# The impacts of unanticipated defaults in LVTS

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# Purpose

Given LVTS framework

- DNS system collateralized to cover largest net debtor's position
- Defaults and loss sharing by survivors possible
- Guaranteed to settle in the event of multiple defaults without unwinding payments

Estimate impact of default scenarios on survivors' capital positions – can they withstand their losses?

# Comparison to literature

- Potential for knock-on defaults in:
  - Uncollateralized systems: Humphrey (86), Angelini et. al. (96), Northcott (02)
  - Uncollateralized system or collateralized LVTS-type system: Galos and Soramäki (05)
- BoF-PSSII literature
  - Liquidity saving: Soramäki and various co-authors: Koponen (98): Leinonen (99, 03); Bech (01a, 01b, 02); Johnson, McAndrews (04)
  - Operational risk: Bedford, Millard and Yang (04)

# LVTS payments

**Tranche 1**

- Fully self-collateralized defaulter-pays stream

**Tranche 2**

- Partially survivors-pay
- Participants can incur larger negative position than collateral to cover it
- Survivors' loss allocations based on size of credit limit granted to defaulter

# Settlement & default

- Settlement: must have funds or collateral to cover –ve position
- Participant in default if:

(i) can't meet its EOD obligation

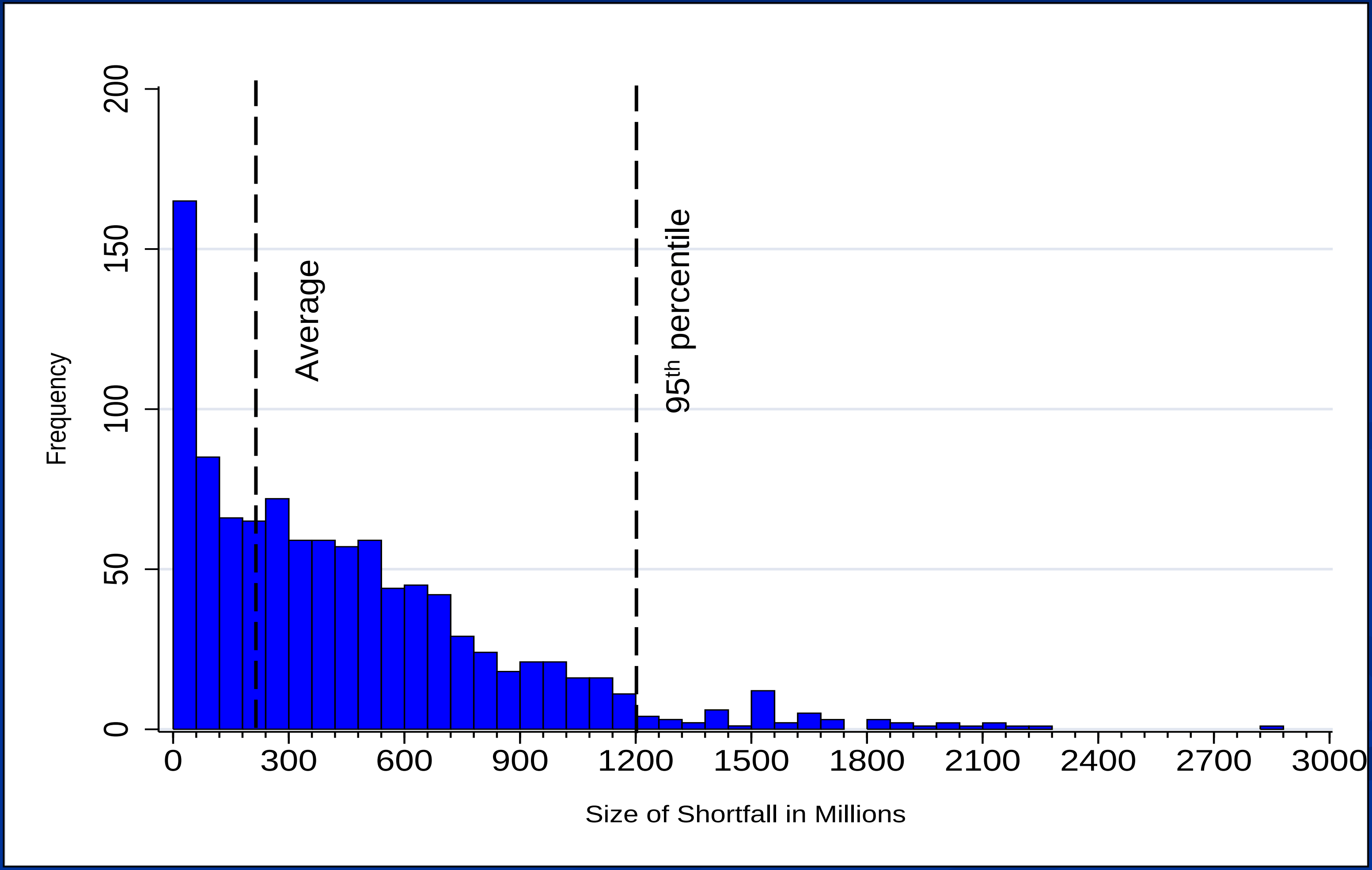
(ii) closed by regulator with –ve position

- If a default, Bank of Canada will grant an advance up to value of defaulter's collateral
- If advance < defaulter's NDP, survivors will cover residual losses

# Procedure for finding defaults

- 170 day data sample spanning Mar. – Oct. 04
- Find max -ve position each day for each participant using simulator, default based on that position
- If position is negative, compare to collateral to determine if there is a shortfall
- If shortfall, calculate losses to survivors

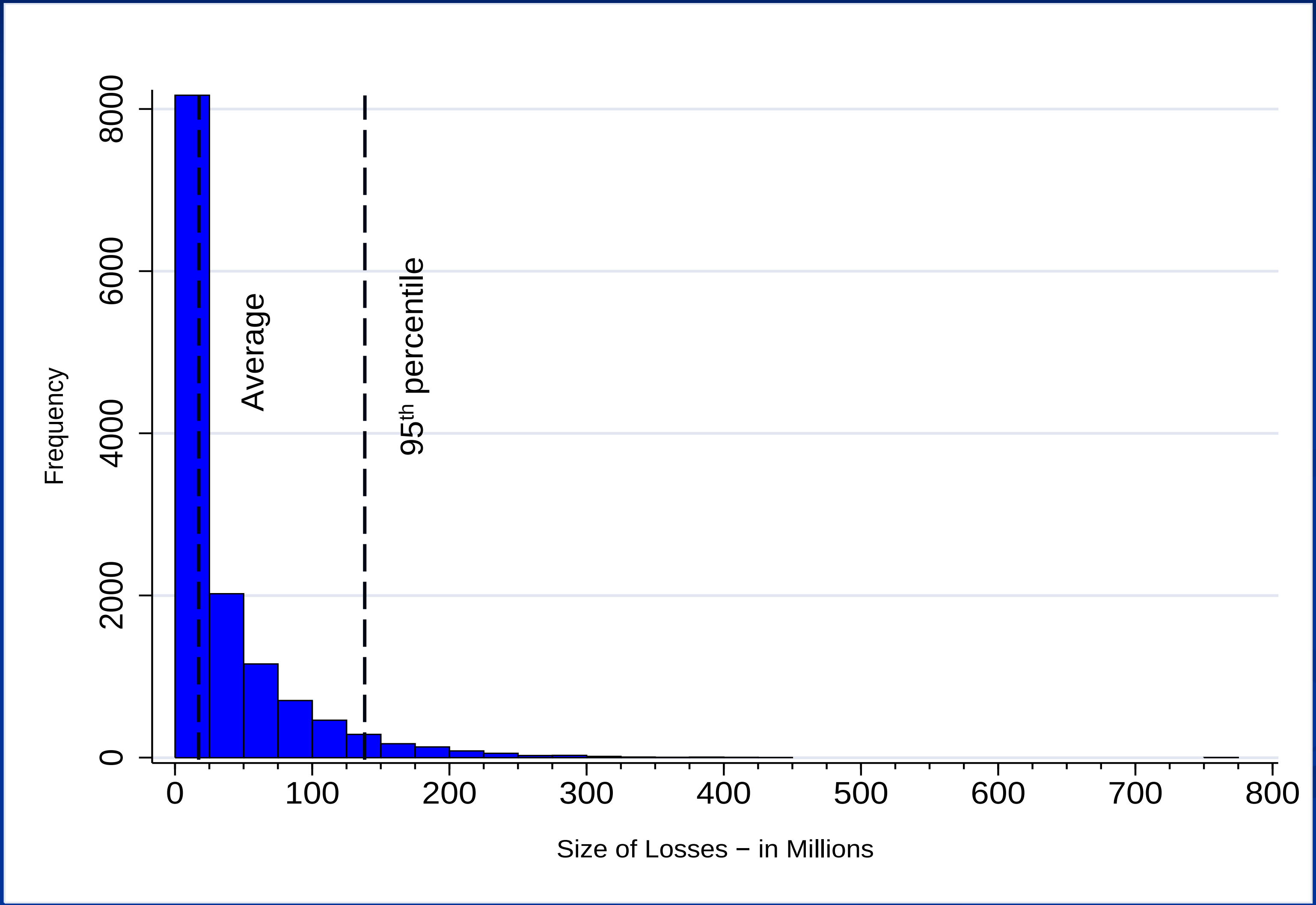
# Shortfalls generated are frequent and small, but large variance across participants and days



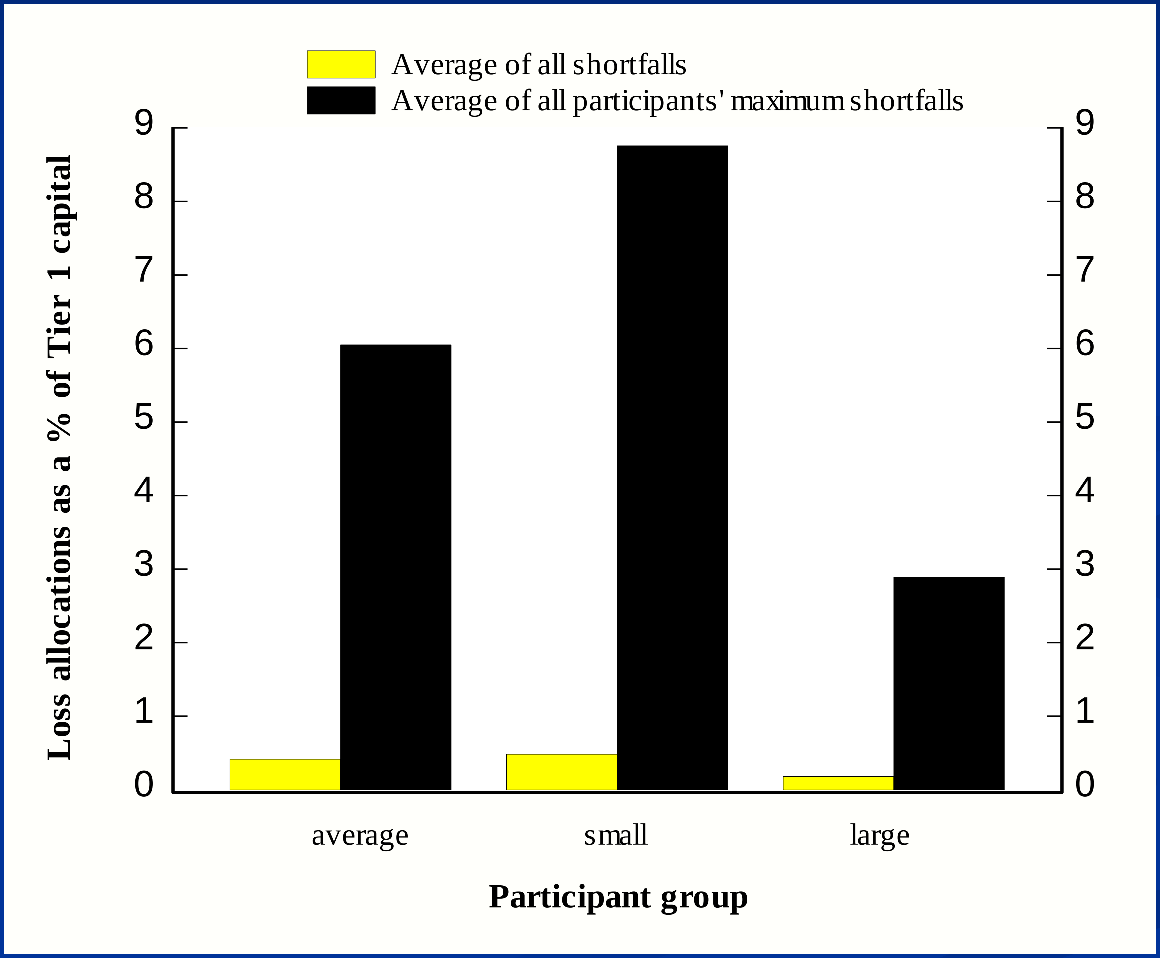
# Shortfalls are much smaller than largest possible

- Generated shortfalls found based on max. –ve positions participants incurred in data
  - Avg. = 3.5% of max allowed
  - Largest = 25% of max. allowed
- Implication: shortfalls (and losses to survivors) could be 4 - 30 times > found here

# Survivors' losses are small



# Losses compared to capital generally small but larger for small participants



# Impacts of assumptions

| Assumption | Impact |
|---|---|
| Regulatory closure at worst point during day<br>▪ Even closure during day unlikely | + |
| Shortfalls based on smallest collateral holdings<br>▪ Participants hold more collateral | + |
| Shortfalls based on actual payments data<br>▪ Based on normal times | - |
| Bilateral credit limits (BCLs) according to data<br>▪ BCLs to weak bank likely to be zero or v. small | + |
| Overall | + |

# Conclusions

- Following worst-case defaults based on LVTS data, shortfalls are frequent but survivors' losses are manageable
- The day and participant defaulting have impacts
- Small participants take on relatively more risk