

GLOBAL FINANCIAL ENGINEERING, INC.

Public Doctrine Series · The Engineered Long End — Paper III of V

The Arithmetic of Escape

Bond buybacks treat the symptom. What a credible fiscal package would actually cost — and how Washington and Tokyo could engineer their way out together

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Abstract

Papers I and II described a machine and a loop. This paper asks the only question that follows: what would it take to get out. The answer begins with a piece of arithmetic almost nobody states, and which reframes the entire debate. The United States does not have a spending problem in the ordinary sense — its primary deficit, the deficit excluding interest, runs at 2.6 percent of national output and is projected to fall to 2.1 percent over the next decade. What it has is a compounding problem. Net interest is projected to double from roughly one trillion dollars to two point one trillion by 2036, growing faster than Medicare, faster than Social Security, faster than any other line in the budget. On the desk's arithmetic from those official inputs, stabilising the debt ratio requires an adjustment of roughly one to two percent of national output each year — between three hundred and eighty and seven hundred billion dollars annually — and that figure is set almost entirely by the gap between the interest rate and the growth rate. A single hundred-basis-point repricing of the

whole stock costs about three hundred and thirty billion dollars a year, which is fifty-five times the size of the buyback operation announced this week. That ratio is the paper's central finding: buybacks and a fiscal package are not alternatives. Every basis point the long end reprices makes the package larger. This paper sets out five engineering levers, prices each, and proposes what a coordinated Washington-Tokyo structure would have to look like to be credible rather than merely reassuring.

I. A Note on Sequence

Paper II closed by announcing a different Paper III. This one has been brought forward because the question it answers — symptom against cure — is the question a reader holds after Papers I and II, and because the material is live. The paper originally numbered III, on reading a term-premium regime from a book that holds no opinion, becomes Paper IV. The register records the change rather than quietly renumbering, because a series that revises its own plan should say so.

II. The Arithmetic Nobody States

Begin with the numbers, from the Congressional Budget Office's own baseline for 2026 to 2036.

The federal deficit for fiscal 2026 is 1.9 trillion dollars, or 5.8 percent of national output. Debt held by the public stands at 101 percent of output and is projected to reach 108 percent by 2030 — surpassing the wartime record of 106 percent set in 1946 — and 120 percent by 2036. Net interest costs one trillion dollars this year, 3.3 percent of output, and are projected to reach 2.1 trillion, or 4.6 percent, by 2036.

Now the decomposition that changes the argument. The primary deficit — the deficit before any interest is paid — is 2.6 percent of output in 2026 and is projected to fall to 2.1 percent by 2036. It does not grow. What grows is the interest bill, by 106 percent over the decade, against 85 percent for Medicare and 65 percent for Social Security. Interest is already the third largest line in the federal budget, exceeding both national defence at 885 billion and Medicaid at 708 billion, and consuming roughly nineteen cents of every dollar of federal revenue.

An engineer reading that decomposition sees something specific. A system whose forcing term is stable but whose output diverges is not being driven by the forcing term. It is being driven by feedback — by the fact that debt pays interest, and interest adds to debt. The United States fiscal position is not primarily a story about spending choices. It is a story about a feedback loop whose gain is the difference between the interest rate and the growth rate.

What stabilisation actually costs

The condition for a stable debt ratio is standard and unforgiving. The primary balance must equal the debt ratio multiplied by the gap between the nominal interest rate and the nominal growth rate. Run it with the official inputs. The effective interest rate on the existing stock is about 3.0 percent — one trillion dollars of interest on thirty-three trillion of debt. Set nominal growth at four and a half percent and the sustainable primary deficit is 1.4 percent of output, against an actual 2.6: an adjustment of 1.2 percent, roughly 384 billion dollars a year. At four percent growth the required adjustment is 1.7 percent, or 541 billion. At three and a half percent it is 2.1 percent, or 699 billion.

That range — call it four hundred to seven hundred billion dollars every year, sustained — is the price of a credible fiscal package. It is not a number that any single measure reaches. It is roughly the entire defence budget, or a fifth of all federal revenue, or a permanent adjustment of about two percent of national output.

And why the buyback cannot touch it

Here is the ratio that ought to end the debate about whether buybacks are a solution. A hundred-basis-point repricing of the entire stock of debt eventually costs about 331 billion dollars a year — one percent of national output, and by itself as large as the low end of the required fiscal adjustment. The buyback operation announced this week is six billion dollars. It is under two percent of the annual cost of a single hundred-basis-point move.

The effective rate on the debt is 3.0 percent while new long issuance prices above five. That gap is not a forecast; it is a queue. As the existing low-coupon stock matures and is refinanced at current rates, the effective rate climbs toward the marginal rate whatever anyone does. The doubling of the interest bill by 2036 is that queue clearing.

III. The Five Levers, and What Each Costs

There are exactly five ways to change a debt trajectory. Every proposal ever made is one of them or a combination. Priced honestly, none is free and only one is both large enough and legitimate.

Lever one: raise growth

Increase the growth rate and the gap between interest and growth narrows or inverts. This is the only lever that costs nothing to anybody, which is why it is invoked most often and delivered least. Its honest properties: it is the largest lever available — a sustained one-point rise in nominal growth is worth roughly a point of output a year in the debt arithmetic, comparable to the entire

required adjustment — but it cannot be legislated on demand, it acts with a lag of years, and policies that claim to deliver it usually cost revenue in the interim. An engineer would call it high-gain, high-latency, and unreliable: worth pursuing, never worth relying on.

Lever two: change the primary balance

This is the credible fiscal package, and it is the only lever whose size matches the problem. Four hundred to seven hundred billion dollars a year, permanent, through some combination of revenue and spending. Its properties are the mirror image of lever one: it is fully within legislative control, it acts immediately, and its cost is entirely political. It is also the only lever that changes the structure rather than the input — and, per Paper II, a positive-feedback system is managed by changing structure. Everything else on this list buys time for this one to be enacted.

Lever three: lower the interest rate

Three routes, of decreasing legitimacy. Genuine credibility — a fiscal package announced and legislated — lowers the term premium by removing the risk it prices, and is therefore not a separate lever but a consequence of lever two. Monetary easing lowers the front end, which now matters more than it did because the debt has been shortened, but a central bank cutting to relieve a treasury is precisely the loss of independence that raises the term premium it was meant to lower. And financial repression — regulatory requirements that oblige banks or pension funds to hold government paper, caps, or sustained purchase operations — lowers the rate by removing the choice. It works. It has worked historically. It transfers the cost from the taxpayer to the saver, invisibly, and it is the lever a commentator this week described the buyback expansion as a soft form of.

Lever four: inflate

Unexpected inflation erodes the real value of fixed-rate debt already issued, and on a stock with an average maturity of several years that erosion is substantial. Its properties are the reason serious institutions do not choose it: it works exactly once, because the market reprices every subsequent issue for the risk, permanently raising the interest rate term in the very equation the inflation was meant to fix. It is a lever that consumes the machine that operates it. It is also, uniquely on this list, the option that arrives without anyone choosing it if the other four fail.

Lever five: reprofile

Extend maturities, exchange existing debt for longer or differently structured obligations, or in the extreme restructure. For a reserve-currency issuer the extreme end is not available at any price a rational government would pay,

since the value of the asset is precisely its unquestioned promise. But the mild end is available and is worth naming as the honest counterpart to what is being done now: the current programme shortens maturity, and the reprofiling lever would lengthen it. That the Treasury is at present moving in the shortening direction — bills at roughly 22.8 percent of marketable debt, above the fifteen-to-twenty percent band its own borrowing advisory committee recommends — means the reprofiling lever is currently being pulled backwards.

Lever	Size available	Latency	Who pays	Reversible
Raise growth	Very large	Years	Nobody, if achieved	n/a
Primary balance	Matches the problem	Immediate on enactment	Taxpayers and beneficiaries, explicitly	Yes
Lower the rate	Moderate to large	Fast	Savers, if by repression; credibility, if by dependence	Partly
Inflate	Large, once	Fast	Bondholders and wage-earners, invisibly	No — the rate reprices permanently
Reprofile	Moderate	Slow	Whoever accepts the new terms	Yes, at market cost

IV. Why Tokyo Cannot Simply Comply

The mirror deserves the same arithmetic, because the request being made of Japan is subject to the identical equation.

Japan carries the largest government debt ratio in the developed world, and it is held overwhelmingly at home — by its own central bank, its own insurers, its own banks and its own households. That domestic ownership is the reason the position has been sustainable for thirty years while foreign observers predicted collapse: there is no foreign creditor to lose confidence, and for most of that period the interest rate on the debt was effectively zero.

Now apply lever three in reverse. Every rise in the Japanese policy rate raises the interest term in Japan's own debt equation, on a debt ratio roughly twice the American one. A country with debt at twice output faces twice the fiscal cost per basis point. The request from Washington — communicate a path toward higher rates, and toward fiscal sustainability, at the same time — asks Tokyo to worsen the first arithmetic in the name of the second.

This is the structural symmetry the two papers before this one were building toward. Both sovereigns are constrained by the same equation. Each is being pushed toward an action that improves its counterpart's position and worsens its own. Washington wants a stronger yen and a Japanese rate rise; that thins the largest foreign bid for its own long end. Tokyo wants a stable currency and a functioning JGB market; a rate rise raises its own service costs against the developed world's heaviest debt. Neither is behaving irrationally. They are two controllers acting on one coupled system, each optimising locally.

V. What a Coordinated Structure Would Have to Contain

If the two problems are one system, the engineering response is a structure rather than a sequence of unilateral operations. Four components would be required for such a structure to be credible rather than merely reassuring, and each is testable against the arithmetic above.

First: the fiscal package must come first, and be legislated rather than announced

Nothing else on this list survives without it. A four-to-seven-hundred-billion-dollar annual adjustment, enacted with a schedule and an enforcement mechanism, does what no operation can: it removes the risk the term premium is pricing, and therefore lowers the rate through lever three by way of lever two. The order matters and is frequently reversed in practice. Support operations announced before a package are read as substitutes for it; the same operations announced after one are read as bridges to it. The market's opposite reactions on 19 August and 9 September, described in Paper I, are a small demonstration of how finely that distinction is priced.

Second: the maturity profile must be extended, not shortened

A treasury that believes its own consolidation will lower rates should be issuing long, locking in the current cost before the improvement arrives, and shortening only if it believes rates will fall for reasons it cannot influence. Current practice does the reverse: it retires long paper and funds with bills, which is the correct trade only if the long end is expected to cheapen further — a position no issuer should wish to hold about its own debt. Extending would be more expensive today and cheaper across the decade, and would reduce the coupling between the fiscal position and the policy rate that Paper I identified as the buyback's structural cost.

Third: currency stabilisation belongs in swap lines, not in policy rates

The pressure on Tokyo is, in substance, a request to use domestic monetary policy to manage a bilateral exchange rate. There is an instrument designed for that purpose and it does not touch either country's debt arithmetic: central-bank swap facilities, which address currency and dollar-funding stress directly and temporarily. Using the policy rate instead means paying for currency stability out of the fiscal position of the country asked to move — which is the loop this paper has described. Separating the currency objective from the rate objective is the single change that most directly breaks the feedback.

Fourth: the demand side must be addressed as demand, not as price

A buyback bids for paper. It does not create a holder. If the underlying problem is that the marginal buyer of long duration has withdrawn — because a hedged foreign return no longer competes with a domestic one — then the durable responses are those that restore a natural holder: instruments matched to the liabilities of pension and insurance investors, coordinated issuance calendars between the major sovereigns so that long supply does not arrive simultaneously, and a hedge-cost environment that does not tax the foreign buyer out of the market. These are unglamorous, slow, and structural. They are also the only measures on this list that address the condition rather than its price.

VI. What Would Falsify This Reading

Three observations would refute this paper, and all three are public.

If the interest bill stabilises as a share of output without any fiscal adjustment — because growth exceeds projections, or because the effective rate stops converging toward the marginal rate — then the compounding diagnosis is wrong and the problem is smaller than argued. If long yields fall materially while the primary deficit is unchanged, then credibility is not the binding constraint on the term premium and lever two is less central than claimed. And if a fiscal package of the size described is enacted and the term premium does not narrow, then the market is pricing something other than fiscal risk, and the entire framework here mistakes the variable. The measures to watch are the monthly Treasury statement, the effective rate implied by interest divided by debt, and the term premium itself.

One further caution belongs in the record. This paper describes structures and prices them; it does not recommend which to adopt, because the choice among them is a political judgement about who should bear a cost, and that judgement belongs to citizens and their representatives rather than to a financial

engineer. What an engineer can contribute is the insistence that every option be priced before it is chosen, and that an option which cannot reach the required magnitude not be described as a solution.

VII. The Executed Argument

Per the standing template of this series, the institutions' own book is reported retrospectively, in the past tense, as an exhibit and never as a template, with the paid and the unpaid given equal weight. The futures book is referred to as GATS7.

Doctrine restated

A governor that adjusts its input while the structure that generates the problem remains unchanged will be re-tuned indefinitely and never converge. The institutions' own internal law states the principle in an operational form: hold the machine still and cut only on a named defect, because a set-point moved between observations destroys the meaning of the measurement. The corollary is the subject of this paper — when a system has no negative feedback, the remedy is structural, and the cost of the structural remedy rises with every period it is deferred.

Signature observed

In the first ten days of September 2026 the institutions applied that law to their own machine. Five defects were named in the trading architecture, each with a witness in an operating log: a position-count ceiling that had been derived correctly once and then written down as a constant; a risk measure that charged positions for exposure they no longer carried; a protective structure released on a clock rather than on the condition it protected against; a capital-injection unit denominated by a table that gave two different answers for the same sum; and a hedge sized against a single position rather than the exposure it belonged to. Each was corrected at the structure, not at the input. Each correction carried a declared property and a falsifier written before it was made.

Expression

Through the same period GATS7 held a short position in FGBL_U and FGBL_Z (Euro-Bund futures) across sixteen legs and long equity-index futures in the American and European complexes. The book took no position in ZN or ZB (United States Treasury note and bond futures) and none in 6J (Japanese yen futures). On the instruments central to this paper's argument it was silent, and the argument here rests on public arithmetic rather than on an executed trade.

Consequence

Realised: a lifetime profit factor above five across one hundred and seventy-three closes with a maximum balance drawdown below one percent.

Unrealised: an equity-index complex under water and bounded by constitutional stops. The five corrections were made in two days across ten independent installations, each compiled clean and each verified by a banner line that could fail. The cost of the exercise was two days of engineering; the cost of not making it would have been an indefinite number of further re-tunings of the same constants.

Lesson banked

The most expensive number in any system is the one that was derived correctly once and then written down. It becomes invisible precisely because it was right when it was written, and it is defended by the memory of having been right. A buyback ceiling moved from two billion to four to six in three weeks is such a number being re-tuned in public; a fiscal adjustment of four to seven hundred billion dollars a year is the structure that would make the tuning unnecessary. An institution that has spent a week retiring its own tabulated constants recognises the pattern, and offers the recognition rather than the advice.

Paper IV of The Engineered Long End — Yields Rising with a Falling Dollar: Reading a Term-Premium Regime from a Book That Has No Opinion — follows.

ABOUT THE AUTHOR

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