the full spot market loss.

Setting the stage for collapse

Historically, nickel was used for 'hedging' - traders connected to large-scale nickel manufacturers would offset risk from other assets by purchasing nickel short futures, locking in a selling price before an expected price drop.



- 1: Hertz-Tesla Deal
- 2: Start of Russia-Ukraine War
- 3: March 2022 LME Nickel Crisis

However, demand for nickel has grown strongly in recent years due to the rapid growth of the electric vehicle (EV) market, with nickel serving as a key component in battery production. This is reflected in rising LME futures prices following Hertz's announcement to acquire 100,000 Tesla vehicles for a large EV rental fleet. Nickel is also widely used in stainless steel production, improving toughness, ductility and corrosion resistance. These factors have driven prices upward rather than downward, transforming nickel from a safe hedge into a strategic asset increasingly influenced by speculation.

‘Mr Big-Shot’: How Excess Risk Seeped Into The Nickel Market

Enter stage-left, Xiang Guangda.

Responding swiftly to Indonesia’s 2020 nickel export ban, Tsingshan Holdings’ billionaire CEO expanded his firm’s local manufacturing and refining facilities, capitalising on Indonesia’s rise to become the world’s largest nickel exporter with a 60% share of the global market. The substantial returns earned him the nickname “Mr Big-Shot” on the trading floor, with profits reinvested to grow his position further.

Anticipating a drop in nickel prices due to increased Indonesian production, Guangda short-sold nickel both through the LME and via private OTC contracts with banks like JP Morgan and Standard Chartered, concealing the true scale of his position from regulators. The banks, in turn, hedged their own exposure by betting against nickel on the LME, paradoxically amplifying market risk and piling further downward pressure on an already strained market.

As Russian troops crossed the Ukrainian border, the market went haywire.

The Crisis

When Russia invaded Ukraine, investors feared that Russian nickel supply would fall, driving prices up rather than down as Guangda and the banks had expected. This led to significant losses, since they now had to buy back nickel at a higher price than they had sold, or absorb losses from unwinding futures contracts. These losses were exacerbated by margin calls.

A margin call occurs when an investor who has borrowed money to fund a trade sees their position fall below the broker’s required margin threshold - for example, if a broker funds half of a \$5,000 short position with a 25% margin requirement, the investor must top up their account if the position’s value drops below \$1,250, or the broker will forcibly close the trade at a loss.



Widespread margin calls for both Tsingshan Holdings and the banks triggered a ‘death spiral’: investors unable to meet calls faced forced position closures, requiring them to buy back nickel and pushing prices higher still. This triggered further margin calls, and the cycle repeated. Prices spiralled out of control as investors panic-bought nickel, seeking to recover their losses.

When The Music Stopped: The LME Shutdown

The spiralling nickel market posed serious threats to the LME and broader financial system. As margin calls grew, 12 of the LME’s 45 Clearing House members faced the threat of default, risking a collapse of metals trading in London. The LME shut down nickel trading and cancelled all trades from the previous day, effectively winding back the clock to pre-crisis prices and voiding \$12bn in trades.

This did not come without controversy. The shutdown effectively bailed out Tsingshan Holdings and its banking partners, shielding them from serious consequences despite having concealed substantial risk through OTC contracts.

Though Guangda suffered losses in the billions, his Indonesian operations provided a means of recovery, raising broader concerns about market manipulation and the moral hazard of protecting reckless actors at the exchange’s expense.

The LME's decision to cancel trades led to lawsuits from Jane Street and Elliott Associates, claiming losses of \$15.34m and \$456.4m respectively, though the LME ultimately won both cases. Despite the legal victory, the exchange's reputation was severely damaged, with independent investigations by the Bank of England and FCA exposing significant weaknesses in its ability to handle market stress and management decision-making.

What can we learn?

The 2022 LME Nickel Crisis demonstrated how flawed market design and evolving dynamics can fuel instability, with Tsingshan Holdings exploiting OTC contracts to obscure risk while large banks underestimated their exposure as nickel transitioned from a hedging tool to a strategic asset. The LME and investors' failure to prepare for black swan events, despite prior warnings, meant that the Russian invasion of Ukraine sent nickel prices spiralling out of control, triggering massive losses and nearly bringing down the exchange entirely.

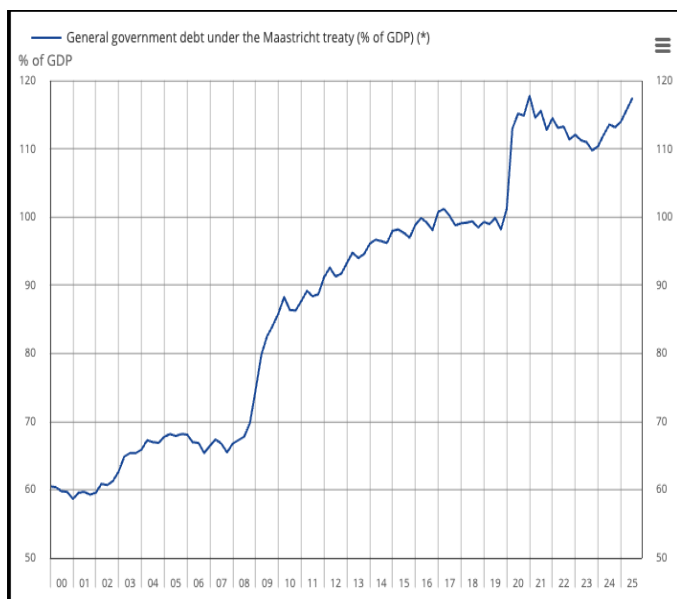


France's Debt Problem: Economic Strain Meets Political Deadlock

by Louis Fritsch

By the end of Q3 2025, France's public debt (the official general-government measure published by INSEE) stood at €3,482.2bn or 117.4% of GDP. The crisis stems from the collision of two forces: economic conditions that keep pushing debt higher (persistent budget deficits, weak growth and rising interest costs) and a political paralysis that repeatedly blocks the reforms needed to arrest it.

The graph below illustrates France's increasingly troubling debt trajectory. Since the early 2000s, the debt-to-GDP ratio has trended upward, with two pronounced jumps during the 2008-09 global financial crisis and the COVID-19 pandemic.



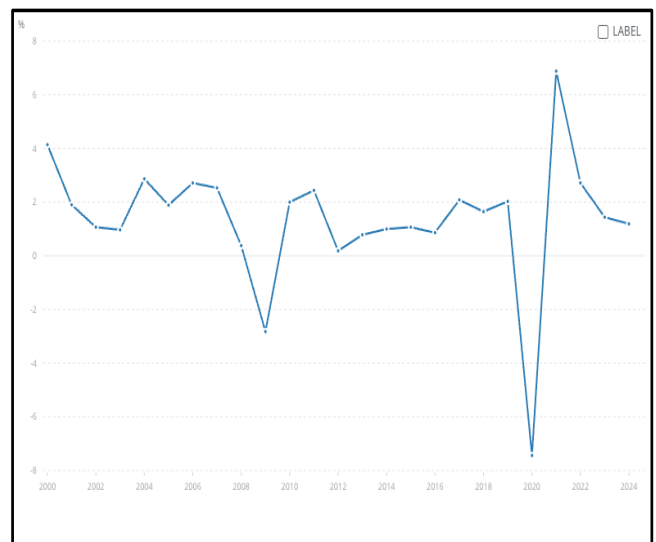
The blue line shows government debt as a percentage of GDP.

The question now is which economic factors are driving this trajectory.

First, deficits remain elevated: INSEE reports a general government deficit of 5.5% of GDP in 2023 and 5.8% in 2024. The deficit is largely driven by persistently high public expenditure, which sustains France's generous social security system. Government spending was 57.3% of GDP in 2024, and has averaged 54.11% of GDP from 1978 to 2024.

These figures sit well above the EU member-state average of 45.1% of GDP (as of December 2024).

Second, France is experiencing persistently weak GDP growth. This matters because when growth is weak, tax revenues tend to rise more slowly, while spending pressures often remain unchanged or increase. The result is a tendency for fiscal balances to deteriorate and for the deficit to widen. This trend is illustrated in the graph below, which draws on World Bank-compiled data to show France's weak GDP growth since the early 2000s.



The blue line shows GDP growth (in percent).

Third, France's debt-servicing costs are rising because higher interest rates and heightened fiscal concerns have increased the cost of borrowing. France's 10-year yield is currently 3.3%, around 56 basis points above Germany's. This France-Germany spread is commonly interpreted as a market gauge of investor confidence in France's public finances and perceived risk relative to the euro-area benchmark. In other words, French government debt is viewed as riskier than Germany's, so investors demand a higher yield as compensation for the additional fiscal and political risk they perceive. This creates a vicious cycle: as markets demand a higher premium to lend to France, the state's interest bill rises, fiscal

pressures intensify, and investor confidence can weaken further.

Taken together, the economic pressures described above are reinforcing one another: France continues to run a primary deficit, growth is too weak to offset debt accumulation, and higher borrowing costs are raising the interest burden on an already large debt stock. The combined effect is sustained upward pressure on the debt-to-GDP ratio.

The question now is which political factors are hampering efforts to address this economic crisis.

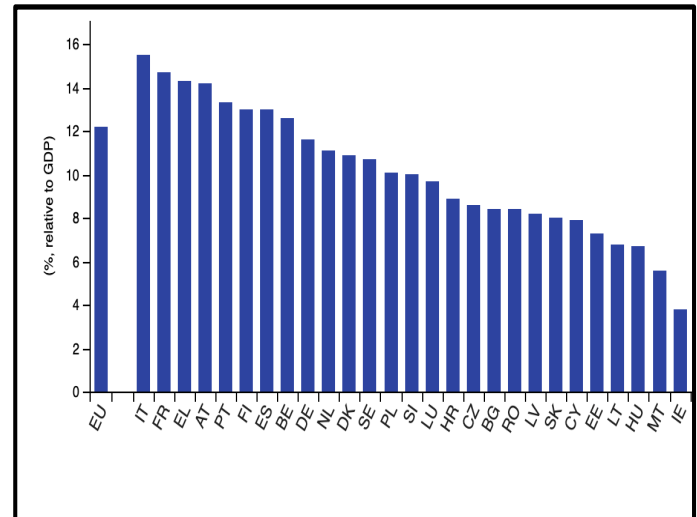
France's debt troubles are not just a question of fiscal arithmetic, they also reflect a governability problem that makes it difficult to enact and sustain the large-scale reforms needed to restore debt sustainability. The snap legislative elections triggered by President Macron's June 2024 dissolution of the National Assembly produced a tripolarised chamber, with three major blocs and no governing majority. Different ideologies drive sharply different visions for managing France's public finances across the New Popular Front, Ensemble and the National Rally.

The process that led to the 2026 budget bill's adoption demonstrates the extent of this paralysis. As 2026 began, France still had no adopted budget. After months of debate left the National Assembly deadlocked, Prime Minister Lecornu therefore invoked Article 49.3. This controversial (though constitutional) procedure allowed the bill to be deemed adopted without a parliamentary vote.

The focus now shifts to whether the 2026 budget bill delivers meaningful fiscal adjustment. It targets a modest deficit reduction from 5.4% of GDP in 2025 to 5.0% in 2026, but the adjustment is largely delivered through a limited package of near-term savings and revenue measures, rather than the kind of deep structural reforms that would lock in a sustained decline in the deficit.

On the one hand, with a deeply rooted attachment to public services and social benefits, sweeping austerity-style cuts to bring spending closer to EU norms are politically difficult to implement and sustain. On the other hand, as of 2024, France already has the EU's second-highest tax-to-GDP ratio

(45.3%, behind Denmark). This leaves limited scope to raise taxes further without potentially weighing on growth. Against this backdrop, President Macron has presented the 2023 pension reform as a central lever to contain expenditure growth over the medium term. France's pension bill is exceptionally large. In 2022, France spent 14.7% of GDP on pensions, well above the EU average of 12.2%.



Each blue bar shows pension spending as a share of GDP for a given EU member state.

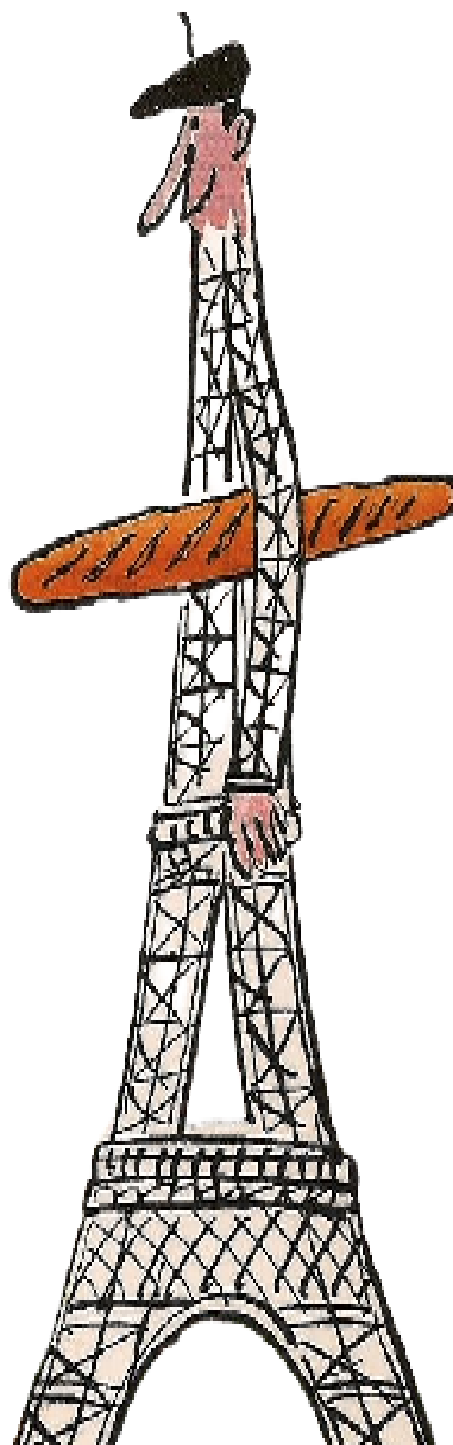
France's demographics will keep the pension arithmetic unfavourable: as the population ages, fewer workers will be supporting a growing number of retirees. The proposed 2023 reform was meant to respond to this ageing-driven squeeze by phasing the legal minimum retirement age up from 62 to 64, thereby extending working lives and bolstering contributions as the retiree population grows.

However, this structural reform (designed to address longer-term pressures) was not included in the 2026 budget bill. BBC reporting in October 2025 indicated that Socialist backing for the government's 2026 budget plans hinged on major concessions, including suspending Macron's 2023 pension reform. With a fragmented National Assembly and no governing majority, securing that support was key to reducing the risk of a no-confidence vote toppling the government.

This episode highlights France's broader governability and reform constraints, which limit the government's capacity to respond decisively to the debt problem. It is likely to unsettle investors, who place a premium on political stability and credible policy delivery.

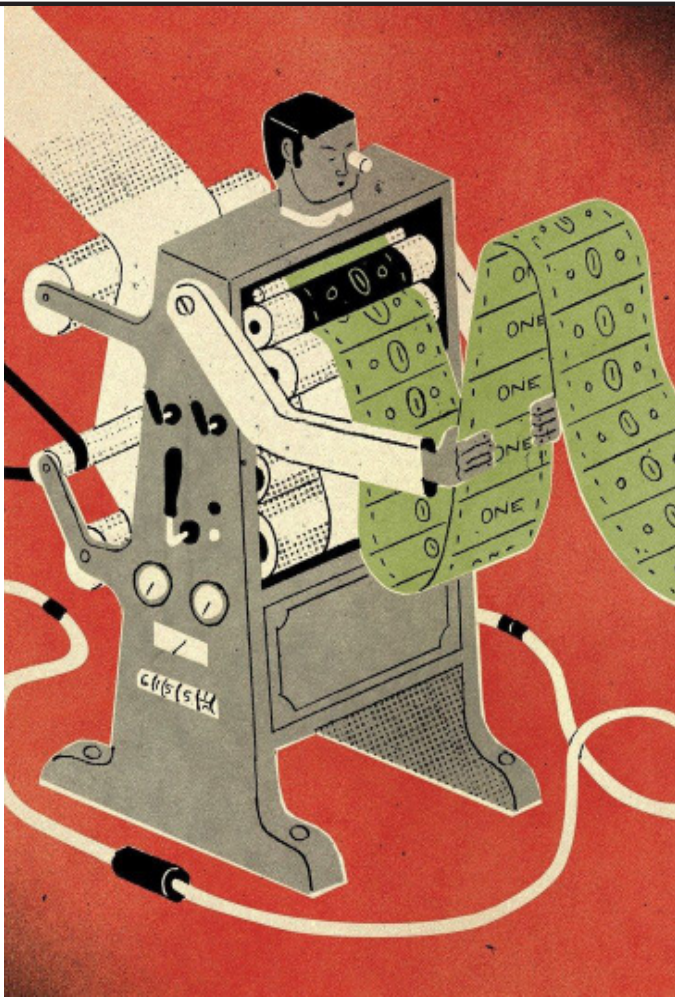
It is also worth noting that France is under growing pressure to increase defence spending amid a deteriorating security environment. Defence spending is set to rise by €6.7bn in 2026 compared with 2025. Macron said France's defence spending will be twice its 2017 level by 2027, to strengthen France in an "age of predators". This is another political force that requires increased government spending, making debt stabilisation harder.

To conclude, the fragmented National Assembly is making it difficult to pass major structural reforms. This leaves France reliant on incremental measures rather than a decisive adjustment. The next clear opportunity for a broader shift is likely to come with the 2027 presidential election and the subsequent legislative elections.



The Quiet Politicisation of Central Banking

by Shalin Bhansali



Designed to Be Independent

Central banks have always been viewed as bastions of economic stability, entrusted with the responsibility of managing inflation and safeguarding financial systems. They were deliberately designed to operate independently from elected governments, placing monetary policy in the hands of technocrats rather than politicians in order to insulate critical economic decisions from short-term electoral pressures. This separation was intended to ensure that interest rate decisions prioritised long-term price stability over politically influenced policies aimed at boosting short-term growth ahead of elections. However, recent trends suggest increasing political interference in central banking, raising concerns about the implications for economic policy and financial markets.

From Technocracy to Political Flashpoint

In recent years, monetary policy has shifted from a background technocratic function to a central political concern. After a long era of near-zero interest rates since the financial crisis, central banks were forced to tighten policy aggressively to combat post-pandemic inflation. These decisions had immediate and visible consequences: higher mortgage payments, rising business borrowing costs, and slower growth. As a result, politicians across advanced economies began publicly criticising central banks for prioritising low inflation over growth or employment. While formal legal independence often remains intact, informal political pressure, through public statements, legislative threats, or media campaigns, has become more explicit. Central banks still set rates, but they do so in an environment where political backlash is louder and more coordinated than at any point in recent decades.

The United States: Political Pressure in Plain Sight

A recent example of this politicisation can be observed in the United States where the dynamic between President Trump and Federal Reserve Chair Jerome Powell has become increasingly confrontational. Trump has repeatedly criticised Powell's leadership, arguing that the Federal Reserve has kept interest rates "too high" for too long. In several public interviews and campaign speeches, Trump accused the Fed of "hurting the American economy" by maintaining tight monetary policy and suggested that Powell's decisions were politically motivated. In a televised interview with Fox Business in late 2025, for instance, Trump stated that the Federal Reserve was "making a mistake" by failing to cut rates aggressively and claimed that lower interest rates would have supported investment and job creation. Such rhetoric illustrates a broader attempt to shape monetary policy through political pressure. Reports of a Department of Justice inquiry into Powell, which Powell himself described as a pretextual move, further raised concerns about whether political pressure

was being used to indirectly influence central bank decision-making.

Turkey: When Independence Collapses

Another example is the Turkish President Recep Tayyip Erdoğan who has a well-documented history of interfering with the Central Bank of the Republic of Turkey. Between 2019 and 2023, Erdoğan dismissed four central bank governors who opposed his unorthodox belief that high interest rates cause inflation. These interventions pushed the central bank to cut interest rates despite rising inflationary pressures. As a result, inflation surged, peaking at around 85 percent in late 2022, while the Turkish lira depreciated sharply. The weakening currency raised import costs, further fuelling inflation and intensifying the domestic cost-of-living crisis.

Why Now? The Structural Pressures Behind Politicisation

The growing politicisation of central banking is not simply the result of individual leaders or isolated events, but is driven by deeper structural forces. One key factor is the significant rise in government debt since the global financial crisis, further accelerated by pandemic-era spending, energy subsidies, and geopolitical shocks. In this environment, higher interest rates substantially increase the cost of servicing public debt, creating strong incentives for governments to favour looser monetary policy in order to manage fiscal pressures. Furthermore, electoral cycles reinforce these pressures, as politicians facing elections may favour expansionary monetary conditions to stimulate short-term economic activity, even if doing so risks fuelling inflation in the long run.

The Case for Political Oversight

There are legitimate arguments in favour of greater political scrutiny of central banks. Monetary policy decisions are not distribution-neutral: higher interest rates disproportionately affect borrowers, renters, and younger households, while benefiting savers. Critics argue that unelected officials should not have unchecked power to deliberately slow economic activity without democratic accountability. From this perspective, some degree of political oversight

can enhance legitimacy, ensure transparency, and align monetary policy with broader social objectives. Economically, this view suggests that rigid inflation targeting may overlook real-world welfare trade-offs, particularly during supply-driven shocks such as energy crises, where raising interest rates may do little to resolve the underlying cause of inflation but impose significant social costs.

Fiscal Dominance and the Credibility Problem

One of the most significant economic consequences of central bank politicisation is the risk of fiscal dominance. Fiscal dominance occurs when monetary policy becomes constrained by government borrowing needs, forcing central banks to consider the fiscal consequences of their actions. In such an environment, aggressively raising interest rates may threaten debt sustainability, financial stability, or even political cohesion. The risk is that inflation control becomes secondary to managing government financing costs. Economically, this weakens the credibility of monetary policy, as markets begin to doubt whether central banks will prioritise price stability when political costs rise.

More broadly, decreased credibility in central banks can lead to higher inflation expectations, as firms and households begin to anticipate that policymakers may delay tightening measures for political reasons. Financial markets may react negatively to such signals, resulting in increased volatility in bond and currency markets. In extreme cases, declining confidence in monetary policy can trigger capital outflows, weakening the domestic currency and further fuelling inflation through higher import costs. Delayed responses to inflationary pressures may therefore exacerbate price instability, increasing the long-term economic cost.

However, the economic risks of politicising central banks are substantial. Monetary policy relies heavily on credibility, the belief that central banks will act decisively to control inflation, even when doing so is politically unpopular. If markets suspect political interference, inflation expectations may become unanchored, leading to higher long-term borrowing costs, currency volatility, and weaker investment. Empirical evidence consistently suggests that countries with more independent central banks

tend to experience lower and more stable inflation over time. Once credibility is lost, restoring it often requires much harsher monetary tightening later, imposing even greater economic pain in the form of higher unemployment or slower growth. In this sense, short-term political comfort can generate long-term economic instability.

Winners and Losers

The politicisation of central banking also creates distinct economic winners and losers. Governments may benefit in the short term from lower borrowing costs, particularly when managing large fiscal deficits. Asset markets and borrowers may also gain from looser monetary conditions, as lower interest rates can support investment and property prices. However, savers and wage earners often bear the long-term costs, as higher inflation erodes real incomes and purchasing power. Currency depreciation can further reduce living standards by increasing the cost of imported goods, disproportionately affecting lower-income households. Over time, the broader economy may suffer through greater income inequality, reduced investment and financial instability.

Democracy Versus Stability

From a democratic standpoint, calls for greater oversight of central banks are not entirely unfounded. However, allowing monetary policy to become subject to electoral incentives risks weakening the credibility required to maintain price stability, often forcing harsher economic adjustments later.

The era of perfectly insulated central banks may never have truly existed, but the boundary between politics and monetary policy is now visibly thinner. Rising debt, persistent inflation, and populist pressures have made central banking increasingly political. The challenge for modern economies is no longer whether politics should influence monetary policy, but how much influence can be tolerated before economic stability begins to erode.



A Retrospective on Monetarism for the 21st Century

by Sushant Shyam

In the 1970s, persistently high inflation was triggered by the oil crisis, and was widely seen to have been exacerbated by expansionary fiscal and monetary policies of Western governments. In other words, it was argued that the precipitous increase in money supply pursued by policymakers was done in a way that either failed to increase or actually hindered economic output at the same time, and was done too quickly. This had caused the phenomenon of 'stagflation', in which inflation rose at the same time as economic growth falling, widely seen as an example of the principle behind both the Phillips curve and Keynesian approaches to recessions breaking down.

This phenomenon triggered heightened interest and pursuit of a monetary system that could effectively address the shortcomings of Keynesian supply-side doctrine, and the reliance on an inverse relationship between inflation and unemployment. It was from this demand that widespread exploration of 'Monetarism', a doctrine championed by the economist Milton Friedman, was pursued. Friedman famously stated that inflation was "always and everywhere a monetary phenomenon", a description that acted as the foundational logic behind his proposed monetary system, aptly named 'Monetarism'. The Monetarist solution to this phenomenon was centred around the integralness of avoiding high inflation, specifically by restricting the supply of money in circulation. For example, Friedman advocated a 'k-percent rule', wherein monetary supply would only increase at a fixed rate each year irrespective of business cycles, and not counter-cyclically as had been advocated by Keynes.

Friedman's ideas, with the backing of his Chicago School grouping of fellow economists, gained the interest of policymakers at the onset of the 1980s, and were especially the subject of experiments in both the United States and the United Kingdom. Paul Volcker, chief of the Federal Reserve, sought to follow the Friedman rule by restricting money supply from 1979 onwards, and the Thatcher government also took that approach in tackling the high inflation which she had

inherited. In both cases, a reduction of inflation was successfully achieved - for example, Thatcher saw inflation come down from 10.3% to 4.6%.

But the proposition that a contractionary policy would not yield the natural result of the Phillips curve's model did not pan out as hoped. A recession in the early 1980s saw a large hike in unemployment in countries which pursued a Monetarist approach, with unemployment more than doubling in the UK. Additionally, the foundations behind Monetarism as a theory was questioned as empirical data came in. The principle that monetary supply correlated strongly with inflation derived from a stable relationship between supply and velocity of money. While this seemed clear in the 1970s, the relationship chain broke down in the 1980s thanks to variations in demand for money, reducing the effectiveness of a fixed supply determination. With the emergence of these perceived shortcomings, Monetarism's dramatic rise was seemingly reversed by Western governments. Though taming inflation remained important to the



monetary agenda, it was pursued through inflation-targeting via short-term interest rates, flexible in response to business cycles, and counter-cyclical when needed. Monetarism's inflation focus was simply subsumed into the new neoclassical synthesis, dominant up till today, and was nominally no longer considered a cohesive doctrine in practice.

But when we look at the issues of inflation, unemployment, and growth in economies today, can we really say that the current approach to monetary issues has been successful? The answer, it would appear, is mixed. 2008 showed the world the limits of Central Banks using interest rates to stimulate growth, something Friedman identified as a persistent issue in his framework - with interest rates close to zero, economies were nevertheless resistant to borrowing and investment in the cradle of a major financial crash, and a liquidity trap was triggered. With the usefulness of heightened money supply being questioned, central banks made a bold and novel decision - to engage in a process called Quantitative Easing, whereby assets held by commercial banks would be purchased by the central bank in order to provide an injection into the economy. The BoE alone burnt through £895 billion through this alone by 2021. As the economy recovered from this phenomenon, the BoE has sought to claw back this accrued debt through Quantitative Tightening - but this process has led to significant taxpayer losses, thanks to a swell in QE reserve interests being paid by the BoE in comparison to the rates at which they were purchased from commercial lenders in 2009.

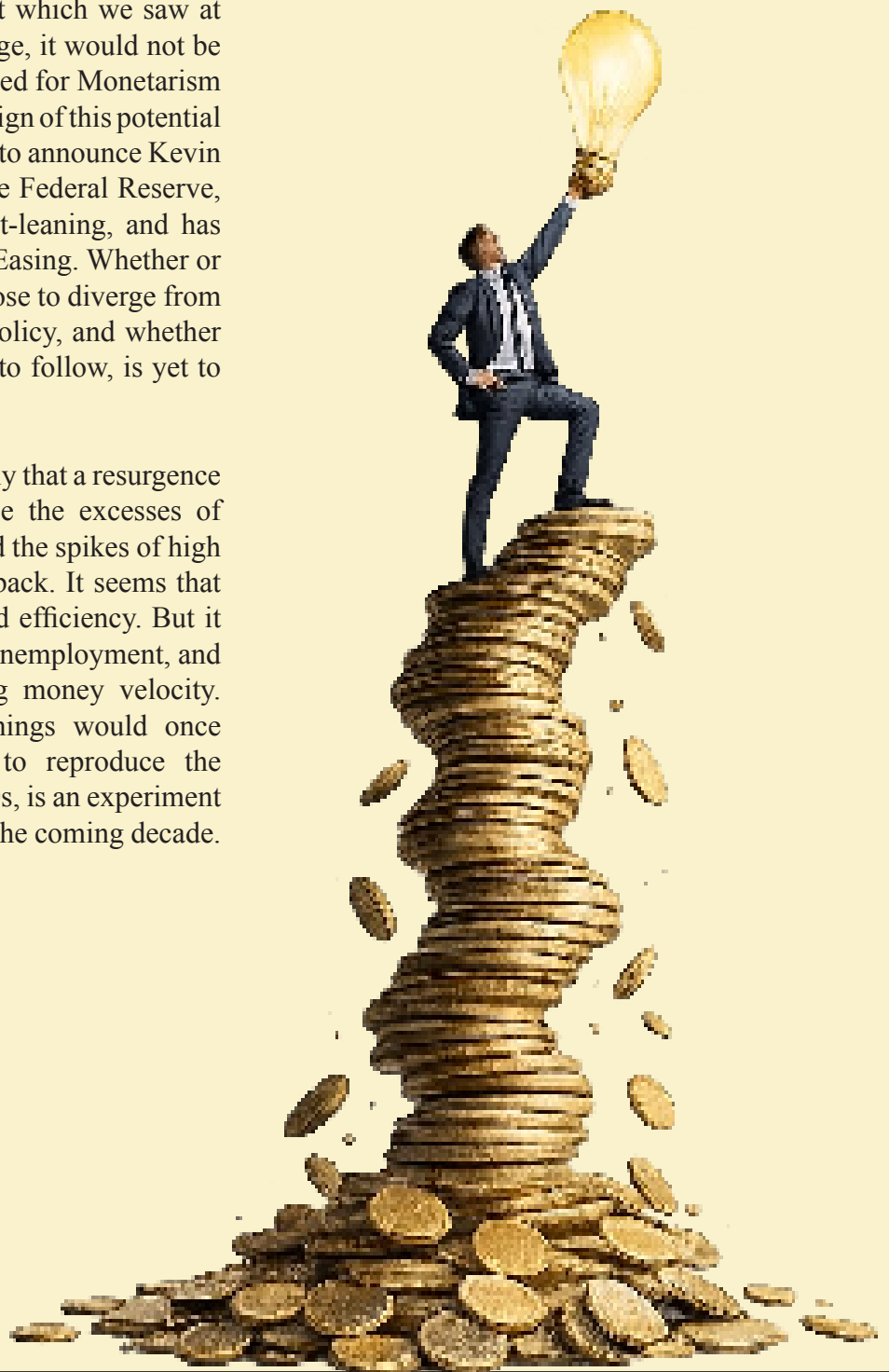
Could a Monetarist approach have avoided this misfortune? Some have argued that the swell of money supply pursued following the Great Recession, in line with a counter-cyclical monetary approach, has created more trouble in long-term losses than the short-term relief was worth. Losses through interest discrepancies, it could be argued, is the penalty of this approach, which may have been avoided where the k-percent rule abided by. And that is not all the expansionary monetary policy has been blamed for. With the fuelling of zombie firms through artificially low rates, and distortion of asset prices, the M2 (money supply) boosting regime may not have produced the real growth needed to justify these losses.

What about the monetary response to the economic implications of the COVID-19 pandemic? We may not have the long-term data to be conclusive on this, but already we are seeing trends that seem to match the Monetarist framework. An expansionary policy driven by lower rates up until late 2021 was seen as contributing to a surge in inflation to more than 11%, the cumulative effect of which has compounded the longer-term cost of living crisis. The BoE was criticised for its failure to identify the link between supply and inflation, and its reliance on flexible rate changes was seen as contributing to excessive inflation due to a perception that it was slow to act, and multiple inflation expectation adjustments thanks to model errors. The Monetarist case, once again, has played into commentator's remarks on the perceived failings.



Still, any return to the Monetarist ascendancy of the 1980s has not taken hold of policymakers yet. While the relation between money supply and inflation has remained painfully obvious, the difficulty in modelling the effects of money velocity complicates the practical introduction of the Monetarist ideal. Furthermore, the political unpopularity of Central Banks being slow to act to control unemployment during recessions may continue to hurt the practicality of a system which discourages countercyclical expansion. But if contemporary failures on inflation and long-run productivity continue to grow, and more bouts of stagflation like that which we saw at the beginning of this decade emerge, it would not be surprising to see the voices loudened for Monetarism in its full-fat form to re-emerge. A sign of this potential is the decision of President Trump to announce Kevin Warsh as the next Chairman of the Federal Reserve, who is widely seen as monetarist-leaning, and has been a loud critic of Quantitative Easing. Whether or not the Fed under Warsh does choose to diverge from the new consensus of monetary policy, and whether or not other central banks decide to follow, is yet to be seen.

If this does take place, it seems likely that a resurgence in Monetarist approach could see the excesses of expansionary monetary policy, and the spikes of high inflation it has fuelled, be rolled back. It seems that the economy could see heightened efficiency. But it could also bring back anger over unemployment, and renewed difficulties in modelling money velocity. Whether these historic shortcomings would once again undermine any attempts to reproduce the Monetarist ascendancy of the 1980s, is an experiment which we may yet see play out in the coming decade.



The UK's Productivity Puzzle as a Wages Puzzle: A Time-Series Analysis of Productivity, Pay, and Institutions (1995–2024)

by Atreyi Roy

For the past two decades, the United Kingdom has experienced what is commonly termed the productivity puzzle, that is, a prolonged stagnation in labour productivity growth relative to its historical trend and international peers. Prior to the 2008 financial crisis, output per hour worked rose steadily, supporting real wage growth and rising living standards. However, since then, productivity growth has slowed dramatically, averaging close to zero for much of the post-crisis period. At the same time, real wages fell sharply and only returned to their pre-crisis level more than a decade later. This coexistence of high employment, weak pay growth, and stagnant productivity has produced a paradox: people are working more, but living standards have barely improved.



Standard economic theory treats productivity as the engine of wage growth. Yet this article reverses the lens and asks whether weak wages themselves may now be constraining productivity. Persistently low pay may reduce incentives for firms to invest in skills, technology, and worker retention, thereby weakening productivity growth over time. Using a time-series framework from 1995 to 2024, this article investigates whether deteriorating wage dynamics and labour-market institutions have contributed to the UK's productivity slowdown and whether Brexit has further intensified these trends.

The Theoretical Framework- Wages, Productivity, and Institutions

In neoclassical theory, the real wage reflects the marginal product of labour. This implies that productivity growth should raise wages. However, this relationship relies on institutional conditions: competitive labour markets, strong worker bargaining power, and a stable distribution of income between capital and labour. If wages stagnate due to declining bargaining power through falling union density, insecure work, and monopsonistic labour

markets productivity may suffer as well. Low wages reduce incentives for workers to acquire skills and for firms to adopt productivity-enhancing technologies. Over time, this can generate a low-pay, low-productivity equilibrium. This dynamic also has an intergenerational dimension. Younger cohorts depend overwhelmingly on labour income, while older cohorts rely more on asset and capital income. When productivity gains are captured by capital rather than labour, inequality widens and living standards diverge. The productivity puzzle is therefore not simply about technology or investment, but about how labour is rewarded and incentivised.

Brexit as a Structural Shock

Brexit represents a major structural shock to the UK economy. Since the 2016 referendum and more sharply after the 2020 transition period the UK has experienced reduced trade intensity, weaker business investment, labour shortages in key sectors, and rising non-tariff barriers with the EU. These changes are likely to have depressed productivity directly. However, this has also suppressed long-term

investment in training and innovation. This article treats Brexit as a potential structural break in the productivity process, asking whether the productivity wage relationship weakened further after 2016 and whether post-Brexit conditions have amplified the low-pay, low-productivity dynamic.

Empirical Methodology and Data

To examine whether weak wage growth has contributed to the UK's productivity slowdown, and whether this relationship changed after the 2008 financial crisis and Brexit, the analysis proceeds in three stages. First, simple bivariate regressions are used to explore the unconditional relationship between productivity and each of the main explanatory variables. Second, the sample is split into pre- and post-2008 periods to test whether the wage productivity relationship weakened after the crisis. Third, a Brexit dummy variable is introduced to capture the post-referendum structural break in productivity dynamics. Finally, a full multivariate model is estimated to assess the joint effects of wages, institutions, macro conditions, and Brexit. Throughout, the dependent variable is labour productivity, measured as $\ln(\text{Output per hour worked})$. The main explanatory variable is $\ln(\text{Real wages})$, constructed by deflating nominal earnings by the CPI. Institutional and macro controls include collective bargaining coverage, the labour share of income, and the unemployment rate. A Brexit dummy variable takes the value 1 from 2016 onwards to capture the referendum-induced uncertainty shock to investment and labour markets.

Baseline Results: The Wage–Productivity Elasticity

The analysis begins with a simple bivariate specification:

$$\ln(\text{Productivity}) = \alpha + \beta \ln(\text{Real Wage}_t) + \varepsilon_t$$

where productivity is measured by output per hours worked and real wage is calculated via

$$(\text{Nominal earnings})/\text{CPI} \times 100$$

The log-log formulation allows us to consider the coefficient on real wage as an elasticity.

The regression obtained is

$$-2.4617 + 1.1097 \ln(\text{Real Wage}_t)$$

The coefficient of real wage is positive, and is highly statistically significant, implying that a 1% increase in real wages is associated with a 1.11% increase in output per hour worked, on average over the period. The strength of this relationship is also reflected in the model's explanatory power: real wages alone explain around 77% of the variation in UK labour productivity over the sample ($R^2 = 0.771$). This strong positive association is consistent with the theoretical prediction that higher pay is linked to higher worker efficiency and investment in skills. However, as a bivariate time-series relationship, the result should be interpreted as a correlation rather than a causal effect, especially given the presence of common trends and potential structural breaks such as the 2008 financial crisis. Graphical inspection of indexed series suggests that productivity and wages move closely together prior to 2008 but diverge thereafter, motivating a formal test for structural change.

Structural Break Analysis: Pre- and Post-2008

To test whether the wage productivity relationship weakened after the financial crisis, the sample is split into two sub-periods:

- Pre-crisis: 1995- 2007
- Post-crisis: 2008-2024

The baseline regression is estimated separately for each period:

$$\ln(\text{Productivity}_t) = \alpha_i + \beta_i \ln(\text{Real Wage}_t) + \varepsilon_t$$

for {pre-2008, post-2008}

Before 2008, the elasticity of productivity with respect to real wages is strong, positive, and highly significant, as seen by the regression

$$-1.9298 + 1.0210 \ln(\text{Real Wage}_t)$$

The estimated coefficient on real wage is 1.0210, implying that a 1% increase in real wages was associated with roughly a 1% increase in output per hour worked. Real wages alone explain almost the entire variation in productivity during this period ($R^2 = 0.973$), indicating a tight co-movement between

pay and performance in the pre-crisis UK economy. In sharp contrast, the post-2008 relationship collapses.

The regression obtained for this is

$$6.1665 - 0.2595 \ln(\text{Real Wage}_t)$$

The coefficient on real wages becomes negative and statistically insignificant, with explanatory power falling dramatically ($R^2 = 0.202$). This indicates that after the crisis, changes in real wages no longer translated into productivity growth. Graphically and econometrically, the data suggest a clear decoupling: productivity stagnates even as wages evolve independently. This breakdown supports the interpretation that the UK's productivity puzzle is also a wages puzzle. The institutional and macroeconomic environment after 2008 weakened the mechanism through which pay, effort, and skills investment feed into output per hour.

While the pre- and post-2008 comparison establishes a clear structural break in the productivity–wage relationship, it does not explain why this decoupling emerged. The financial crisis marks a turning point, but it coincides with deeper changes in the UK's labour-market institutions and macroeconomic environment. In particular, the post-crisis period is characterised by weaker bargaining power, declining union density, and heightened policy uncertainty. One of the most salient institutional shocks is Brexit, which introduced a persistent climate of uncertainty for firms and workers alike. To move beyond description and towards explanation, the next stage of the analysis extends the baseline model by incorporating a Brexit dummy and institutional controls, allowing us to test whether the post-2008 breakdown reflects not just cyclical weakness, but structural changes in how productivity gains are generated and distributed.

Brexit and Post-Referendum Productivity Dynamics

To examine whether Brexit further altered productivity dynamics, a Brexit dummy variable is introduced:

$$\ln(\text{Productivity}_t) = \alpha + \beta \ln(\text{Real Wage}_t) + \delta \text{Brexit}_t + \varepsilon_t$$

where $\text{Brexit}_t = 0$ for $t < 2016$ and $\text{Brexit}_t = 1$ for $t \geq 2016$.

The coefficient captures the average shift in productivity growth associated with the post-referendum period, conditional on wages. The regression obtained is

$$-2.2514 + 1.0752 \ln(\text{Real Wage}_t) + 0.0595 \text{Brexit}_t$$

The results show that the elasticity of productivity with respect to real wages remains strong and highly significant once Brexit is controlled for. The coefficient on real wages is 1.0752 ($p < 0.001$) implying that a 1% increase in real wages is associated with a 1.08% increase in output per hour worked. In addition, the Brexit dummy enters with a positive and statistically significant coefficient of 0.059. This suggests that, conditional on real wages, average labour productivity is around 6% higher in the post-referendum period than would otherwise be predicted by wages alone. Rather than capturing a direct productivity boost from Brexit itself, this coefficient likely reflects compositional and measurement effects such as labour-market tightening, sectoral shifts, and the exit of lower-productivity firms or workers which mechanically raise output per hour even as underlying growth weakens. Taken together, the results indicate that Brexit altered the structure of the productivity wage relationship, but did not restore the pre-2008 pass-through from pay to performance.

Full Multivariate Model: Institutions and Macroeconomic Controls

Finally, to account for institutional and macroeconomic conditions, the full model is estimated:

$$\ln(\text{Productivity}_t) = \alpha + \beta_1 \ln(\text{Real Wage}_t) + \beta_2 \text{Bargaining}_t + \beta_3 \text{LabourShare}_t + \beta_4 \text{Unemployment}_t + \delta \text{Brexit}_t + \varepsilon_t$$

This specification allows the effect of wages on productivity to be interpreted conditional on worker bargaining power, income distribution, and labour-market slack. The inclusion of the Brexit dummy tests whether productivity has shifted structurally even after controlling for these channels. Given the limited sample size and the use of annual data, the results should be interpreted as indicative rather than causal, highlighting long-run patterns rather than short-term dynamics.

The regression obtained is

$$3.3127 + 0.1512\ln(\text{Real Wage}_t) - 0.0057\text{Bargaining}_t + 0.0089\text{LabourShare}_t - 0.0006\text{Unemployment}_t + 0.0074\text{Brexit}_t$$

The full multivariate regression shows that, once institutional and macroeconomic controls are included, the direct effect of real wages on productivity becomes positive, with coefficient 0.151, but statistically insignificant ($p=0.627$), suggesting that wage growth alone no longer reliably predicts output per hour when accounting for other factors. Collective bargaining coverage enters with a negative coefficient and is marginally significant ($p=0.051$), indicating that higher unionisation may be associated with slightly lower measured productivity, potentially reflecting rigidities or compositional effects in the labour market. Labour share, unemployment, and Brexit show small, statistically insignificant coefficients, implying limited direct impacts in this specification. Overall, the model retains a relatively high R^2 of 0.777, indicating that these variables jointly explain a substantial portion of productivity variation, but the individual effects of wages and institutional factors appear weaker than in the simple bivariate regressions. This supports the broader narrative that post-crisis UK productivity stagnation cannot be attributed to wages alone, but rather reflects interactions among pay, labour-market institutions, and structural shocks such as Brexit.

Policy Implications: Restoring the Wage–Productivity Link

The results suggest that the UK's productivity stagnation cannot be solved by growth policy alone. Weak wage growth and declining labour-market

power appear to be constraining productivity itself, implying that restoring the wage productivity link is essential for sustained improvements in output per hour.

Labour-market institutions therefore matter. Strengthening collective bargaining, improving pay transparency, and reducing monopsony power through limits on non-compete clauses and greater job mobility would increase competition for workers and incentivise firms to invest in skills and technology rather than relying on low-cost labour strategies. Brexit-related trade frictions and investment uncertainty must also be addressed. Policies that stabilise regulatory expectations and support exporting firms are necessary to rebuild business investment and productivity growth. Monetary policy alone is an imprecise tool for solving the productivity puzzle. A coordinated approach combining labour-market reform, competition policy, and investment support is more likely to deliver durable productivity and wage growth.

In sum, the UK's productivity puzzle is deeply intertwined with wages and labour-market institutions. The analysis shows that while real wages historically boosted productivity, this link weakened after the 2008 financial crisis and remains fragile in the post-Brexit era. Low pay, reduced bargaining power, and structural shocks have collectively constrained output per hour, suggesting that addressing productivity stagnation requires more than conventional growth policies. Strengthening labour-market institutions, supporting fair wage growth, and reducing structural uncertainties are essential to restore incentives for skills investment and innovation. Only through such a coordinated approach can the UK achieve sustainable improvements in both productivity and living standards.



The Error Term

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Love in the Language of Economics

by Samuel Ducrey

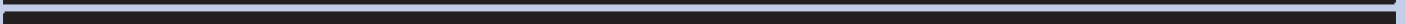
*“Though my many faults defaced me,
Could no other arm be found,
Than the one which once embraced me,
To inflict a cureless wound?” — Byron*

Romantic poets understood love as a risk long before economists tried to model it. Marriage transforms that emotional gamble into something more concrete: a contract in which two people share income, costs, and uncertainty in the hope of improving their lives. Seen this way, marriage is not only a declaration of commitment, but one of the most significant risk-sharing decisions individuals ever make.

Long before students stopped to see Bentham’s remains in the Student Centre, people instinctively made decisions by weighing costs against benefits. Through this lens, marriage can be seen as a contract that individuals enter when the expected gains from being together outweigh those of remaining single, once the financial, emotional, and social costs of the arrangement are taken into account.

Such a statement may initially seem trivial, but let’s investigate all the microeconomic advantages of a marriage. The first one is that this contract is a mutual insurance against shocks of all kinds. Although 83% of married couples reportedly pool their entire income in the US, marriage smooths income in ways that go beyond simply adding a second paycheck. When partners pool their earnings, the household is better able to absorb shocks such as job loss, reduced hours, or unexpected expenses. Consumption does not need to fall immediately because resources are shared across the couple.

This kind of full income pooling is also more common among married couples than among cohabiting partners, reflecting a stronger expectation of commitment and shared finances. Research by Kasey Eickmeyer and her coauthors shows that about 83% of married couples completely pool their income. Even when differences such as age and earnings are taken into account, roughly 80% still do so. The implication is that marriage is strongly associated with treating income as a collective resource rather than an individual one.



Income smoothing also operates over the longer term through career risk. Marriage often diversifies the household's exposure to sector-specific shocks. If one partner works in a cyclical industry such as banking, construction, or finance, the other is frequently employed in a different field and can maintain earnings when that sector slows. Only 4 to 13% of couples share the same occupation, which reduces the likelihood of simultaneous income losses. We will come back to this point later, since sector overlap can also have important implications for household welfare.

If income pooling and diversification make marriage look like a sort of private insurance scheme, its wider role becomes clearer when we think of it as a long-term relational contract. Unlike most contracts, marriage is not negotiated in detail or rewritten every time circumstances change. Instead, it sets up a loose but powerful framework that lets two people organise their lives together without constantly renegotiating the terms.

At its simplest, marriage works as an implicit agreement of mutual support. Partners expect to help each other through income shocks, illness, career interruptions, and the slower uncertainties of aging. This expectation makes certain trade-offs possible. One partner may focus more on paid work while the other temporarily prioritises childcare or domestic tasks. Or both may work while dividing the quieter forms of labour that keep daily life running: managing bills, planning schedules, maintaining social ties, organising the invisible logistics of a household. None of this usually gets written down, but the stability of the arrangement rests on the belief that today's sacrifices will be balanced by tomorrow's shared benefits.

Marriage also makes shared consumption easier. Many of the items we need are cheaper to provide jointly than separately. Housing, heating, internet, furniture, transport, and more importantly children all involve fixed costs that fall per person when shared: a small form of economies of scale. Official income measures assume a second adult adds only about half the cost of the first, showing that living together really is cheaper than living separately. Living together stretches resources further and reduces duplication. These savings are not particularly romantic, but

they form a real part of the economic logic behind marriage.

There is also a legal dimension that strengthens this arrangement. Marriage often clarifies property rights or inheritance, parental responsibilities, and even recognition in tax or welfare systems. Most couples (hopefully) rarely think about these rules day to day, but they matter in the background. They reduce uncertainty and make long-term planning simpler. Importantly, they also provide default answers to questions that would otherwise need repeated negotiation.

From an economic perspective, this reduces what are known as transaction costs. Without marriage, partners would need to keep renegotiating issues like rent payments, childcare tasks, or ownership of common assets. Marriage supplies ready-made expectations that lower the need for constant bargaining. In this sense, it looks less like a romantic symbol and more like an organisational tool. Two individuals pool labour, income, and risk under a stable structure because doing so is easier than coordinating everything informally.

If marriage works as a contract in this way, its most important function may be risk sharing. Markets can insure some risks, but they struggle to insure others. Career sacrifices, emotional support, or long-term caregiving rarely have formal insurance products attached to them. Marriage often fills that gap, acting as a private safety net when formal systems fall short. But this raises a broader question. Even if marriage is economically efficient, does it actually make people happier?

Economists usually approach this through measures of life satisfaction rather than poetry. The basic idea is straightforward: if marriage increases well-being, we should see it reflected in how people report their lives over time. The difficulty is separating cause from selection. Do people become happier because they marry, or do happier people simply tend to marry more often?

One way around this is to follow the same individuals before and after marriage. Using long-term German panel data, Salmai Qari (2014) finds that life satisfaction typically rises around the time

people marry and, although it falls after the initial honeymoon period, it often stabilises at a level still higher than before marriage. Interestingly, the size of this long-term gain depends strongly on what is used as the baseline comparison period. Change the reference point and the results can suggest either lasting benefits or full adaptation. Even so, the evidence points to marriage providing more than just a short emotional spike for many couples. In Qari's estimates, life satisfaction five years after marriage remains roughly 0.2–0.35 points higher on a 0–10 scale compared to the pre-marital baseline.

That said, the gains are not universal. The evidence suggests that the link between marriage and happiness is not uniform. If both partners face ongoing financial insecurity, risk pooling may simply pool stress. If one partner holds much more economic power, household decisions may become inefficient or unfair, lowering welfare for the less stable partner. And persistent conflict can outweigh any financial or practical advantages of shared living. In those cases, the contract that was meant to reduce uncertainty may end up amplifying it.

This suggests something slightly uncomfortable. The economic case for marriage is conditional and practical. It explains when the institution works and when it does not. But it does not fully explain why people enter it in the first place.

Because outside the models, love is not primarily about reducing uncertainty. If anything, it involves accepting it. Marriage tries to stabilise that uncertainty through shared finances, legal recognition, and social expectations, but it never removes it entirely. A spouse is both your main source of support and the person most capable of hurting you, which Byron grasped long before economists began studying household bargaining.

So marriage ends up occupying an odd space between calculation and vulnerability. Economically, it is a risk-sharing arrangement designed to smooth shocks and coordinate long-term decisions. Emotionally, it is a willingness to tie your future to someone else without full information about how either of you will change. The economics of marriage helps explain why the institution persists. The poetry explains why people keep choosing it anyway.



The Price of Belonging

by Dhvani Aachi

In today's global economy, money can cross borders far more easily than people can. Yet for those with sufficient capital, cross-border mobility is no longer out of reach. A Caribbean passport costs up to six figures. An EU golden visa may require an investment of €250,000 to €500,000. While millions face years-long visa processes or are denied movement altogether, borders become negotiable for those who can pay.

Citizenship-by-investment (CBI) and "golden visa" programmes allow individuals to obtain citizenship or residency in return for financial investment, rather than through long-term residence or labour participation. Originally expanded by small or debt-pressured states in the aftermath of the 2008 financial crisis, these schemes have grown into a competitive global market. The Henley Passport Index, which ranks passports by visa-free access, illustrates the sharp mobility gaps that underpin demand for such programmes.

If access to citizenship is put on the market, what does that imply for sovereignty and global inequality?

Why This Market Exists

Citizenship has economic value because it determines access to stable legal systems, high-income labour markets, secure property rights, and political protection. In economic terms, citizenship resembles a club good. It is largely non-rival, since one additional citizen does not usually reduce the mobility value of a passport, but it is strictly excludable because states control entry.

On the demand side, CBI programmes respond to global inequality in stability and income. Large wage gaps persist between countries, and political institutions vary widely in quality. For wealthy individuals in politically unstable, sanction-prone, or economically volatile states, a second passport functions as insurance, providing an exit option if domestic conditions deteriorate. In this sense, citizenship becomes a way to manage risk across countries rather than just across financial assets.

On the supply side, many states offering CBI or golden visa schemes face structural constraints.

Small economies with narrow tax bases, high debt burdens, or limited export capacity cannot easily compete in global manufacturing or high-value services. Therefore, selling legal access becomes an alternative revenue strategy, as states effectively "export" membership instead of goods or services. Additionally, such programmes fund infrastructure and reduce reliance on volatile sectors such as tourism. In several Caribbean states, CBI revenues have made up a double-digit share of GDP, reaching nearly 30 percent of GDP in Dominica in recent years and about 37 percent of GDP in FY2022/23, providing a crucial buffer after natural disasters or tourism slumps.

The Immediate Trade-Offs

However, these programmes come with significant trade-offs.

First, revenue from these investor schemes can be unstable. Demand often increases during global uncertainty, but can decline quickly if regulations tighten or political conditions change; Spain, for instance, has suspended its golden visa scheme, and EU-level pressure has pushed Malta to wind down direct CBI. Governments that depend on these programmes tie part of their fiscal stability to highly mobile individuals who can move their attention and their money elsewhere at short notice.

Second, golden visa schemes that rely on property investment may contribute to housing price inflation, especially in smaller markets. In Portugal, real estate routes once made up most golden visa investment and were linked to price pressures in cities such as Lisbon and Porto, prompting reforms that phased out the property option. Capital may flow into real estate instead of into productive sectors such as manufacturing or innovation. This raises the question of whether investors are contributing to long-term growth or simply purchasing access.

Third, reputational and governance risks are significant. Weak due diligence can expose states to accusations of enabling money laundering or sanctions evasion, which is why international bodies have highlighted CBI/RBI schemes as potential channels for tax evasion and illicit finance. Even

when programmes operate legally, the perception that citizenship is for sale can generate domestic resentment and international scrutiny. In the EU, legal and political challenges to investor citizenship schemes have been justified partly by concerns about security and the integrity of shared borders.

Finally, another trade-off concerns how these programmes interact with global tax fairness. Wealthy individuals can build fortunes using the labour, infrastructure, and resources of one country, then use CBI or golden visas to shift residence to lower-tax jurisdictions while retaining access to public goods at home. This ability to separate where wealth is made from where obligations are owed can leave origin states with narrower tax bases and deepen the sense that the gains from globalisation are privatised by a mobile elite, while its costs remain with those who cannot leave.

What Changes When Citizenship is Priced

When citizenship can be bought, the consequences reach beyond government revenue and into how inequality, sovereignty, and political membership may evolve in the future. Global wage differences persist partly because borders restrict labour movement, and citizenship determines who can access these legal and economic protections. When citizenship becomes purchasable, wealth increasingly substitutes for birthplace: those with capital can secure mobility and protection in multiple jurisdictions, while those without remain bound to the passport they inherit.

This market for passports also sharpens inequalities in how mobility is distributed. For the wealthy, a six-figure investment can shorten or even bypass the long queues for residency and citizenship that most migrants face, turning what is for many a years- or decades-long process into an administrative transaction. When some can effectively buy secure status and visa-free travel while others remain stuck in precarious, temporary arrangements, the sense of unfairness can feed domestic resentment and deepen wealth inequality within countries as well as between them, with potential knock-on effects for social cohesion and political stability. The immediate beneficiaries are often property developers, financial intermediaries, and segments of the urban elite,

reinforcing existing class hierarchies even as programmes are defended in the language of national development.

Looking ahead, the implications extend to political accountability and reform. When exit is easy for economic elites, the most influential actors can avoid the costs of weak institutions rather than push to change them. At the same time, states that rely on attracting wealthy investors may feel compelled to continually adjust regulatory and fiscal rules to remain competitive.

The bigger question is not just whether these programmes raise revenue, but whether pricing membership changes how states act and deepens the divide between those who can buy security and those who cannot. In this sense, CBI creates a form of representation without meaningful residence for investors, while many long-term migrants remain in the opposite position: living, working, and paying taxes without full political voice. The market for membership thus sits uneasily alongside democratic ideas about who the political community is for.

Conclusion

CBI and golden visa schemes are often defended as practical tools to raise revenue, diversify economies, and cushion external shocks. Yet their significance extends beyond fiscal strategy. By attaching a price to access stable institutions, legal protection, and mobility, these programmes expose how unevenly security and opportunity are distributed in the global economy. As more states experiment with monetising entry, it becomes easier to treat membership as an economic instrument rather than a shared political bond, blurring the line between citizen and customer, and reframing sovereignty as something that can be strategically leveraged.

The central issue, then, is less about whether these programmes will persist, and more about what kind of citizenship they normalise if they do. If access to protection and mobility increasingly depends on wealth, the gap between those able to secure safety across borders and those constrained by the passport they inherit is likely to widen further.



Do Congestion Charges Actually Work?

by Dimitrios Zikos

Every weekday morning, millions of people attempt to move through the same narrow corridors of urban space at the same time. Roads in dense cities are not infinite: they are scarce public infrastructure used simultaneously by private drivers, delivery vehicles, buses, taxis, and emergency services. Yet access to that space is typically free at the point of use. The result is predictable. Each additional car imposes time delays, pollution, noise, and reliability costs on all stakeholders, including drivers. Congestion, in this sense, is not merely an inconvenience; it is a market failure.

Conventional economic wisdom would suggest a few solutions to such an issue, chief among them a tax. By charging drivers to enter the busiest areas of their city, congestion pricing aims to make road use reflect its true social cost rather than treating scarce urban space as costless. The idea is hardly radical; economists have, for decades, argued that when something scarce is underpriced, it will be overused. Following this logic, cities from Singapore to London and Stockholm have implemented congestion pricing schemes that measurably reduced traffic, improved travel times, and generated revenue for public transport. Among transport policies, congestion pricing is one of the most theoretically grounded and empirically tested tools available.

And despite its proven efficacy, whenever a city attempts to introduce it, political resistance is fierce. The recent debates in New York, where policymakers proposed charging drivers to enter Manhattan's central business district, show this paradox clearly. Opposition has centred not on whether congestion exists, but on who would bear the cost of fixing it. Critics argue that congestion pricing is regressive, disproportionately burdening low- and middle-income drivers, outer-borough residents, and workers with inflexible commutes. Others frame it as an unfair "pay-to-play" system that allows the wealthy to buy faster roads while pricing out everyone else. Therefore, the debate surrounding congestion pricing is two-fold: a question of efficacy, and a question of equity. Can pricing scarce road space be reconciled with principles of fairness?

Economic Logic

Roads appear as a form of a public good because they are difficult to exclude users from and are publicly provided. But unlike a pure public good such as schools, city road use is not non-rivalrous: once traffic approaches capacity, each additional driver reduces the speed and reliability of everyone else's journey. At that point, the road functions less like a classic public good and more like a congestible common-pool resource, whose overuse reflects the absence of a price that rations the scarce space.

As such, congestion pricing works to correct an imbalance: drivers consider their private cost of a trip (fuel, time, parking) but not the social cost they impose on others. The difference between the marginal private cost and the marginal social cost is the classic negative externality identified in welfare economics. When access to a scarce resource is free, demand will exceed the socially optimal level. As the economist Arthur Pigou argued, a tax equal to the external cost can align private incentives with social welfare. Congestion pricing operationalizes this insight: by charging drivers in the most high-demand places, it nudges some trips to different routes, or modes of transport, relieving congestion.

This policy does not eliminate travel; it reallocates scarce road space to trips that users value most. Some drivers reschedule, some carpool, some switch to public transport, and some choose not to travel at all. The result is fewer vehicles competing for the same bottleneck at the same time. In welfare terms, this reduces deadweight loss: fewer hours are wasted in traffic, buses become more reliable, and emissions decline. The policy's economic logic is (in theory) not punitive but corrective; it prices what was previously unpriced.

Empirical Results

Empirical results largely back the theory. Well-designed congestion fees quickly cut traffic volumes and speed up remaining vehicles. Central London traffic fell roughly 25% over the past decade, and under Singapore's Electronic Road Pricing system (in place since 1975) peak-hour gridlock has been largely tamed. Additionally, the London charge is credited with 30 fewer monthly crashes in the centre (about a 40% reduction) as well as increases in cycling and walking. Congestion pricing also generates substantial revenues, which are typically reinvested in transport: London directed over 80% of its 2008 program revenue into bus service improvements, enabling a 50-year high in bus ridership.

There are also important side benefits. By cutting vehicle traffic, congestion pricing reduces air pollution in the city as a whole. One review found that London's scheme is estimated to have gained 183 life-years per 100,000 people over a decade via cleaner air, with Stockholm similarly gaining 206 life-years per 100k. Fatal crashes have declined in priced zones (studies in London and Milan show fewer incidents with no rise in surrounding areas). Overall, the net effect on population health is positive. With respect to congestion and public health, then, the policy is not speculative – it has repeatedly worked in different political and urban contexts.

The Equity Question

The central objection to congestion pricing is not that congestion is harmless, but that pricing it may be unfair. Critics argue that a flat charge to enter a central district is regressive: a \$15 fee accounts for

a larger share of income for a delivery driver than for a corporate lawyer. In the recent debate in New York City, opponents framed the proposal as a policy that would burden outer-borough workers while allowing wealthier commuters to “buy” faster roads. The symbolism is powerful. Roads are seen as shared public infrastructure, and attaching a price can feel like exclusion.

But distributional evidence complicates the narrative. In cities that have implemented congestion charges — including London and Stockholm — peak-hour car commuters into dense centres tend to be disproportionately middle- and high-income. Lower-income residents are more likely to rely on buses, trains, and walking. If that pattern holds, the direct burden of the charge falls more heavily on relatively affluent drivers, while the benefits — faster buses, cleaner air, safer streets — accrue broadly.

Furthermore, when congestion-pricing proceeds are reinvested in public transport, fare subsidies, and service improvements, the overall effect can be progressive. The policy effectively transfers resources from those who are willing to pay to drive into the centre to those who depend on transit.

Conversely, if revenues disappear into general budgets or if transit alternatives remain weak, the fairness case weakens substantially. If transit is unreliable, overcrowded, or unaffordable, then pricing road access risks constraining essential workers who have few substitutes. Congestion pricing is most defensible when paired with visible improvements in transit capacity and reliability. In this sense, critics are correct; equity is not an automatic outcome of pricing, but a design choice.



Alternative Solutions

Opponents often argue that cities should pursue other measures before charging drivers directly. These alternatives deserve evaluation — but by the same economic logic that motivates congestion pricing.

Fuel taxes, for example, raise the cost of driving overall. Yet they do not vary by location or time of day. A commuter entering a congested central district at 8 a.m. pays the same per litre as someone driving on an empty highway at midnight. The tax does not target the specific scarcity problem: peak demand in particular corridors.

Some cities have experimented with licence-plate rationing schemes. In Beijing, authorities have used odd-even driving rules and registration quotas to limit the number of vehicles on the road at any given time. Such measures can reduce traffic temporarily, but they allocate road space arbitrarily rather than efficiently. Drivers with “restricted” plates may

adjust schedules, purchase second vehicles, or rely on informal workarounds. The policy does not differentiate between a high-value trip and a low-value one; it simply restricts access by rule.

Road expansion appears intuitive, yet evidence shows that additional capacity often induces new demand, restoring congestion over time.

Congestion pricing is distinctive because it targets the bottleneck directly. It prices entry into specific places, matching the true social cost of peak-hour driving. That precision is also what makes it controversial. Alternatives feel less intrusive because their costs are diffuse or hidden. But if the goal is to manage scarcity rather than ignore it, few tools address the problem as directly.



Has Artificial Intelligence Depressed Graduate Wages in the United Kingdom?

by Shreyas Veturi

Generative artificial intelligence has rapidly spread across graduate-heavy professions, representing one of the most significant technological shocks to the modern labour market. Large language models (LLMs) such as OpenAI's ChatGPT and Microsoft Copilot are now directly integrated into core operations in finance, law, consulting and software development – occupations traditionally characterised by a high proportion of human capital. Previous automation waves mainly displaced routine manual labour, but the introduction of AI targets cognitive and analytical tasks that were once considered uniquely able to be completed by university graduates.

As a result, the economic implications are ambiguous. Human capital theory suggests that if the marginal productivity of skilled workers improves with the use of AI, graduate wages should increase. However, task-based models of automation suggest that if routine analytical work is offloaded to AI, especially in junior positions, wage growth will stagnate or even decline. Both these opposing forces can be seen by anecdotal evidence: AI-assisted 'vibecoding' has lowered the barriers to entry for startup creation, yet firms simultaneously report reduced demand for entry-level roles.

The question that arises from this is whether AI exposure is associated with higher real wage growth for graduates.

Coupled with an AI exposure index, occupational wage data from the Office for National Statistics (ONS) can be used to empirically assess whether a complementary or substitutive effect dominates in practice.

If AI primarily complements graduate labour, occupations with higher AI exposure should experience faster real wage growth. This means that AI sufficiently enhances productivity to increase the returns to human capital, so there would be a positive association between AI exposure and real wage changes.

Conversely, if AI substitutes the routine cognitive tasks within graduate roles, wage growth may weaken in higher exposure fields. Entry-level analytical tasks, such as coding and data processing, are particularly vulnerable. Higher AI-exposed occupations would therefore exhibit slower real wage growth relative to less exposed ones.

There is a third possibility: there is no measurable effect on real wages in the short run. There may be a time lag in the diffusion of the technology, with firms gradually adjusting. The rigid nature of employment contracts may also mean delays in observable wage changes.

Quantitative analysis is required to distinguish between these outcomes. Occupational data was drawn from the ONS Annual Survey of Hours and Earnings (ASHE). This provides information on gross weekly earnings across occupations in the UK classified by Standard Occupational Classification (SOC) codes.

The sample covers 2018-2024. This captures data before and after the widespread diffusion of generative AI tools post 2022. Nominal wages have been converted into real terms using CPI inflation data to ensure that recorded changes reflect actual purchasing power.

AI exposure has been measured using an occupational exposure index constructed from task-level assessments of susceptibility to LLM automation. Different occupations were assigned a continuous 'exposure score'. This is based on the proportion of tasks that overlap with capabilities seen by AI. Higher values correspond to greater theoretical exposure to automation. This enables comparison between exposure levels.

The dependent variable, constructed from the ASHE weekly earnings data, is real wage growth by occupation. Nominal wages are adjusted for inflation and then converted into logarithmic changes to measure proportional change. This means that

extreme values have less of an influence. This also allows coefficients to be interpreted in approximate percentage terms rather than numeric values, which is not useful for change analysis.

The primary independent variable is an occupational AI exposure index, mapped to SOC occupations. As exposure is defined by task composition, it is time invariant at the occupation level (AIExposure_i). To facilitate descriptive analysis, occupations are grouped into exposure groups (e.g. low, medium, high) to compare average wage patterns across groups, both over time and between pre and post LLM periods.

The following equation can be written:

$$\Delta \ln(\text{wage}_{it}) = \ln(\text{wage}_{it}) - \text{wage}_{i,t-1}$$

The constant term ‘α’ represents the average wage change across all occupations in the base period, adjusting for included variables.

‘AIExposure_i’ is a time-invariant index that measures the degree to which occupation ‘i’ is exposed to generative AI based on its task composition. The higher the value, the higher the proportion of tasks that overlap with the capabilities shown by LLMs. Since exposure is based on occupational composition instead of year-specific events, it will be constant over time in the regression.

‘Post_t’ is a binary variable, which equals 1 for the post-LLM period, i.e., 2023-2024, and 0 otherwise.

The cross-term ‘AIExposure_i * Post_t’ measures the effect of having more AI-exposed occupations experiencing differential wage growth in the post-LLM period relative to less exposed ones.

The coefficient ‘β’ therefore measures the differential wage growth in the post-LLM period for highly exposed occupations relative to less exposed ones.

- β>0: Complementarity – The effect of AI exposure on wage growth is positive, indicating that AI-exposed occupations experienced faster wage growth in the post-

- LLM period relative to less exposed ones.
- β<0: Substitution – The effect of AI exposure on wage growth is negative, indicating that AI-exposed occupations experienced slower wage growth in the post-LLM period relative to less exposed ones.
- β≈0: No differential effect – The effect of AI exposure on wage growth is zero, indicating no differential effect on wage growth in the post-LLM period relative to less exposed ones.

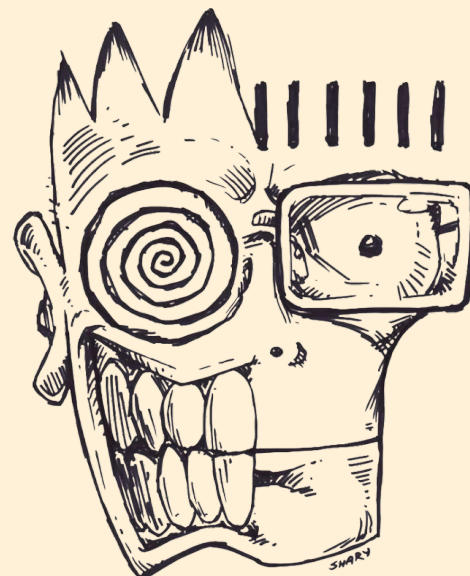
The control variables, in vector X_{it}, include occupational characteristics that can independently affect wage growth, e.g. education levels, sectoral composition and gender composition, among others.

The year fixed effects variable (λ_t) captures economy-wide factors affecting all occupations equally each year. These include inflationary pressures, macro-economic fluctuations, and general labour market conditions, among others.

The error term (ε_{it}) represents the unexplained wage growth not captured by the model.

Running the regression with the data, the following results, which are summarised in the figure on the following page, are obtained.

From Figure 1, the point estimate for the Beta is 0.0005 with a standard error of 0.024 and a p-value of 0.984. This estimate is extremely close to zero, rendering it statistically insignificant. The constructed 95% confidence interval ranges from -0.046 to



OLS Regression Results

Dep. Variable:	dlm_real_wage	R-squared:	0.474
Model:	OLS	Adj. R-squared:	0.254
Method:	Least Squares	F-statistic:	50.40
Date:	Thu, 26 Feb 2026	Prob (F-statistic):	7.8E-06
Time:	13:50:11	Log-Likelihood:	94.65
No. Observations:	45	AIC:	-161.3
Df Residuals:	31	BIC:	-136.0
Df Model:	13		
Covariance Type:	cluster		

	coef	std err	z	P> z	0.025	0.975
Intercept	0.0071	0.0030	2.4820	0.0130	0.0020	0.0130
C(year)[T.2020]	-0.0544	0.0160	-3.5000	0.0000	-0.0850	-0.0240
C(year)[T.2021]	0.0167	0.0220	0.7750	0.4380	-0.0260	0.0590
C(year)[T.2022]	-0.0377	0.0090	-4.3670	0.0000	-0.0550	-0.0210
C(year)[T.2023]	-0.0161	0.0120	-1.3680	0.1710	-0.0390	0.0070
C(soc)[T.2]	0.0020	0.0000	7.0100	0.0000	0.0010	0.0030
C(soc)[T.3]	-0.0147	0.0010	-24.012	0.0000	-0.0160	-0.0140
C(soc)[T.4]	0.0166	0.0010	18.485	0.0000	0.0150	0.0180
C(soc)[T.5]	0.0059	0.0010	4.9800	0.0000	0.0040	0.0080
C(soc)[T.6]	0.0303	0.0010	20.771	0.0000	0.0270	0.0330
C(soc)[T.7]	0.0097	0.0020	5.3970	0.0000	0.0060	0.0130
C(soc)[T.8]	0.0131	0.0020	6.2970	0.0000	0.0090	0.0170
C(soc)[T.9]	0.0101	0.0020	4.2070	0.0000	0.0050	0.0150
exposure x post	0.0005	0.0240	0.0200	0.9840	-0.0460	0.0470

Omnibus:	10.17	Durbin-Watson:	2.889
Prob			
(Omnibus):	0.006	Jarque-Bera (JB):	16.65
Skew:	0.534	Prob(JB):	0.000
Kurtosis:	5.782	Cond. No.	19.50

Notes:

[1] Standard Errors are robust to cluster correlation (cluster)

Figure 1. Regression data from the ASHE

0.047, including economically meaningful negative values. The central estimate, nonetheless, implies no measurable relationship. A 10% increase in the AI exposure index is associated with a 0.005% increase in wages.

The overall model fit is moderate ($R^2 = 0.474$), which means that 47% of the variation in occupation-level wage growth is explained by occupation and year fixed effects. The year fixed effects are reasonable since wage growth declined sharply in 2020 (coefficient -0.0544 , $p < 0.001$), which corresponds to the pandemic shock, and again in 2022 (coefficient -0.0377 , $p < 0.001$), which corresponds to the inflationary squeeze.

The 2023 dummy has a negative but statistically insignificant coefficient (-0.0161 , $p = 0.171$). The occupation fixed effects are statistically significant, which means that there are occupation-level differences in the structural wage growth patterns. But, conditional on these controls, AI exposure does not explain differential post-period wage growth.

Regardless, there are several limitations that affect the results. Firstly, the exposure index shows the theoretical overlap in tasks rather than the actual adoption of AI.⁸ Therefore, there could be a wide range of actual exposure in occupations that the model classifies as being highly exposed to AI. Secondly, the post-treatment period is relatively

short. Wage changes tend to happen annually with some lag. Moreover, generative AI was only adopted in the economy in late 2022. Therefore, the model can only reflect the very beginning of the wage response. The model also estimates the effect at the occupation level. This may mean if the effect of generative AI is mainly on entry-level jobs while wages in higher positions tend to stay the same, the overall wage response might not change, while the internal structure of wages changes.

Generative AI has entered graduate-heavy professions at an unprecedented rate, even in areas thought to be safe from automation. Though the short-term effects on wages are statistically indistinguishable from zero at the occupation level, technological progress is rarely visible in the immediate macroeconomic earnings figures.

If productivity is indeed driven by AI in the long run, the returns to complementary skills such as judgment, strategy, and coordination may increase. On the other hand, if analytical work is increasingly automated, potential pressure may arise first through hiring patterns and internal wage differentials before it is visible across a much larger horizon



Who Fills the Gaps in Lending When Monetary Policy Tightens? (2007-2013)

by Deniz Cicek

Introduction

Monetary tightening is often thought to be shifting lending activity away from banks and toward alternative financial intermediaries. Policy rates rising and/or credit standards tightening may decrease bank lending, potentially allowing for changes in credit composition via non-bank lenders. Post-Covid, the Bank of England (BoE) raised the Bank Rate from near the Zero Lower Bound (ZLB) to 5.25 percent, its highest level since before the Global Financial Crisis (GFC). This tightening cycle provides a setting to examine credit composition response mechanisms to policy shocks.

This article aims to find evidence and discuss whether short-run lending tightening shocks have significant effects on share of lending provided by non-bank institutions in the UK using quarterly data from 2007 to 2023. Credit composition appears highly persistent and evolves gradually rather than responsive to short-term changes. Results suggest that long-run structural forces, especially post-GFC regulatory reforms, play a more important role than short-run monetary tightening in shaping the UK credit landscape.

Economic Framework

In building the analysis regarding credit composition structures, I utilise two main economic frameworks as a basis. I will be mentioning the credit channel of monetary policy transmission by Bernanke and Gertler in 1995 with the bank capital channel work of Van den Heuvel in 2002. The second framework is the structural differences in financial systems by Allen and Gale in 2000.

Bernanke and Gertler formalise how credit frictions amplify monetary transmission through bank-dependent borrowers. Policy tightening raises funding costs and constraints regarding capital can become more binding, reducing banks' ability to expand balance sheets, requiring other intermediaries to step in. Further, Van den Heuvel shows that tighter monetary conditions can limit lending, specifically in capital-intensive banking systems like the UK, when capital requirements bind. This means monetary

tightening may reduce bank credit growth, creating space for others.

Allen and Gale on the other hand, argue that institutional structure shapes credit flows. After the GFC, non-bank intermediation expanded especially through securitised and shadow banking channels. With Basel III capital and liquidity reforms changing bank lending capacity, I use this framework as institutional changes post-GFC affecting credit flows, creating a financial system with more availability for non-bank lending in the UK. This framework also proposes a possibility of credit composition changes reflecting more long-term structural changes than short-run responses to tightening shocks.

Data and Methodology

The analysis uses quarterly UK data from 2007 Q2 until 2023 Q2. The dependent variable, NonBankShare, measures the proportion of total corporate lending provided by non-bank financial intermediaries relative to total lending. I construct this variable using Office for National Statistics (ONS) Flow of Funds data. Monetary tightening, variable NetTightening, is measured using BoE's Credit Conditions Survey net percentage balance for the availability of credit to corporates. To account for structural shifts in the monetary and regulatory environment, a post-2016 regime dummy is included accounting for the ZLB and post-ZLB eras. Given a strong persistence in credit composition, the main specification employs a dynamic model with a lagged dependent variable and heteroskedasticity and autocorrelation-consistent (HAC) standard errors.

All variables are seasonally adjusted where applicable and ordered chronologically. The inclusion of the lagged dependent variable captures path dependence in credit shares, while HAC standard errors ensure robust statistical inference.

Though the Bank Rate₈, real GDP growth, and bond yield data were included in the initial specification, they are not included in the final model due to lack of explanation of the dependent variable. Unused

specifications can be found in the appendix.

Results and Discussion

The dynamic HAC regression indicates that

$$\begin{aligned}
 NonBankShare_t &= \alpha + \rho NonBankShare_{t-1} + \beta_1 NetTightening_t + \beta_2 Post2016_t \\
 &+ \beta_3 (NetTightening_t \times Post2016_t) + \varepsilon_t
 \end{aligned}$$

NonBankShare is highly persistent, with the lagged dependent variable statistically significant and explaining the majority of the variation. This suggests that credit composition has gradual adjustment and has strong path dependence.

Once persistence is accounted for as necessary, seen in Figure 1, neither NetTightening or its interaction with the regime dummy is statistically significant. These findings imply that quarterly tightening shocks do not create shifts toward non-bank intermediation in credit composition mechanically, illustrated in Table 1.

Earlier level regressions without dynamics did suggest some apparent relationships, however, they were driven by serial correlation, as seen by low Durbin-Watson statistics. The short-run tightening narrative weakens substantially when autocorrelation

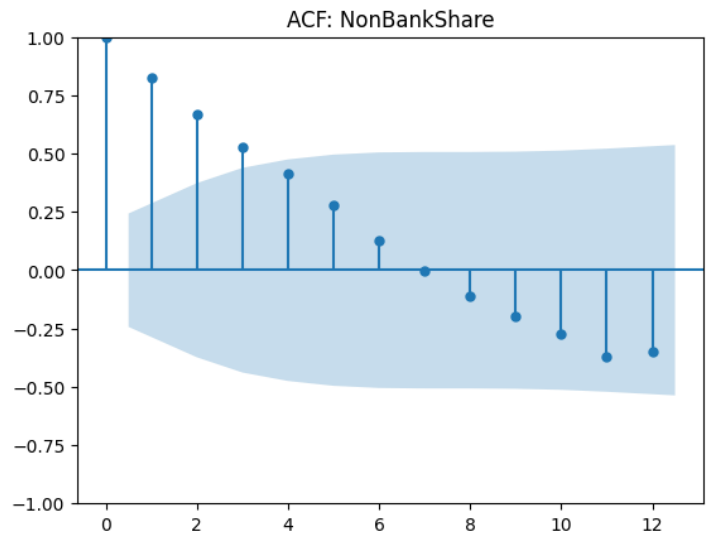


Figure 1 - Autocorrelation function plot for NonBankShare

OLS Regression Results						
Dep. Variable:	NonBankShare	R-squared:	0.792			
Model:	OLS	Adj. R-squared:	0.778			
Method:	Least Squares	F-statistic:	168.0			
Date:	Sun, 15 Feb 2026	Prob (F-statistic):	7.72e-31			
Time:	21:46:14	Log-Likelihood:	228.27			
No. Observations:	62	AIC:	-446.5			
Df Residuals:	57	BIC:	-435.9			
Df Model:	4					
Covariance Type:	HAC					
	coef	std err	t	P> t	[0.025	0.975]
Intercept	0.0475	0.016	3.017	0.004	0.016	0.079
NBS_lag1	0.7765	0.076	10.249	0.000	0.625	0.928
NetTightening	-0.0001	0.000	-0.804	0.425	-0.000	0.000
Post2016	0.0004	0.002	0.242	0.810	-0.003	0.004
NetTightening:Post2016	0.0002	0.000	1.356	0.181	-8.34e-05	0.000
Omnibus:	61.793	Durbin-Watson:	1.933			
Prob(Omnibus):	0.000	Jarque-Bera (JB):	467.109			
Skew:	-2.702	Prob(JB):	3.70e-102			
Kurtosis:	15.314	Cond. No.	1.42e+03			

Table 1 - Dynamic HAC Regression

is corrected along with incorporated persistence.

The evidence supports a more structural interpretation, like the suggested relationship in the financial systems framework. Post-crisis regulatory reforms, particularly Basel III standards, may have changed bank balance sheet behavior over time due to lower availability of high leverage, high lending behavior. Shadow banking and market-based finance showed expansion in a broader transformation in financial intermediation as argued by Adrian and Ashcraft. These are gradual developments that evolved over years rather than short-term responses to tightening quarters.

Then how has private credit boomed since 2021 and why do many private market-based financial firms see such an opportunity in non-bank lending to corporates? The AUM of private credit assets is expected to double by the year 2030 from about \$2.28 trillion in 2025. This analysis allows us to see that this growing market has been shaping for years with changing conditions in market-based financial systems.

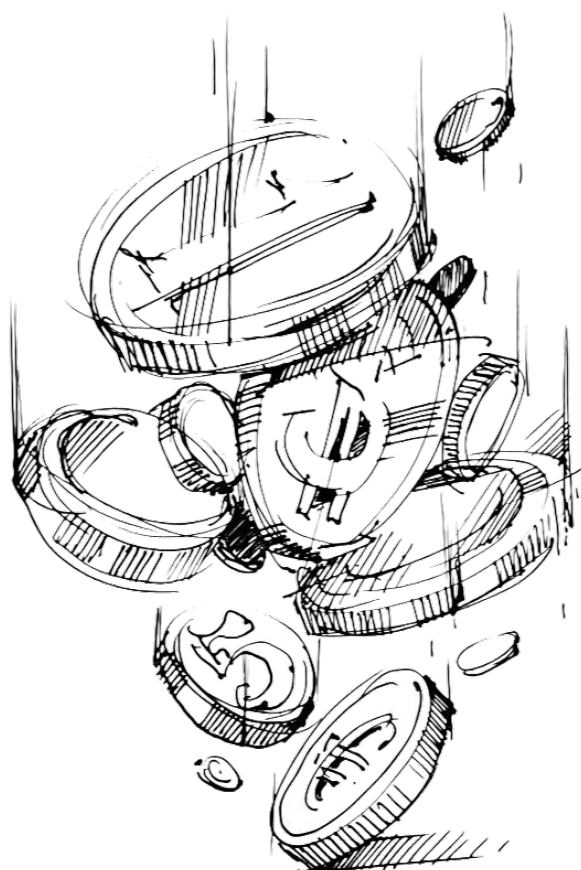
The absence of short-run substitution does not contradict the rise of private credit when the data and economic frameworks are connected. Rather, it indicates that the cumulation of regulatory, and institutional changes gradually shifted incentives toward more market-based intermediation in lending.

Conclusion

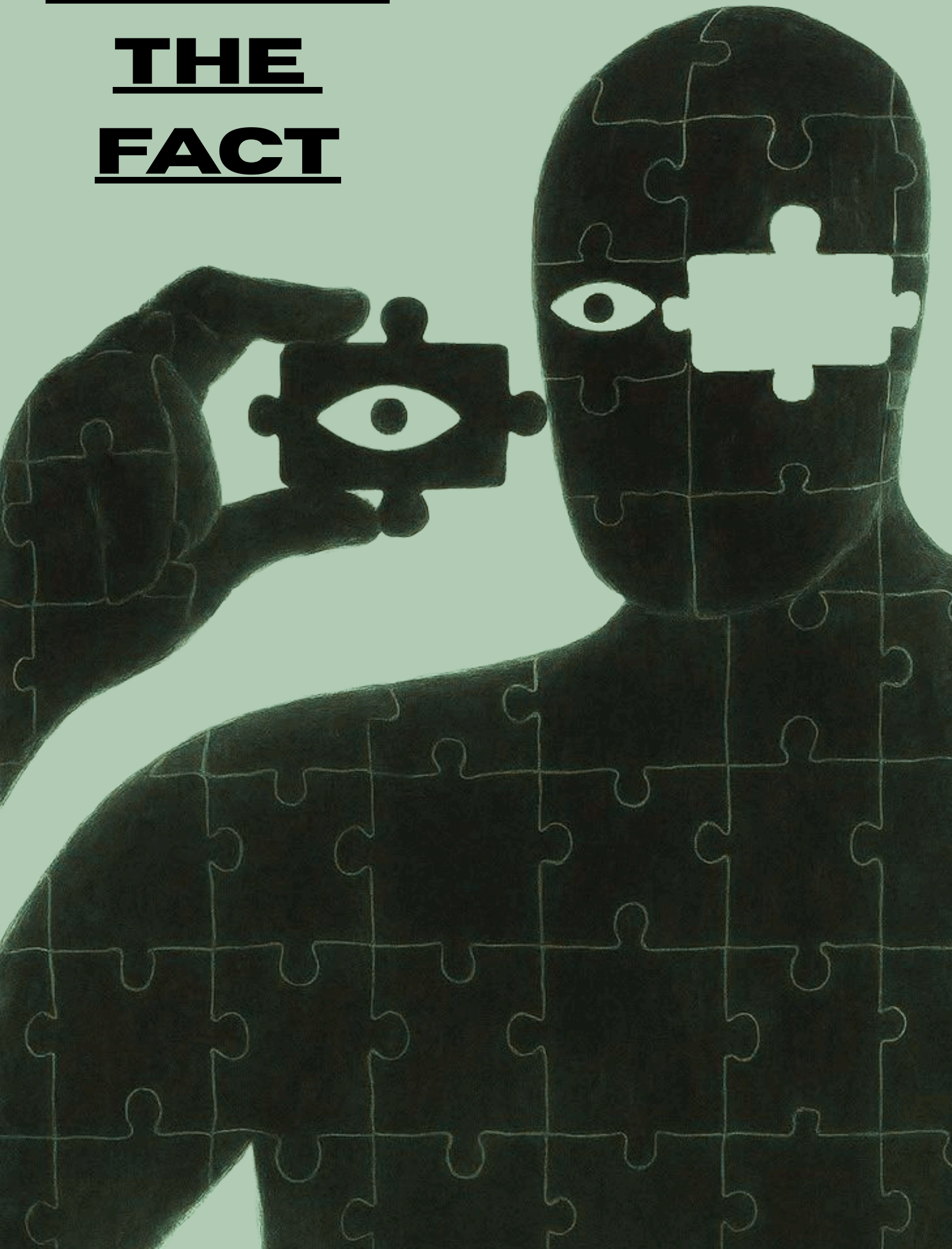
This article examines whether monetary tightening shifts lending toward non-bank financial intermediaries in the UK. Using quarterly data from 2007 to 2023 and dynamic regression methods, it does not find significant evidence that short-run tightening shocks have major effects on credit composition. Rather, NonBankShare shows strong persistence, suggesting stronger structural forces than short-run cyclical movements.

Findings point toward long-run institutional change, regulatory reform, and financial innovation in alternative investments as primary drivers of credit composition changes. Credit structure seems to adjust gradually as financial institutions adapt to evolving environments rather than responding directly to tightening episodes.

Speculation can be made regarding why structural changes over the past decade affecting credit composition have come to fruition only in the past few years. However, without primary-data driven research with direct balance sheet analysis, such speculations will be filled with confounding variables and lacking explanation of macroeconomic phenomena.



AFTER
THE
FACT



Currencies without Cargo: When Capital Flows Replaced Trade

by Amba Arjun

For generations, exchange rates were taught as the economy's automatic stabiliser: countries that imported more than they exported would see their currency weaken until the balance returned.

This describes a beautifully self-correcting system.

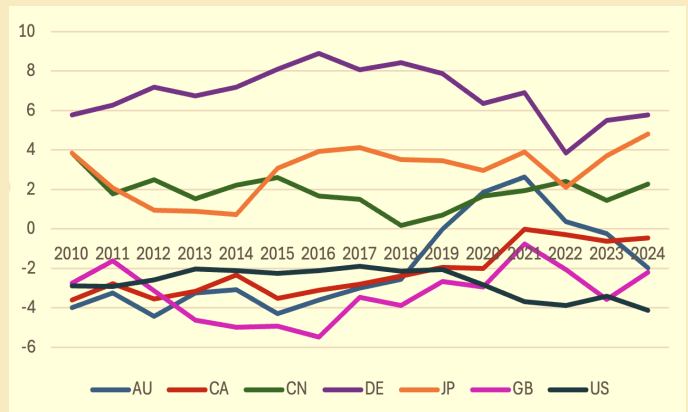
And it increasingly describes a world that no longer exists.

The United States consistently imports more goods, services and capital than it exports. Even after narrowing in the third quarter of 2025, its deficit still remained significantly large at roughly \$226 billion, and over 2024 it widened to about \$1.13 trillion (close to 4% of GDP). Despite this, the dollar remains one of the world's most widely held currencies, central to global trade, invoicing, reserves and financial markets. However, it has softened recently as investors anticipate lower interest rates and easing inflation pressures, and improving risk sentiment. Yet this weakness has not amounted to a collapse. The dollar remains historically elevated and continues to attract safe-haven flows during periods of global uncertainty. This coexistence of persistent deficits and enduring strength presents a puzzle: exchange rates increasingly appear driven by capital flows and asset demands rather than trade balances.

The Classical Hypothesis: Before Capital Took Over

The textbook story offers a clear benchmark. Floating exchange rates are meant to police external imbalances: countries that persistently buy more from other economies than they sell should see their currencies depreciate, while surplus economies experience appreciation. The mechanism is intuitive. Paying for imports requires foreign currency, placing steady downward pressure on the domestic one. Depreciation then restores competitiveness as exports become cheaper, imports become more expensive and the trade gap narrows without government intervention. In this view, exchange rates act as the automatic stabiliser as they quietly guide economies

back towards balance. The empirical prediction is therefore simple: over time, deficit countries should have weaker currencies than surplus countries. The question is not whether this logic is elegant, it is whether it still describes reality in a financially integrated world.



Using data from The World Bank, Chart 1 captures the striking pattern of average current account positions across major economies. Germany and Japan maintain stable surpluses throughout the period, while the United States and United Kingdom remain structurally in deficit. Australia and Canada oscillate but rarely reverse position for long. The key insight is persistence: external imbalances do not naturally converge towards zero, setting up the classical prediction that exchange rates should adjust to restore balance.

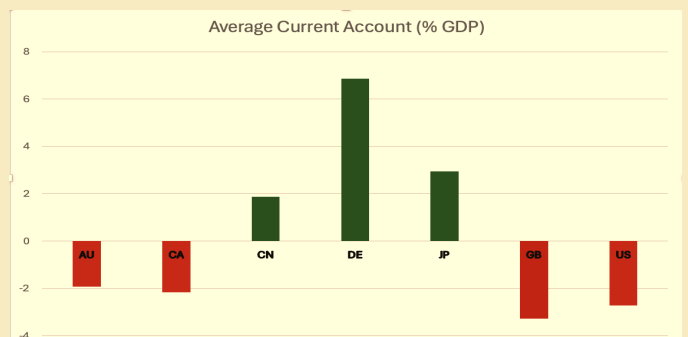
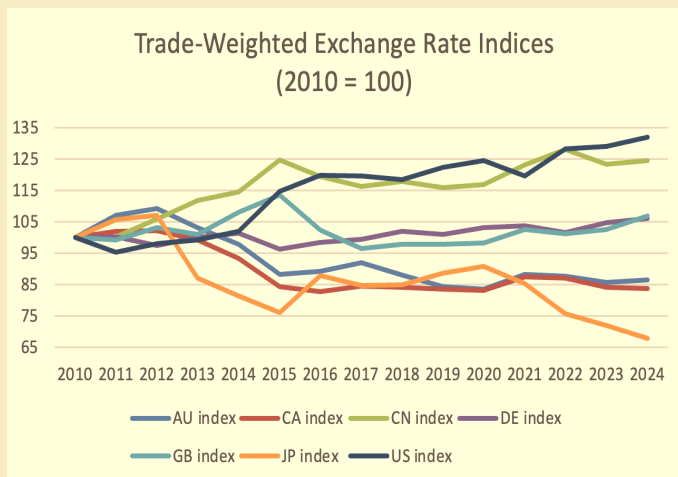


Chart 2 hence summarises these patterns over the 2010-2024 period. The imbalance is systematic rather than cyclical. If classical adjustment holds, these averages must map directly onto currency



Yet, Chart 3 uses Effective Exchange Rate (EER) data from The BIS Data Portal to contradict this prediction. The US dollar trended upwards despite persistent deficits while the Japanese Yen weakened even with surpluses. Other currencies moved largely sideways. Exchange rates fluctuate, but not in proportion to external balances, suggesting forces beyond trade, particularly financial conditions, dominate long run currency behaviour.

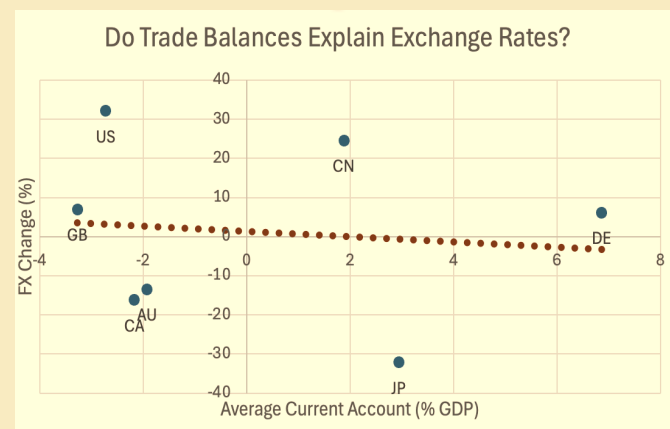


Chart 4 directly tests the classical prediction through a scatter plot. If trade balances drove exchange rates, deficit countries would cluster with depreciation and surplus countries with appreciation, forming an upward-sloping relationship. Instead, the relationship is weak and dispersed. The US Dollar appreciates despite deficits and the Japanese Yen depreciates despite surpluses while the others scatter around zero. The near-flat line suggests that external balances explain little of long-run currency behaviour in modern economies.

Why the Link Broke

The weakening relationship between trade balances and exchange rates reflects a deeper shift in what currencies now price. First, capital flows increasingly dominate trade flows. Global financial transactions dwarf the value of goods crossing borders, so exchange rates react more to portfolio allocation than import demand. A country attracting investment inflows can sustain external deficits because it effectively exports financial assets instead of merchandise. The exchange rate therefore adjusts to capital movements rather than trade imbalances.

Second, the rise of safe-haven currencies alters adjustment dynamics. The US dollar, Swiss franc and Japanese yen often strengthen during risk-off periods regardless of their countries' external positions. Investors demand liquidity and security, not export competitiveness, causing currencies to gain even when trade fundamentals suggest depreciation.

Finally, asset attractiveness now matters more than goods trade. Deep financial markets, credible institutions and legal protections increase global demand for domestic securities. Exchange rates increasingly reflect the desirability of holding a nation's assets rather than purchasing its exports. Together, these forces mean currencies no longer primarily equilibrate trade flows, they equilibrate global portfolios.

The Missing Mechanism: The NIIP Identity

The decisive break from the classical story appears on the international balance sheet. A country's external position evolves according to:

$$NIIP_t = NIIP_{t-1} + CA_t + \text{Valuation Effects}_t$$

The net international investment position (NIIP) measures a nation's external wealth which is the difference between what it owns abroad and what foreigners own domestically. Traditional adjustment logic assumes the valuation term, which represents changes in a country's external wealth due to movements in asset prices or exchange rates rather than trade, is small. Persistent current account (CA)

deficits therefore accumulate foreign liabilities until the currency must depreciate to restore sustainability. For the United States, however, valuation effects are large. Unlike most countries, the United States borrows in its own currency but invests abroad in foreign-currency assets. As documented by Gourinchas and Rey (2007), this asymmetry generates valuation gains when the dollar depreciates, stabilising the external balance sheet despite persistent deficits.

In effect:

$$\text{Valuation Effects} \approx - \text{Current Account Deficit}$$

The balance sheet stabilises without requiring exchange-rate depreciation. Adjustment occurs through capital gains rather than trade flows. The exchange rate therefore no longer acts primarily as a mechanism correcting goods imbalances, it reallocates wealth across international portfolios.

Steering Without the Old Compass

If exchange rates now respond primarily to capital flows rather than trade balances, policy priorities shift accordingly. Authorities can no longer rely on currency depreciation to correct external deficits; instead, markets react to interest-rate expectations, risk sentiment, and institutional credibility. Recent periods of pressure on the dollar, despite official commitments to a “strong dollar,” illustrate this tension: governments must balance domestic objectives such as growth and inflation against the need to maintain investor confidence.

For reserve-currency issuers, credible macroeconomic policy and stable financial institutions remain essential to prevent destabilising capital flight. Exchange-rate stability depends less on trade competitiveness and more on the perceived safety of domestic assets. Meanwhile, surplus economies face the opposite challenge as persistent appreciation can suppress inflation and weaken export sectors, sometimes requiring monetary accommodation.

Finally, the trend toward de-dollarisation and reserve diversification, exemplified by calls for the renminbi’s internationalisation, highlights the need for coordinated frameworks to manage exchange-rate spillovers and global capital flows.

Pricing Confidence, Not Cargo

The evidence suggests a clear shift in how currencies behave. In advanced, financially integrated economies, trade balances no longer provide a reliable guide to exchange-rate movements. The relationship between current-account positions and long-run currency performance is weak, while links to capital flows, risk sentiment and asset-market conditions are far stronger. Exchange rates now respond primarily to portfolio allocation and financial confidence rather than the balance of exports and imports.

Understanding currencies therefore requires a different lens: less attention to goods crossing borders and more to capital seeking safety and return. Today’s exchange rates are written in the language of capital, not cargo. The value of a currency is no longer a mirror of what a nation sells, but of how much the world trusts it as it is priced less in shipping containers and more in confidence.



Is the Petrodollar Era Ending?

by Matteo Zibordi

In 2023, a Chinese state energy company purchased liquefied natural gas from the UAE, not in dollars but in yuan. The transaction was small. The signal it sent was not. It was one of the first times a Gulf producer settled an energy deal in China's currency through the Shanghai Petroleum and Natural Gas Exchange, bypassing the dollar-clearing infrastructure that has anchored global oil markets since the Nixon era.

The deal did not mark the sudden end of an era. But it unfolded at a moment of mounting pressure on what until recently had seemed an immovable system: the petrodollar.

How Oil Cemented Dollar Power

The petrodollar system emerged from a geopolitical arrangement struck in the early 1970s, after President Nixon suspended the dollar's convertibility into gold and formalised the collapse of the Bretton Woods system. The United States needed a new anchor for international dollar demand. It found one in oil.

Beginning in 1973, the United States reached strategic agreements with major oil producers, most critically Saudi Arabia, under which crude oil would be priced and traded in U.S. dollars. Other OPEC members soon followed. The consequences were far-reaching. Countries needed dollars in order to buy oil. Oil producers accumulated those dollars and reinvested them in U.S. Treasury securities. This deepened American capital markets and kept borrowing costs low, allowing the United States to run persistent trade deficits without triggering the balance-of-payments crises that plagued other economies.

In return, Saudi Arabia received security guarantees and American military support. The structural benefits to the United States were immense. Beyond economics, dollar centrality enhanced geopolitical leverage, as global payments and financial flows passed through dollar-based infrastructure.

Why the Old Order Is Being Tested

Three forces are now testing the durability of this system. The first is sanctions. When Western governments froze approximately \$300 billion in Russian foreign exchange reserves in 2022, the message to every other country holding dollar assets was clear: access to those reserves depends on political decisions made in Washington. For countries that fear becoming potential targets, or simply wish to reduce that risk, it was a clarifying moment.

The second is the shifting geography of energy production itself. The United States, transformed by the shale revolution, is now the world's largest oil producer and a net exporter. Its strategic dependence on Middle Eastern oil has diminished sharply. China, by contrast, has become Saudi Arabia's single largest customer, absorbing more than one-fifth of the kingdom's exports. Trade flows are reshaping political alignments.

The third force is structural. Oil itself is less central to the global economy than it was in 1973. Services, technology, and digital finance account for a growing share of global value creation. The commodity that once anchored an entire monetary order no longer occupies the same commanding position. The petrodollar system was built for an industrial world that is steadily evolving.



Building an Alternative to the Dollar

China has pursued renminbi internationalisation strategically. Bilateral currency swap lines now extend to dozens of countries. The Cross-Border Interbank Payment System offers an alternative to the dollar-based SWIFT infrastructure. China's participation in mBridge, a central bank digital currency project involving the UAE, Hong Kong, and Thailand, points to a longer-term ambition: building payment channels that do not rely on U.S.-dominated financial infrastructure.

Russia, cut off from Western systems, now conducts much of its oil trade with China in renminbi and rubles. Iraq allowed trade settlement with China in yuan for the first time in 2023. These shifts are real, but their scale remains modest. The renminbi still accounts for only a small share of global foreign exchange reserves and cross-border transactions compared with the dollar's dominant position.

The constraints are structural, not merely political. The dollar's primacy rests on foundations that no other country can yet match: the depth and liquidity of U.S. financial markets, the vast stock of Treasury securities available as safe assets, and the rule of law and open capital account that allow investors to move funds freely. The renminbi, by contrast, operates within a partially closed financial system under significant state control. Countries may seek to diversify away from dollar exposure, but in moments of stress they continue to rely on dollar markets for liquidity and stability.

A More Fragmented Future

The most plausible outcome is gradual fragmentation rather than outright replacement.

Settlement patterns are becoming more regionally differentiated. Bilateral energy deals in non-dollar currencies are likely to increase. U.S. sanctions may become marginally less effective as alternative payment channels expand. The global monetary system could grow more multipolar in practice, even as the dollar retains its commanding position in reserves, trade invoicing, and international finance.

Saudi Arabia's position is perhaps the clearest indicator. Riyadh has not abandoned the petrodollar; it still prices oil in dollars and holds vast reserves in U.S.

assets. But it has joined BRICS initiatives, deepened ties with Beijing, and explored alternative payment infrastructure. The kingdom that helped entrench the petrodollar in 1973 now has enough strategic options to hedge its alignment with Washington.

For the United States, this points to a gradual narrowing of what has been called the "exorbitant privilege", the ability to borrow cheaply and sustain external deficits because global demand for dollars remains structurally high. That privilege will not disappear overnight. But in a world where alternatives exist, even at the margins, maintaining dollar centrality may become more costly.

The petrodollar system is not collapsing; it is being diluted. Recent U.S. moves in Venezuela, tightening control over crude production and exports, demonstrate that American leverage over energy markets remains significant. The dollar's foundations remain stronger than any rival's, but its exclusivity is eroding at the edges. What is emerging is not a new monetary hegemon, but a more competitive monetary order. The era of unquestioned dollar dominance is giving way to one in which that dominance must be defended rather than assumed.



How Will the “Mother of All Deals” Impact the World Around Us?

by Saksham Verma

Introduction to the trade deal

In Davos 2026, the EU and India signed a free trade deal. European Commission President Ursula von der Leyen described this as the “mother of all deals”, but is this really the case?

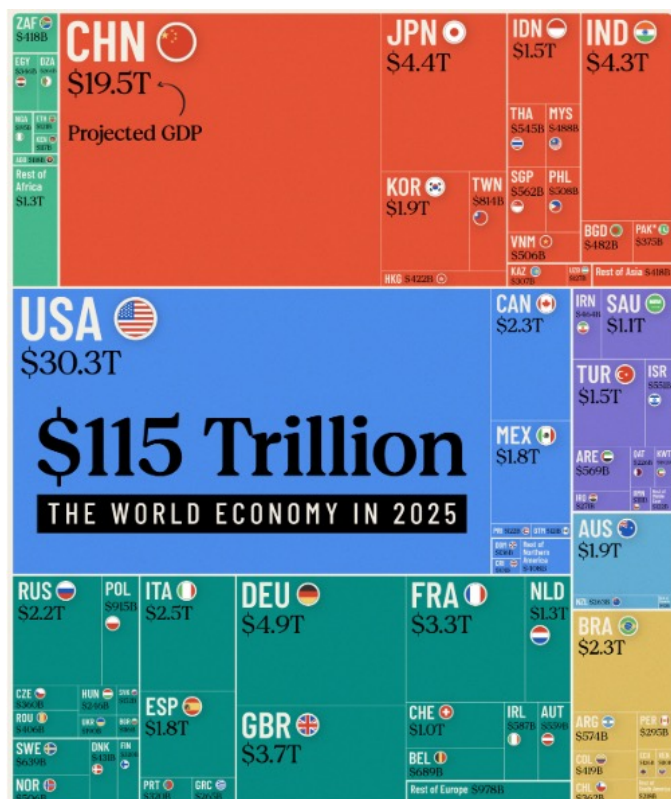


Figure 1: Chart of country GDP in proportion to the world

As can be seen in the chart above, this ambitious deal by two economic power houses represents almost 25% of Global GDP, and impacts roughly two billion people. As both India and the EU strive to reduce or eliminate tariffs on almost every good traded, it is to be noted that the deal is still being reviewed by EU institutions and undergoing a legal vetting process in India, expected to be completed by the end of this year.

Why now?

Yet, despite the sheer magnitude of this deal, another piece of information is perhaps even more interesting - the timing. India and the EU have been undergoing

negotiations since 2007 and have always been at a standstill due to regulatory standards, market access, and political disagreements. Hence, the fact that the deal came at a time of rising economic and geopolitical uncertainty, highlights the fragile situation of the world we currently live in (more specifically, the rise of protectionism in the US during the second Trump administration). With tariff uncertainty fueling geopolitics almost daily, the general view of the United States as a stable long term trading partner has reduced. This incentivizes both the EU and India to find other trading partners and diversify, which is a key proponent into why a deal that never happened for almost two decades just came to fruition.

However, this deal has a global impact beyond the two signatories. Other major global powers like China will face further trade diversion as EU and India trade relations grow stronger, all while the UK’s free trade deal with India in July of last year is now upstaged, and threatens their trade balance. Overall, this free trade agreement strengthens stability for the two economic blocks but otherwise showcases the fragmented global outlook the world faces today.

Impact of this deal on the EU

Looking through the specifics of this deal, the EU trade with India directly addresses the need for the EU to diversify its trading partners. Currently, a significant amount of the EU’s trade is concentrated with just three countries: the US, China and the UK (as shown in Figure 2).

Given China’s economic slowdown, and a Trump-led States not being a reliable trading partner, India’s predicted growth rise gives the EU access to one of the fastest growing large consumer markets in the world (as shown in Figure 3).



Figure 2: EU Trading Partners



Figure 3: Highest projected growth countries

European manufacturers - particularly in automotive, machinery, chemicals and pharmaceuticals - stand to benefit most from the deal’s tariff reductions. With India committing to reduce or eliminate tariffs on nearly 97% of goods over the next decade, one of the most significant shifts will be in the automotive sector, where India’s historically prohibitive tariff rate of around 110% is set to drop to 40% immediately. This gives European carmakers a rare foothold in a long-protected market. Beyond manufacturing, EU firms in professional services, technology and education are also poised to gain from improved market access and closer regulatory cooperation.

Viewing this deal through a political lens, the deal reinforces the EU’s strategic autonomy, reducing its

reliance on other global superpowers by strengthening ties with India. The deal also helps the EU with its ambition to position itself as a champion of free trade at a time when multilateralism is under strain.

Impact of this deal on the India

It is worth noting that trade liberalisation inherently produces winners and losers. The gains European firms make in sectors where they gain greater access will come at a cost to Indian domestic producers, who will now face heightened competition and likely pressure on their revenues and profit margins. The same logic applies in reverse - in the sectors where India stands to benefit, it is European producers who will feel the competitive squeeze.

For India, the agreement delivers both immediate economic gains and longer-term strategic advantages. With the EU committing to reduce or eliminate tariffs on 99% of Indian goods over the next decade, the deal offers a timely counterweight to the damage inflicted by Trump’s tariffs, which hit India’s labour-intensive industries - textiles, apparel, leather goods, jewellery and footwear - particularly hard. Preferential access to one of the world’s largest high-income consumer markets helps offset those losses and opens new avenues for export growth. Equally significant is the improved access to EU services markets, particularly in IT, professional services and education - areas that closely align with India’s comparative advantages in skilled labour and human capital.

Moreover, beyond just the balance of trade, this deal is likely to increase European foreign direct investment (FDI) into India, supporting technology transfer and industrial upgrading. This FDI would build on from companies like Airbus, which sources over €1 billion annually in components and services from India and works with more than 100 Indian suppliers. Likewise, Siemens has also deepened its long-term commitment to India through a €2.1 billion investment to gain an 18% stake in Siemens Ltd.

With FDI already flowing to India from the EU in recent years, this FTA serves to accelerate this trend. This helps India’s development strategy of being further integrated in the global value and supply chains.

As with the EU, India also has reduced dependency on specific trading partners like the US and China (as shown below).

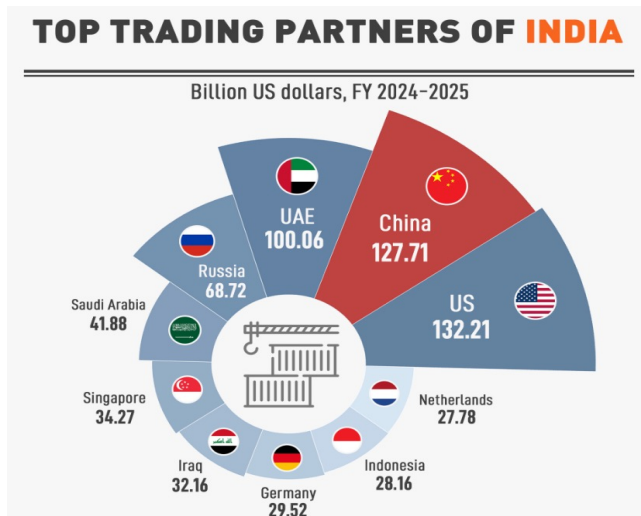


Figure 4: India’s Trading Partners

Politically, deeper alignment with the EU also helps India maintain its carefully balanced foreign policy and its overall strategic autonomy amidst the chaos in global trade today.

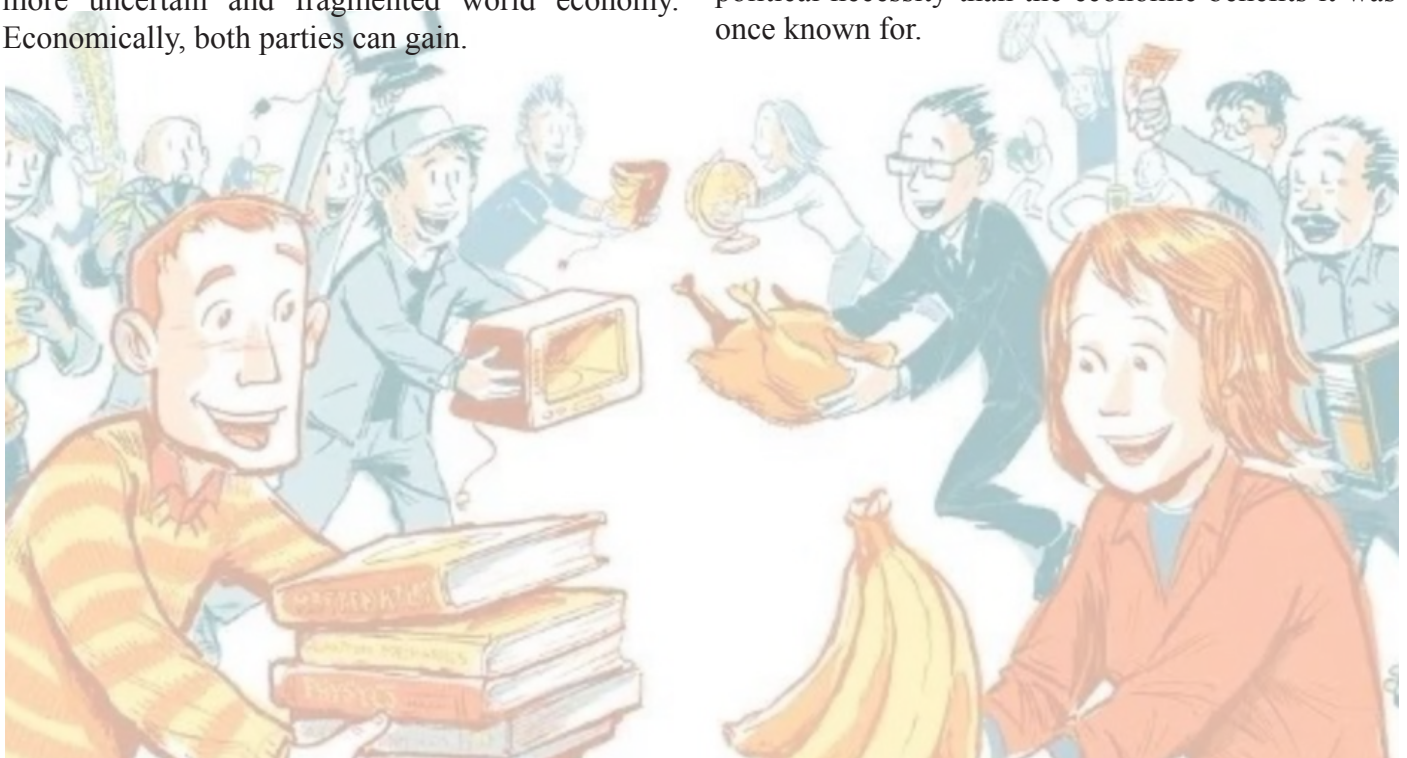
Conclusion

Overall, the EU–India free trade agreement is best characterised as a pragmatic response to a more uncertain and fragmented world economy. Economically, both parties can gain.

Firstly, the EU secures access to a rapidly growing market while reducing dependence on volatile trading partners, and India benefits from expanded export opportunities, investment inflows and deeper integration into global value chains. However, these gains are likely to be uneven and almost impossible to predict the true benefits when accounting for adjustment costs, regulatory frictions and domestic political resistance likely to persist on both sides.

Geopolitically, the agreement signals a clear strengthening of EU–India relations. It serves as a trend and political shift towards large regional partnerships as substitutes for weakening multilateral institutions. While this deal does not yet constitute the emergence of a new global economic trading bloc, it does reflect a scenario where a convergence of common interests between two economic actors strive to seek greater strategic autonomy in an increasingly polarised world. The deal also has wider implications as major parties like China, the UK and the US, risk losing trade with its largest trade partners.

To conclude, it seems like the “mother of all deals” is as much a response to global disruption as to economic ambition. This deal is a great illustration on how trade is being reshaped, with countries striking more and more free trade agreements instead of multilateral trade that once dominated globalisation. For now, it seems like trade deals are being driven more for political necessity than the economic benefits it was once known for.



Carbon Border Adjustment Mechanism: The Making of a New Trade War

by Janice Goh

On 1 January 2026, the European Union's Carbon Border Adjustment Mechanism (CBAM) entered into full force, marking a new phase in global climate governance. Framed as a necessary extension of the EU's Emissions Trading System (ETS), CBAM seeks to prevent carbon leakage and preserve industrial competitiveness by taxing the embedded emissions of imported goods. Yet beyond its environmental justification lies a deeper political reality: CBAM represents the extraterritorial projection of European climate standards onto global trade. In doing so, it risks reframing climate cooperation as climate confrontation. While designed to equalise the playing field, CBAM may instead ignite retaliatory tariffs, exacerbate geopolitical tensions, and strain relations between the EU and emerging economies.

Demystifying CBAM

Under ETS, which operates as a "cap-and-trade" carbon market, the EU has limited sectors' total pollution output since 2005 with the intention of decreasing it annually to achieve climate goals. Should a polluter firm intend to exceed the pollution quota, it would have to purchase additional allowances. Attaching a direct financial cost to pollution is intended to increase production costs for carbon inefficient/high-polluting firms. In theory, pricing emissions incentivises firms to innovate and transition towards cleaner production.

Yet, the ETS creates a structural vulnerability – carbon leakage. As carbon-intensive industries face rising compliance costs within the EU, firms may relocate production to jurisdictions with looser environmental regulations. Rather than reducing global emissions, production – and its associated carbon output – is simply displaced. An OECD study on the aluminium, cement, and steel sectors revealed that carbon leakages offset approximately 13% of emission reductions from carbon policy. Beyond environmental inefficiency, the European economy is undermined by reduced economic growth and trade losses. As foreign production costs are relatively lower, companies move production to more

competitive countries. Moreover, European countries would have to rely on importing products previously manufactured domestically from countries with cheaper production, worsening the trade balance.

Recognizing such drawbacks, the CBAM was introduced to close such loopholes. Fundamentally, the CBAM is a trade policy designed to impose a fee on imported goods, based on their carbon intensity. To put into perspective, when a European firm wants to import carbon-intensive goods such as fertilisers, they have to declare the embedded emissions – how much carbon was emitted during the production – and purchase certificates pegged to the ETS price. Effectively, the EU extends its carbon pricing regime to foreign producers – a tonne of carbon emitted in Beijing is thus priced equivalently to one emitted in Berlin. In principle, this neutralises the cost advantage of high-carbon imports and levels the playing field for domestic and foreign manufacturers.

However, while targeting the trade balance, the CBAM inadvertently introduces domestic and internal economic ramifications.

Rising Costs

By attaching a carbon levy to imports, CBAM increases the cost base of carbon-intensive goods entering the European market. In practice, these additional costs are passed along supply chains and ultimately reflected in consumer prices. Domestic producers operating under the ETS face similar pressures when purchasing emission allowances, creating cumulative cost effects across both imported and locally manufactured goods.

While CBAM is limited to specific sectors, the goods affected – such as steel, cement, fertilisers, and aluminum – are commodities that form the backbone of industrial production. Rising input costs in these sectors can cascade through construction, manufacturing, and food, ultimately contributing to broader price inflation.

Without compensatory measures, CBAM may disproportionately affect lower- and middle-income households, worsening existing economic inequality.

Inviting Retaliation by Other Countries

By imposing carbon tariffs on imports, CBAM can be framed as green protectionism by trading partners. In a bid to protect their domestic economies and signal resistance to perceived unilateral regulatory overreach, non-European countries may impose retaliatory tariffs on European exports. India's commerce minister Piyush Goyal has warned that the country would "respond (to CBAM) with full measure" with taxes on European countries. Similar objections have been echoed by China and Brazil, reflecting deeper unease among developing economies that may normatively argue that the EU bears greater historical responsibility for climate change. This invites the subsequent introduction of additional tariffs by both European and non-European countries, parallel to the existing US-China trade war. Therefore, it is probable that a trade war is brewing between the EU and its trading partners, compromising the welfare of citizens from both countries with higher prices.

Mitigating by Redirecting Tax Revenues

Though implemented with good intentions, CBAM inadvertently creates detrimental economic impacts, locally and internationally. Nonetheless, its economic frictions do not render it inherently misguided. Rather, they reveal that carbon pricing alone is insufficient to drive structural transformation. For both CBAM and ETS to achieve environmental objectives without triggering domestic backlash and international retaliation, they must be complemented with proactive industrial policy.

Theoretically, widespread adoption of green technology would reduce firms' reliance on additional carbon allowances, lowering production costs and incentives for relocation. This addresses carbon leakages at its source, rather than merely correcting it at the border with CBAM. Yet, this remains a utopian dream. High upfront costs, technological uncertainty, and competitive pressures discourage firms from investing in low-carbon innovation.

I argue that the framework of ETS can be pivoted to

chase this "utopian" dream. Drawing on the revenue of carbon permits, the EU can divert funds to discount the costs of purchasing greener technology or develop affordable, low-carbon technology. By reducing the structural cost of decarbonisation, this shifts carbon pricing from a purely punitive mechanism to a catalytic one. Instead of merely leveling the playing field, the EU would actively reshape it.

CBAM captures the paradox of modern climate politics: it aims to advance environmental progress while protecting economic competitiveness, but this risks undermining the global cooperation needed for effective decarbonisation. If seen as protectionism rather than climate responsibility, it may deepen geopolitical divisions and trigger retaliatory trade measures. Reinvesting carbon revenues into green innovation could ease these tensions by lowering the structural cost of transition.



Fundamentals or Expectations?

Explaining Japan's Nikkei 225 Surge through Macroeconomic Evidence

by Alisa Gao

Historical Background

In the 1990s, the value of land in Japan exceeded four times of all land in the United States. At the time, many believed Tokyo to be the centre of the world and assumed that real estate prices would continue rising indefinitely. When prices rise far above their fundamentals, leaving only speculation on the surface, every apparent prosperity carries a finite lifespan, waiting for the inevitable burst. A few years later, the bubble burst: pessimism spread, stock markets panicked, and land values plummeted. Japan entered the “Lost Decades”, characterised by a deflationary mindset and prolonged economic stagnation.

Recent Revival and Research Question

Recently, Japan has begun to show signs of revival. The Nikkei225 doubled between 2023 and 2025, raising the question of whether the equity market rally reflects genuine improvements in real economic fundamentals.

To investigate the drivers of the Nikkei 225 surge, I constructed a multiple regression model. Although many factors may influence the index, the model includes four key macroeconomic variables: monthly regular salary, export revenue, the USD/JPY

exchange rate, and the 10-year Japanese government bond yield.

Monthly regular salary captures strength of domestic demand, which can support corporate revenues and valuation, while export revenue measures external demand. Yen depreciation against the US dollar primarily reflects currency translation effects rather than fundamental recovery. Meanwhile, the 10-year JGB yield serves as a proxy for monetary policy stance and market expectations. I interpret the surge in stock price to be fundamentally driven if β_1 and β_2 are positive and significant. Conversely, if β_3 and β_4 are positive and significant, expectations may dominate without corresponding improvements in real fundamentals.

Level Regression Results and Interpretations

$$\text{Nikkei } 225_t = \alpha + \beta_1 \text{ Wage}_t + \beta_2 \text{ Exports}_t + \beta_3 \text{ USD/JPY}_t + \beta_4 \text{ JGBYield}_t + \varepsilon_t$$

Between December 2020 and December 2025, the model demonstrates strong explanatory power, with an adjusted R square of 0.8512. β_1 and β_4 are positive and statistically significant, while β_2 and β_3 are negative and insignificant. This suggests that export growth and yen depreciation are not primary drivers of the Nikkei 225 surge.

Table 1. Level Regression Result

	Coefficients	Standard Error	P-value	T-statistic
β_1	0.4604	0.1180	0.000254	3.90
β_2	-0.0004	0.0005	0.443	-0.77
β_3	-12.318	39.336	0.755	-0.31
β_4	482617.43	182651.16	0.011	2.64
R Square	0.8610			
Adjusted R Square	0.8512			

Notably, the regular wage level has a p-level of 0.000258, providing very strong evidence that wage levels and the Nikkei 225 are related. The equity market recovery therefore appears closely tied to improvements in domestic income and demand rather than external factors.

The positive coefficient on bond yield suggests that rising interest rates are interpreted as monetary policy normalisation - positive signal for stronger growth expectations - rather than constraint on economic activity.

Interest Rate in Japan: A Contradiction to Conventional Theory

The relationship between interest rate and stock performance in Japan contradicts the traditional hypothesis that interest rate hikes depress equity prices. Under the conventional view, higher borrowing costs discourage investment and consumption, resulting in weaker capital expenditure and domestic demand. Reduced capital investment may worsen firms' future growth prospects and lead to a less favourable earning outlook, thereby exerting downward pressure on equity valuations. In Japan, suffering from decades of deflation, interest rate hikes can tell a very different story. The central bank, as a trusted and authoritative institution, is perceived to raise rates only when it is confident in the resilience of the economy. If policymakers tighten despite potential growth risks, such actions may signal strong domestic demand and improving economic fundamentals.

However, multicollinearity may exist between regular wage levels and JGB yields, as the central bank may respond to rising labour costs with interest rate hikes to curb inflation.

In December 2025, the BoJ raised its policy rate to 0.75%, the highest level in three decades (5). Japan's current inflation can be partly attributed to cost-push pressures arising from rising labour wages. Labour shortages have strengthened workers' bargaining power in wage negotiation, with major unions seeking wage increases exceeding 5% during the 2026 shunto. In response, the central bank raised interest rates to prevent underlying inflation, implying that interest rates may move in response to inflationary dynamics and thus affect JGB yields.

Together with the BoJ's 2024 estimate of the neutral rate at between 1% and 2.5%, these developments form a clear expectation that the bank will continue to raise policy rates and proceed with monetary policy normalisation.

Growth Rate Regression Result and Interpretations

$$rNikkei\ 225,t = \alpha + \beta_1 rWage,t + \beta_2 rExport,t + \beta_3 \Delta USD/JPYt + \beta_4 \Delta JGBYieldt + \epsilon t$$

Table 2. Growth Rate Regression Result

	Coefficients	Standard Error	P-value	T-statistic
β_1	0.3420	0.8940	0.7035	3.90
β_2	-0.0299	0.0591	0.6152	-0.51
β_3	0.2652	0.1985	0.1869	1.34
β_4	0.1737	2.2199	0.9379	0.08
R Square	0.0388			
Adjusted R Square	-0.0299			

To examine period-to-period changes, I then conduct a growth-rate regression. This specification is designed to capture short-term market responses to new information. The result from Table 2 shows that none of the variables show a statistically relationship with Nikkei 225 growth, implying that such short-run dynamics play a limited role in explaining market movements. The significance of wage levels in Table 1 therefore supports the interpretation of a structural recovery driven by domestic fundamentals rather than transient market reactions.

However, since there could be many unobservable and unquantifiable factors influencing Nikkei 225 price, like traders' psychological mindset, the regression results in Table 1 should be interpreted as evidence of structural improvement rather than a causal relationship between wage growth, JGB yields and equity prices. Expectations of a positive economic outlook arising from policy normalisation may already be priced into the market. As such, even if interest rates continue to rise, there is no guarantee that stock prices will increase, as anticipated future gains may already be reflected in current valuations.

Policy Outlook and Risks

From another perspective, although we cannot fully attribute the stock market surge to improvements in real economic fundamentals, it may reflect expectations of future prospects. The results suggest that this positive outlook is closely linked to strengthening domestic demand.

Upcoming fiscal spending packages totaling 17.7 trillion yen could further reinforce this outlook by stimulating domestic consumption. On the other hand, the market may be less responsive to external demand shocks. External risks - including potential U.S. tariff policies under the Trump administration and ongoing geopolitical tensions with China - may not immediately depress market expectations.

At the same time, concerns remain regarding fiscal sustainability. The new prime minister, Takaichi, advocates high government spending despite Japan's public debt already exceeding 230% of its GDP. Rising interest rates may significantly increase debt-serving costs, posing long-term fiscal risks that could eventually weigh on economic stability.



