GLOBAL FINANCIAL ENGINEERING, INC.

Immortality Under the Law

The Machine States · Paper IV · Immortality

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ABOUT THIS SERIES

The Machine States is a sub-series of the Public Doctrine Series. It sets out how the houses charter a trading machine, name the conditions of its book, and govern when income may leave it. It describes internal doctrine applied to the houses' own capital. The case in Section VII is an illustration built from operating data. Its figures have been altered and it reports no account's results.

I. A state that belongs to the law

Immunity, the subject of Paper III, is a property of the positions now open. It asks whether the capital would survive the death of every one of them, and it changes whenever a position is born, banks or moves its stop. Immortality asks a larger question, and its answer does not depend on the positions at all. It asks whether the capital would survive the death of every position the machine's law could ever permit it to hold at once.

Paper I defined the state in one inequality. A book is in Immortality when its balance, less the largest share of it that the commitment ceiling permits to be at risk, stands at or above Chartered Capital:

$$B \times (1 - c) \geq K, \quad \textit{equivalently} \quad H \geq H^* = K \times c \,/\, (1 - c)$$

Here B is the balance, c the commitment ceiling, K Chartered Capital, H the Retained Harvest and H* the Immortality Harvest, the harvest the state requires. The Immortality Multiple of Paper I is H divided by H*. This paper sets out what the state protects, how far that protection reaches, how it depends on the ceiling, how it is lost, and where its protection ends.

II. What the state protects

The meaning of the inequality is exact. Let the machine fill its book to the limit its law allows, with every position chosen as badly as possible, and let every one of them die at its stop on the same day. The balance falls by at most c × B, and in Immortality what remains is still at least K. No arrangement of positions the law admits at one time can reach the capital.

That is why the state belongs to the law rather than to the book. Immunity is earned again with every birth and can be lost by the next admission. Immortality cannot be lost by any admission the law permits, because it has already counted the worst of them. It mirrors at the level of the book what the word already means at the level of the position: a position is immortal when its stop has passed its entry and it can no longer lose; a book is immortal when the same is true of its capital, on the law's own terms.

III. How far the protection reaches

Here a correction of ordinary intuition is needed, and it is the most important result of this paper. Immortality protects the capital against one complete loss of everything the law permits. It does not protect the capital against a second.

The reason is in the arithmetic. After the worst permitted day, the balance has fallen to B × (1 − c). That is still at least K, so the capital is whole, but the harvest that made the book immortal has been spent. The book has left Immortality. Where it lands is the instructive part: with nothing open and its balance at or above K, its floor equals its balance, so it stands in Immunity. The fall is caught exactly one rung down.

From there, Paper III's ratchet takes over. A book in Immunity cannot be taken out of it by the market, only by its own admissions of new risk. Whether a second catastrophe could reach the capital is therefore decided not by Immortality but by the discipline with which the machine admits risk afterwards. Immortality is not invulnerability. It is the capital standing after the worst single book the law permits, with the next defence already in place beneath it.

The protection can be measured. Call the Immortality Depth the number of complete losses of everything the ceiling permits that the capital could absorb in succession before it is impaired:

$$\textit{Immortality Depth} \quad n^* = \ln(B / K) / \ln(1 / (1 - c))$$

Table 1. Immortality Depth by ceiling and multiple

Ceiling c	Multiple 1	Multiple 3	Multiple 10
10%	1.00	2.73	7.09
25%	1.00	2.41	5.10
50%	1.00	2.00	3.46

Arithmetic, not a forecast. A complete loss of everything the ceiling permits, all at once, is an extreme bound and not an expectation.

The table has a clean edge. At a multiple of one, the depth is exactly one at every ceiling: the threshold of Immortality is the point at which the capital survives one complete loss and no more. At the Distribution State, a multiple of three, the capital could absorb between two and three such losses in succession. That is the engineering reason the series sets the Distribution State at three and not at one. Nothing may leave a book until its capital could survive the worst permitted book at least twice over.

IV. The ceiling sets the price

The harvest Immortality requires is set entirely by the ceiling. At a ceiling of one tenth it is a ninth of Chartered Capital; at one quarter, a third; at one half, the whole of it; at a ceiling of one, it is infinite. A book permitted to risk all its balance can never be immortal, however much it earns, and the formula says so without a special rule.

This makes Immortality a joint product of the machine's earning and the house's capital law. A sound capital law lowers the ceiling as a book climbs its tiers, so the target moves toward a book as it grows. It also means that the state can be gained without any trade at all, when the house lowers a ceiling, and

lost without any trade, when the house raises one. A ceiling is a set-point, and every change to it is a change to the price of Immortality. That is a reason to change ceilings deliberately and on the record.

V. How the state is lost

There are three ways out of Immortality, and they are not alike. The first is the loss the state was built to survive: deaths large enough to consume the harvest above H*. Such a loss leaves the capital whole by construction, and, as shown above, the book falls no further than Immunity. The second is a rise in the ceiling, which raises H* beneath an unchanged harvest. The third is withdrawal. Because Chartered Capital does not fall when harvest is paid out, every withdrawal lowers the multiple directly, which is why Paper I forbids any distribution below a multiple of three and limits each distribution to the share $1 - 3/m$ of a period's harvest. Under that rule no withdrawal can take a book out of Immortality, or even out of the Distribution State.

Of the three, only the first is the market's doing, and it is the one the state was designed to absorb. The second and third are acts of the house, and the doctrine governs them in advance.

VI. Where the protection ends

Immortality is immortality under the law, and the law makes assumptions. It assumes that each stop is honoured at its price. A market that gaps through stops, a venue that fails or halts, or an instrument that ceases to trade can produce a loss larger than the ceiling admits, and against that the state offers nothing. It sits with the risk of ruin, which every capital doctrine must name and none can remove.

It also assumes that the ceiling is obeyed. If the risk at the stops were ever to exceed the ceiling, through a defect or through positions the measure did not count, the multiple would overstate the book's standing. The state is only as true as the instrument that measures the risk.

VII. The Case

The following case is an illustration built from operating data. The figures have been altered and it reports no account's results.

The book of Papers I to III is chartered at 100 units under a ceiling of one quarter. Immortality asks of it a harvest of 33.3 units. At its first reading, with a harvest of 0.4, its multiple was 0.012. Suppose it is read again much later, with a balance of 140 and a harvest of 40. Its multiple is 1.2, so it is immortal, and its Immortality Depth is 1.17.

Now let the worst happen. The law permits it a quarter of 140 at risk, 35 units. Every position is filled to that limit and every one dies on the same day. The balance falls to 105, so the capital is whole. The book has left Immortality, since its multiple is now 0.15, but with nothing open its floor is 105, and it stands in Immunity. It fell one rung and was caught.

Consider instead that the house's capital law, recognising the book's size, lowers its ceiling to one tenth. The harvest Immortality requires falls from 33.3 to 11.1, and the same harvest of 40 now gives a multiple of 3.6. The book stands in the Distribution State without a single additional trade. The ceiling sets the price of the state, and the house sets the ceiling.

VIII. What would falsify this reading

The account given here would be wrong if a book in Immortality saw its capital impaired in a single episode without a gap, a halt or a breach of its ceiling; the inequality would then not mean what this paper says it means. It would be wrong if books that fell out of Immortality routinely fell below Immunity in the same episode, for the claim that the fall is caught one rung down would fail. And it would be wrong if the risk a book actually carried were found to exceed its ceiling as a matter of course, for every multiple would then overstate. Each of these can be checked against the record of a book.

RELATED IN THE PUBLIC DOCTRINE SERIES

A Machine With a Charter: The Machine States, Paper I, which defines the states and the Immortality Multiple.

What the Open Book Carries: The Machine States, Paper II, on the ground between Under Carry and Cover.

The Floor Beneath the Book: The Machine States, Paper III, on Immunity and the floor ratchet.

ABOUT THE AUTHOR

Dr. Glen Brown is President & CEO of Global Financial Engineering, Inc. and Global Accountancy Institute, Inc. He is the architect of the GCPIAUT framework and the broader GATS-native proprietary capital doctrine. His work focuses on sovereign capital governance, algorithmic trading architecture, reserve-first compounding systems, and institutional financial engineering within closed proprietary environments.

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