

Issuance Design and Benchmark Accumulation in Sovereign Green Bond Markets: Evidence from Canada

Piotr Pach

Department of Business and Management, Roskilde University, Denmark

INTRODUCTION & AIM

Sovereign benchmark bonds concentrate issuance and support liquid reference securities. Yet research on sovereign green bonds has focused mainly on **yield differentials** and **green premia**, leaving benchmark formation through issuance strategy comparatively underexplored.

BEYOND THE GREENIUM

Pricing similarity does not necessarily imply benchmark-role equivalence.

This study shifts the focus from **how green bonds are priced** to **how sovereign issuers build them into benchmark securities**. It follows individual bond lines from initial issuance through successive reopenings toward benchmark scale in the Government of Canada market.

How does issuance design shape benchmark accumulation, and do sovereign green bonds develop the same benchmark role as conventional bonds?

YIELD / GREENIUM → **ISSUANCE DESIGN** → **BENCHMARK SCALE** → MARKET FUNCTION

METHOD

Empirical setting and data.

Original issuance-event panel covering **211 issuance events** across **42 Government of Canada bond lines**, followed from initial issue through successive reopenings.

Measuring benchmark accumulation.

Scale ratio = Outstanding amount / Benchmark target midpoint
1.0 = benchmark target midpoint

Published benchmark target ranges (CAD bn)

2Y 26-34 midpoint 30	5Y 38-46 midpoint 42
10Y 38-46 midpoint 42	30Y 28-38 midpoint 33

Target midpoints provide the **denominator of the scale ratio**.

Empirical strategy.

Issuance-cycle regressions test systematic accumulation, maturity heterogeneity and green relative convergence. Standard errors are clustered at the bond-line (ISIN) level.

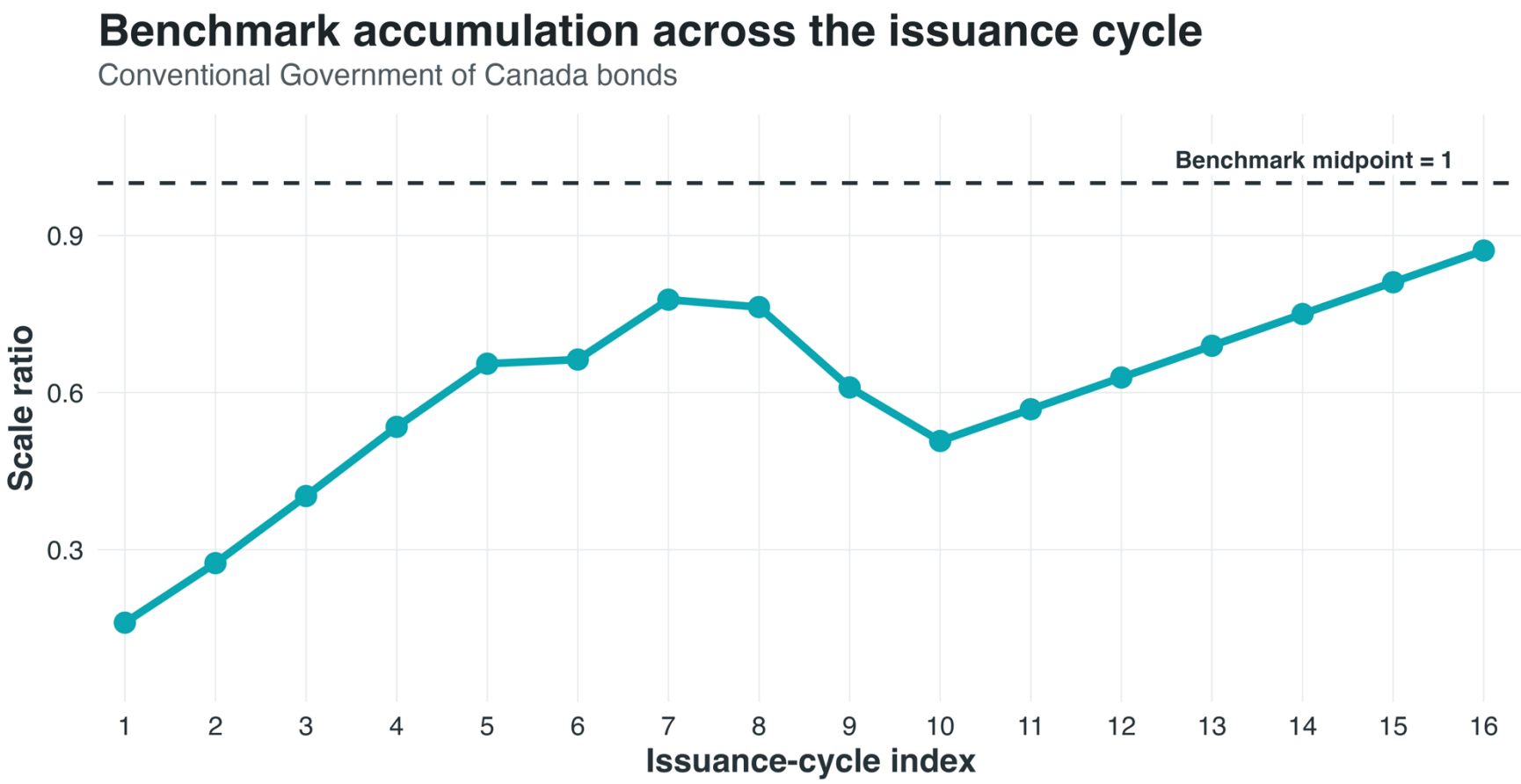
Secondary-market evidence.

33,762 Refinitiv bid–ask observations complement the issuance analysis with secondary-market liquidity evidence.

RESULTS & DISCUSSION

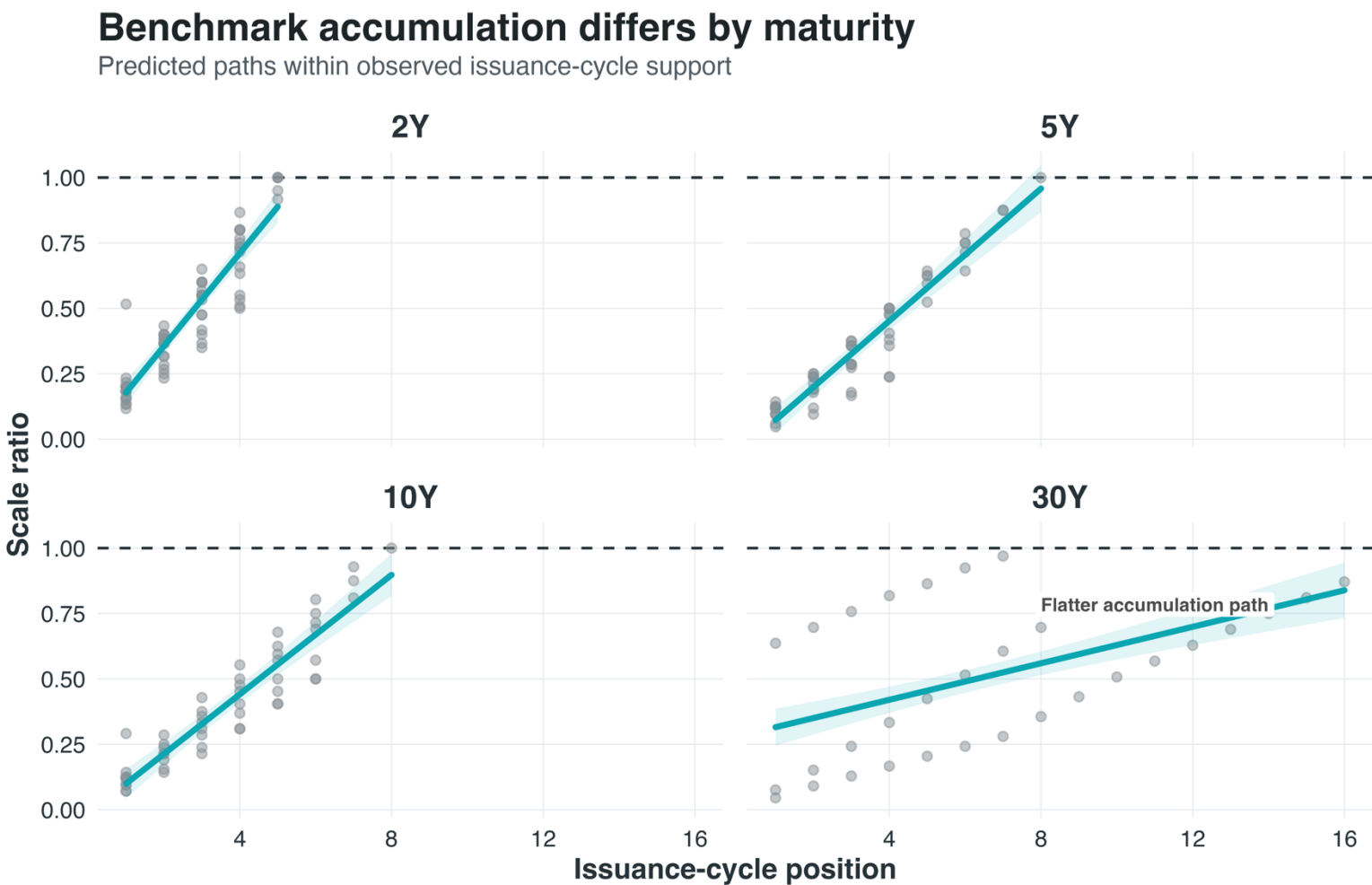
1 BENCHMARK ACCUMULATION IS SYSTEMATIC

Conventional Government of Canada bonds accumulate progressively toward benchmark scale across successive issuance events. **Benchmark formation therefore emerges as an issuance-driven accumulation process.**



2 MATURITY SHAPES THE ACCUMULATION PATH

Accumulation is **not uniform across the yield curve**. Short- and intermediate-maturity bonds converge more strongly, while the **30-year segment follows a markedly flatter path**.



3 SIMILAR CONVERGENCE - SMALLER GREEN SCALE

Green bonds do **not show a statistically robust difference in relative convergence dynamics**. The economically important distinction lies instead in issuance design: **smaller initial issuance, fewer issuance events and lower final outstanding scale**.

Green bonds are built at a smaller scale

Smaller initial issuance • fewer issuance events • lower final scale

	INITIAL ISSUE CAD billions	ISSUANCE EVENTS Average per bond line	FINAL OUTSTANDING CAD billions
Conventional	CAD 4.41bn	5.45	CAD 24.33bn
Green	CAD 3.13bn	1.50	CAD 13.86bn

Green final outstanding based on non-missing bond lines (n = 2).

CONCLUSION

Benchmark status is built through issuance design and repeated accumulation, not achieved automatically.

Canadian evidence shows systematic benchmark accumulation and strong maturity heterogeneity, while **descriptive issuance-design evidence points to smaller absolute green-bond scale**, despite no robust difference in relative convergence.

Implication: sovereign green-bond integration depends not only on pricing, but also on the issuance architecture that enables benchmark-scale market function.

FUTURE WORK / REFERENCES

Future research should test whether alternative sovereign green-bond designs strengthen benchmark integration across countries and how benchmark scale translates into liquidity and collateral relevance.

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