Market Rate Development Risk Mitigation Method

Mass Timber Cashflow Assurance Mechanism

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Summary

Groups that want mass timber housing adopted by market-rate institutional capital have mostly subsidized construction cost in order to encourage the development of influential examples. This note describes a different method: assure a slice of a project's forecast net operating income (NOI) for its first years of operation, with partial, contingent recovery of supplemented NOI from surplus proceeds if and when a project realizes them on being sold or refinanced. The tool that carries out the method is the **Mass Timber Cashflow Assurance Mechanism**.

The method is a market intervention: a technical financial tool that responds to a technical factor, risk, which is a primary headwind for the industry. A simulation of the mechanism, available as a public interactive tool, suggests that a pledge of a scale typically seen from foundations interested in advancing the positive social externalities of mass timber's use could stand behind a meaningfully large volume of privately financed development, at an implied subsidy that is a small fraction of project cost, with most of the pledge returned to its funder afterwards, and never more than was pledged. Baseline highlight numbers include:

1 · CHARITABLE LEVERAGE

$281 : $1

private to philanthropic
A $10M pledge stands behind about $2.8 billion of privately funded development when measured over a 20-year commitment.

2 · EFFICIENT, NON-DISTORTIVE

0.40%

The implied subsidy as a share of project cost: about $310k on a $77M project, or $1,552 on a $385,000 home.

3 · VISIBLE IMPACT

7,293 homes

36 assured projects over 20 years, 10 of them funded from surplus. Expected back to the funder: $9.7M of its $10M pledge, and never more.

Results at the starting values of the tool, described below. All figures are illustrative outputs of a simulation whose key assumptions are placeholders awaiting calibration. They are not forecasts. Specific values used are intended to be representative of market-rate values and distributions at project, industry and capital-markets levels; they are subject to change over time and through refinements in the tuning of this industry-acceleration tool.

1. Why assure income and not subsidize cost

Institutional capital sources and their lenders are not against mass timber. They are unsure of the outcomes enabled. Capital markets hold no prejudice against the material, but uncertainty alone leads them to assign it higher risk. That uncertainty sits in one place in the proforma: the forecast of NOI.

The uncertainty is greatest when a new product goes into an asset with a very long economic life that is costly to correct. NOI is also where a dollar matters most. A building is valued by dividing its NOI by a capitalization rate, so at a 6% cap rate each dollar of annual NOI is worth about $16.67 of value, where a dollar of cost is worth a dollar. The same $5 or $10 million that would pay down cost on one project can, placed behind forecast income, reach larger and more visible developments, the kind that change what the market believes is normal.

2. How the mechanism works

1. **A funder makes a pledge.** For example $10 million, held in U.S. Treasuries at a money-center bank that supplies cash when a top-up is due. This would be in partnership with one or two blue-ribbon investment allocation firms, aligned to their existing investment strategies.
2. **Projects are assured.** One at a time, every several months. For each, the mechanism stands behind the top slice of forecast NOI for the first three to five years after delivery: lease-up, stabilization, and one to three years of normal operations. This “sizing” would be at the deal level, per the LP investor's and the tooling administrator's underwriting.
3. **Shortfalls are topped up.** If actual NOI falls short of forecast, the mechanism pays the difference in arrears, up to a limit. The investors and the lender realize forecast cash flow; IRRs are improved by superior near-term cash flows, and discount rates are relaxed by lower deal-level risk.
4. **Surplus proceeds replenish the mechanism.** At sale or permanent refinance, top-ups can be repaid if excess proceeds are generated, which is to say if money remains after the return of the loan and the equity and the payment of market-rate preferred returns, but before the GP / LP / sponsor excess-proceeds waterfall splits per industry norms. Any funds returned support the next project. After twenty years of market support, unused or remaining capital returns to the funder as the mechanism is retired, having produced sufficient evidence to enable reliable underwriting for mass timber market-rate development deals.

How it would be run

- **Aimed at capital sources, not project developments.** The assurance is arranged with institutional capital sources (allocators). A project development team would not know whether it benefits from the assurance. That stays with the capital source's fund management and investment committee, in conversation with the administrator, which limits selection bias (i.e. only deals that would otherwise be approved, except for the risk due to mass timber's use, are funded).
- **An administrator the industry already trusts.** It reviews the lender's and the capital source's underwriting and confirms that the forecast is reasonable. That forecast becomes the baseline the assurance is measured against. Furthermore, this insulates the selection of projects for subsidy from supply-side political pressures.
- **Real estate development norms are respected.** Proceeds go first to the lender, then to the equity's preferred return, then to the return of equity, then to repay the mechanism. Anything beyond that is shared between the general and limited partners under the project's own waterfall. The mechanism never recovers more than it paid. Market-rate risks and returns otherwise accrue to private capital.
- **The funder's goal is impact.** This is philanthropy, not an investment. The funder may or may not see the funds pledged returned; it will not see more than its pledge returned. The program is managed to that end: assurance commitments are made relative to incurred losses, so that surplus is put to work assuring additional projects, and the program tapers off after its twenty-year intervention period. Interest earned on the deposit during the administration may or may not be returned to the funder.

3. The model

The tool simulates 2,000 possible futures. In each, the mechanism commits to a new project at a fixed interval for twenty years, pays top-ups during each project's assured years, recovers what it can at each project's exit, and returns money not held against an active project to the funder after year twenty, up to the amount pledged. The model is described here in words; its code is not part of this note.

Project

- Each project has a market-standard construction duration (two years), with no income and no assurance, followed by market-standard assured years (one for lease-up, one for stabilization and one to three for normal operations and cash flow distributions). It is sold or refinanced at the end of the assured period.

- Forecast NOI in the lease-up year is a set share of stabilized NOI; from stabilization it grows 3% a year. Stabilized NOI is the project's cost multiplied by its year-one unleveraged yield.
- Projects are at market-standard leverage; in the model, each carries a commercial bank loan amortizing over 20 years. Equity is the remainder of cost.

Assurance and top-ups

- In each assured year the mechanism will pay the shortfall of actual against forecast NOI, up to the lesser of a dollar limit and a share of that year's forecast NOI.
- The mechanism commits to a new project only if its balance, less the amounts already held against active projects, covers the new project's largest possible claim. It therefore cannot run short on a promise. If it cannot cover a new project when one is due, that project is skipped.
- Surplus is recycled. In any quarter before year twenty, if the balance exceeds the pledge by at least one project's largest possible claim, after holding back for active projects at the loss rate the mechanism has incurred so far, an additional project is assured.

Outcomes

- Each project's NOI differs from forecast by a persistent amount for the whole assured period, plus a smaller year-to-year variation. The persistent amount is drawn from a distribution with separate spreads for bad and good outcomes.
- Part of each project's outcome is shared with other projects that reach exit in the same year, representing the market. The rest is the project's own.
- Exit value is calibrated so that the middle project earns a set leveraged return on equity, and varies with the project's NOI outcome and with a separate swing in sale prices.

Repayment

- At exit, proceeds repay the loan balance, then the equity with its preferred return compounded over the project's life. Top-ups are repaid from any surplus that remains, up to the amount paid and no more.
- The funder is never returned more than its pledge. Any balance beyond the pledge at wind-down stays with the program; the model reports it separately.

Starting values (illustrative of market-rate scale, range and norms)

SETTING	STARTING / MEDIAN VALUES	SENSITIVITY RANGE IN THE TOOLING
Funder's pledge on deposit	$10 million	$10M to $100M
Top-up limit per project, per year	$500,000, and no more than 10% of forecast NOI	$100k to $500k; 2% to 10%
Years of NOI assured after delivery	3	3 to 5
A new project every	9 months	3 to 18 months
Median leveraged return on equity	14%	10% to 18%
Spread of bad outcomes (NOI below forecast)	20%	10% to 60%
Spread of good outcomes (NOI above forecast)	20%	10% to 30%
Shared market risk between projects	30%	0% to 90%
Preferred return paid first	9%	9% to 11%

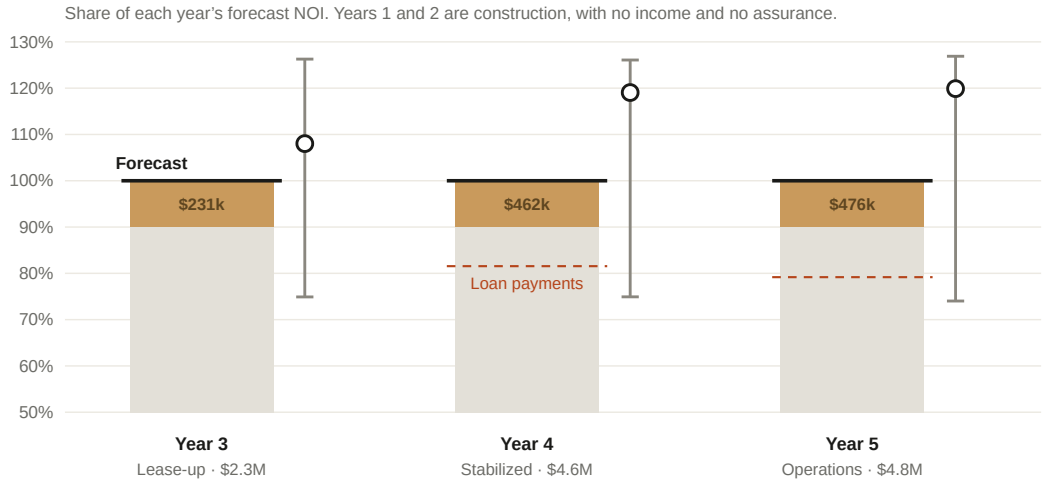
Project cost; homes	$77 million; 200	$30M to $200M; 50 to 400
Year-one unleveraged yield on cost	6%	5% to 7.5%
Bank loan; interest rate; amortization	55% of cost; 6.25%; 20 years	40% to 70%; 4% to 8%; fixed
Forecast NOI in the lease-up year	50% of stabilized	25% to 75%
Swing in sale prices	6%	0% to 15%
Interest on the deposit	5%, the 10-year U.S. Treasury yield as assumed	fixed
Period of new commitments	20 years	fixed

4. Results at the starting values

At the starting values, a $10 million pledge assures about 36 projects over twenty years, of which about 10 are funded from surplus. The funder is expected to receive $9.7 million of its $10 million pledge as the program winds down. The pledge comes back in full in 80% of simulated futures, and never more than the pledge is returned. An expected $2.7 million beyond the pledge remains with the program at wind-down.

Figure 1. One project: forecast income and the assured slice

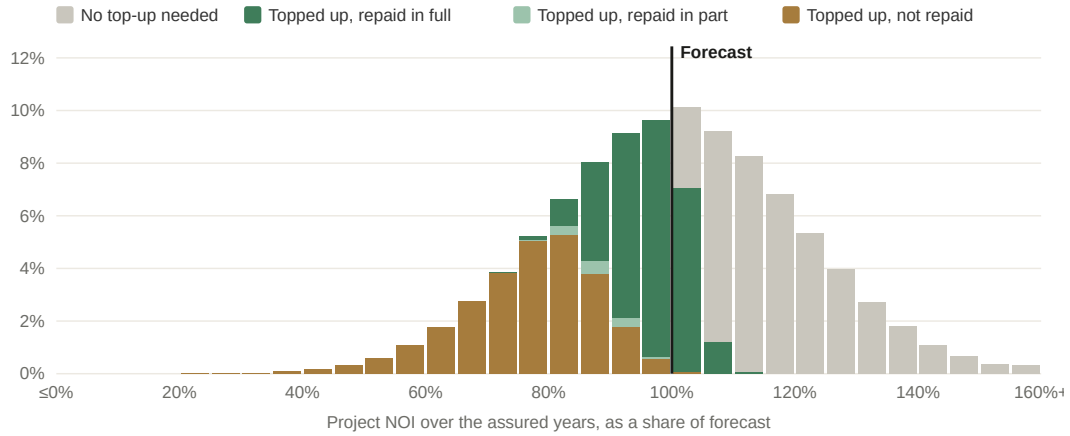
Most the mechanism can pay one project: **$1.17M** over 3 years. Expected use: **$156k per project, per assured year**, which is 3.4% of stabilized NOI. 58% of projects draw something.



The assured years of one project, drawn as a share of each year's forecast. The dark line is forecast NOI and the gold cap is the slice the mechanism assures. The whisker beside each bar spans four in five simulated outcomes. The dot is one outcome, with a gold bar where the mechanism tops it up.

Figure 2. Every assured project: how it performs and what the mechanism does

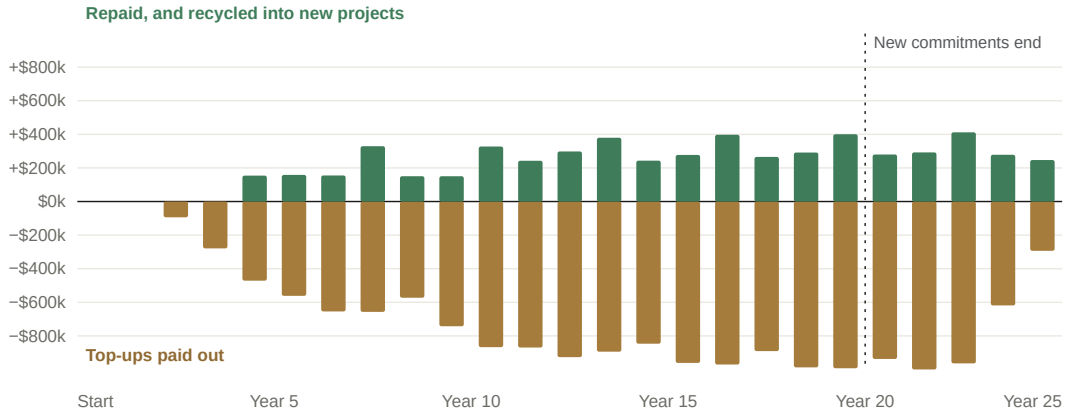
Of every 100 assured projects, **42** need no top-up, **29** are topped up and repay in full, **1** repay in part and **27** repay nothing. Those that repay nothing cost the mechanism **$1.12M** each on average, against **$310k** across all projects.



Every project the mechanism assures across all simulated futures, placed by the NOI it achieved over the assured years. The spread of this shape is the deal-level performance being assumed. Projects left of the forecast line draw on the mechanism; colour shows whether sale or refinance proceeds were enough to repay it.

Figure 3. Money out to projects and back in, year by year

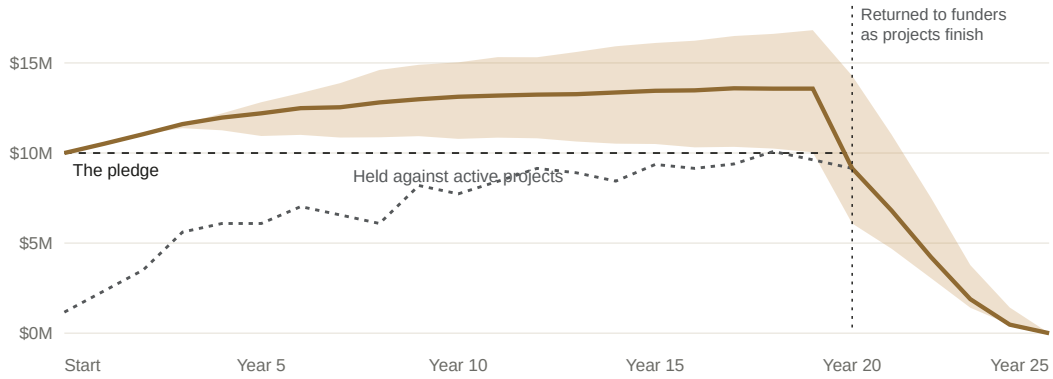
34 cents of each top-up dollar is expected back. 27% of projects finish below the 9% preferred return and repay nothing. Expected net cost: **$310k a project**.



The average across all simulated futures. In the early years money only goes out. Repayments begin when the first projects are sold or refinanced, recover part of what was paid, and are recycled into new projects. After year 20 no new projects are added and the last ones run off.

Figure 4. The pledge over time

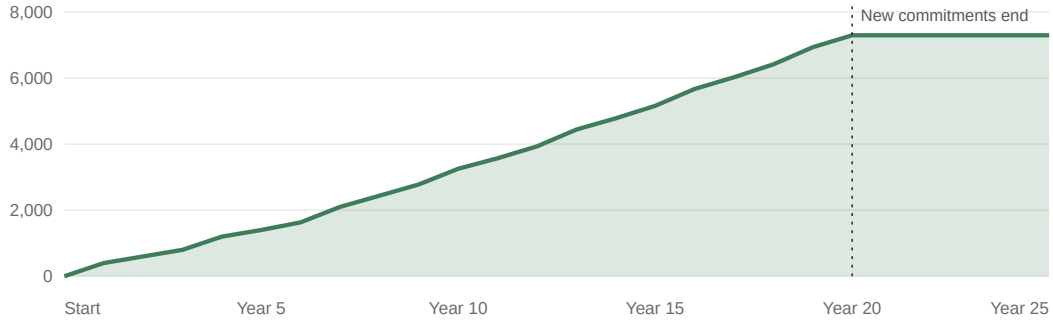
Smallest pledge that launches the flywheel: **$8.2M**, enough for the 7 projects committed before the first one repays. In 97% of simulated futures the pledge can back every new project when it is due. Surplus beyond the pledge is recycled: it funds **9.5 additional projects** on average. Expected back to the funder as the program winds down: **$9.7M** of a $10M pledge. The pledge comes back in full in 80% of simulated futures, and never more than the pledge is returned.



The balance on deposit. The solid line is the middle outcome and the band covers four in five. The dotted line is the part held against projects that are still active. After year 20, money is returned to the funder as each remaining project finishes.

Figure 5. Homes in assured projects

36 projects, **7,293 homes** and **$2.8 billion** of development over 20 years of commitments.



Homes in projects the mechanism has assured, added up from the year each project is committed.

Sensitivity

Each row changes one setting from the starting values. Where the setting raises the smallest workable pledge, the pledge is raised to that minimum.

SETTING CHANGED	LEVERAGE	IMPLIED SUBSIDY	PROJECTS (FROM SURPLUS)	HOMES	EXPECTED BACK TO FUNDER	PLEDGE BACK IN FULL
Starting values	$281 : $1	0.40%	36 (10)	7,293	$9.7M of $10M	80%
Bad outcomes spread to 10%	$376 : $1	0.19%	49 (22)	9,778	$10.0M of $10M	100%
Bad outcomes spread to 30%	$249 : $1	0.50%	32 (6)	6,480	$8.9M of $10M	55%
Bad outcomes spread to 40%	$235 : $1	0.56%	31 (4)	6,116	$8.3M of $10M	41%
Bad outcomes spread to 50%	$228 : $1	0.59%	30 (3)	5,934	$7.8M of $10M	32%
Bad outcomes spread to 60%	$224 : $1	0.62%	29 (3)	5,827	$7.5M of $10M	26%
Shared market risk 60%	$284 : $1	0.40%	37 (10)	7,369	$9.5M of $10M	75%
Project every 6 months ($12M pledge)	$294 : $1	0.41%	46 (6)	9,178	$11.0M of $12M	64%
5 assured years ($22M pledge)	$156 : $1	0.56%	45 (18)	8,932	$22.0M of $22M	100%
Pledge of $25 million	$207 : $1	0.40%	67 (40)	13,418	$25.0M of $25M	100%

The last column is the share of simulated futures in which the whole pledge is returned. Three observations follow. First, as bad outcomes widen, less surplus arises, fewer additional projects are assured and less of the pledge comes back: about $9.7 million of $10 million at a 20% spread, and about $7.5 million at 60%. Second, shared market risk barely moves the averages but lowers the chance that the pledge comes back in full. Third, a larger pledge, a faster pace or milder outcomes are converted into more assured projects and homes, not into money returned beyond the pledge. In the mildest cases the surplus rule still leaves a sizeable balance unspent at wind-down, which a program would direct to further projects or another charitable use.

5. Limits and next steps

- **The spread of outcomes is a placeholder.** It is to be tuned and calibrated against actual data; for example, real estate investment trust results and open-end core fund (NCREIF ODCE) data, ideally the spread of property-level outcomes within large portfolios, and failing that the spread of fund performance.
- **Outcomes are nearly all-or-nothing in the model.** Good deals work and bad deals do not; it is hard to foresee the difference years ahead of time. A project that clears the preferred return usually has ample surplus to repay in full, so few repay in part. This follows from the exit-value assumptions and should be tested against experience.
- **Market conditions in one year are treated as unrelated to the next.** This understates how long real downturns last. Macro business-cycle risk that is not specific to a project may therefore be material, and would be an important governance consideration as to rights to modify, extend or pause administration.
- **"Expected" means on average.** At the starting values, about 20% of simulated futures return less than the full pledge.
- **The surplus rule is one of several possible.** How surplus is measured and committed, and what becomes of any balance beyond the pledge at wind-down, are governance choices to be settled with funders and the administrator.
- **Terms are untested with counterparties.** The next steps are to calibrate the model, test the terms with institutional capital sources, lenders and sureties, and pilot the mechanism on a small set of developments.

6. Authorship, rights and citation

The Market Rate Development Risk Mitigation Method and the Mass Timber Cashflow Assurance Mechanism were created by Noel A. Johnson. The idea, its intellectual property and all rights to commercialize it are retained by Old i, LLC (Conrad). It is published by Mass Timber Finance & Consumer for public review and comment.

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