A Revisit of the Loan Concentration – Bank Performance Nexus

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What are we trying to discover?

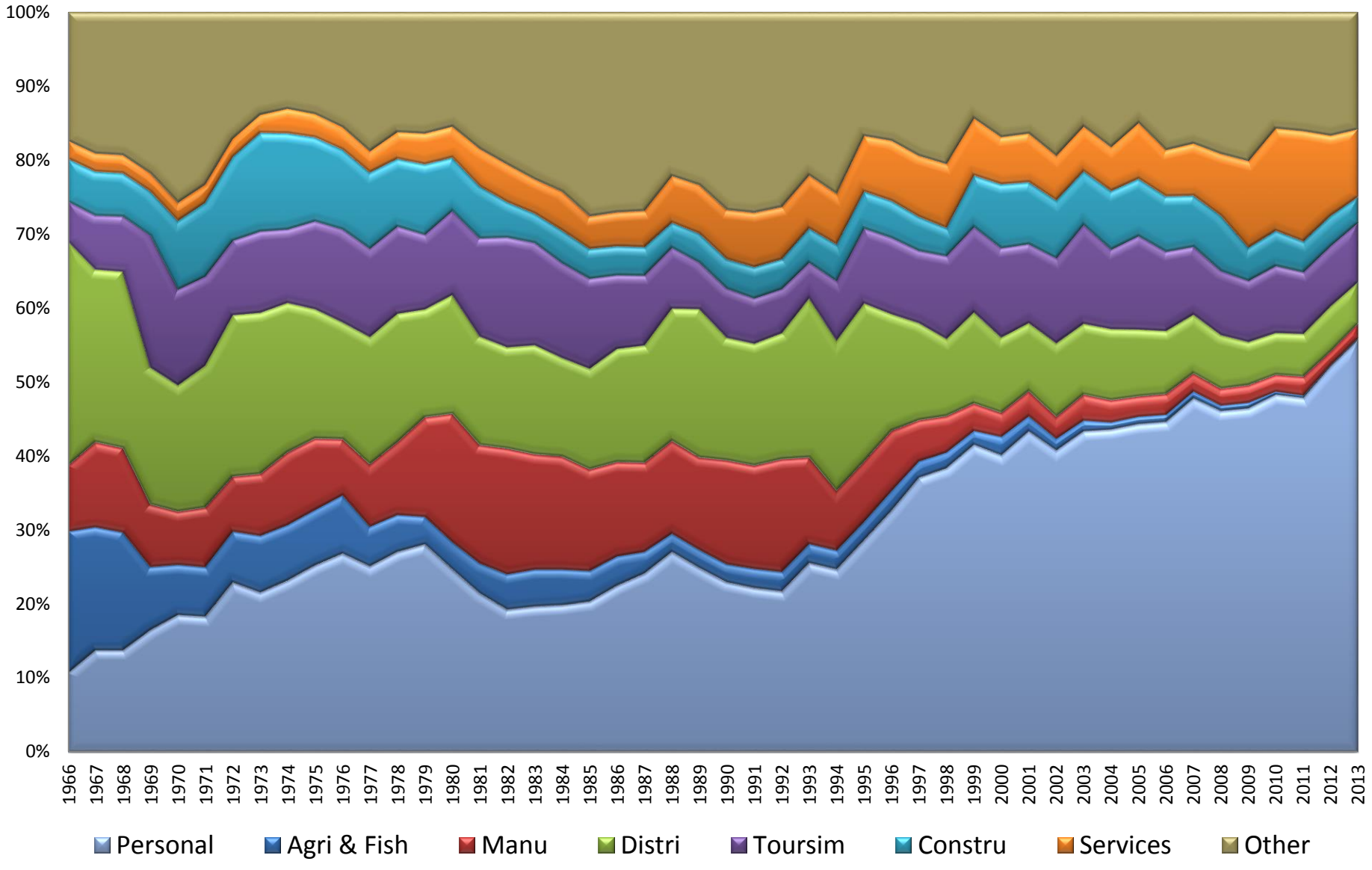
STRESS POINTS RELATING TO:

- The impact of loan concentration on bank performance
- Is the behaviour homogenous among all banks?
- Does the relationship hold under all conditions? If not, then what might be leading indicators of changing conditions?

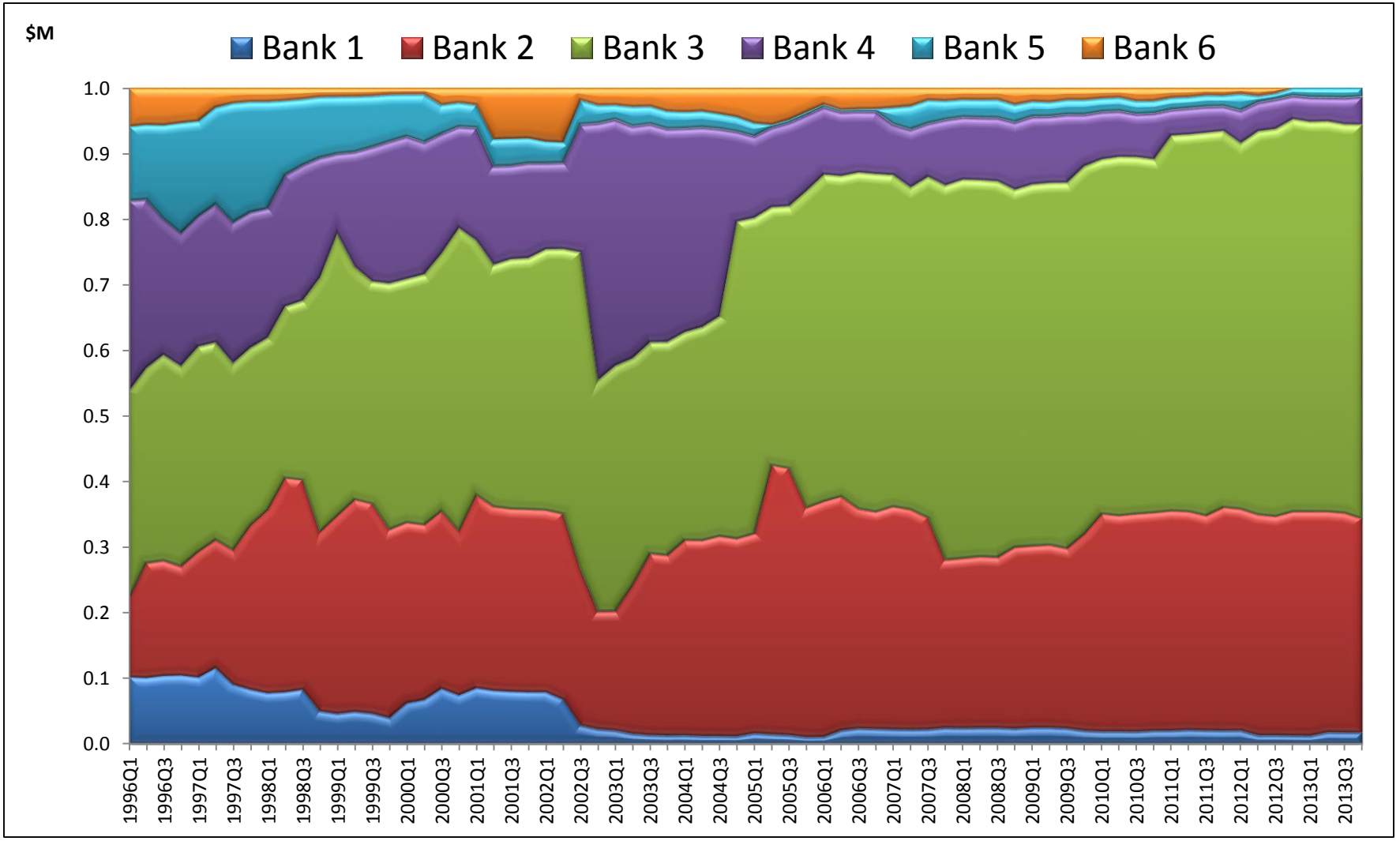
Mode of Investigation

- What does the literature say?
- Observations from the data
- Methodological approach
- Empirical Assessment
- Inferences
- Way Forward
- Conclusion

Our Starting Point… Loan Distribution



Example of Bank Concentration in a Selected Sector



Concentration… Is it a problem?

The emergence of Risk…

- Inherent issue, given the structure of economy
- What are the institutions' perceptions about concentration?
- How does the policy maker set out to deal with this if it is a problem?

Developments from the Literature

- **Traditional Portfolio Theory:**
  - Through diversification, banks can reduce risk of its portfolio and increase expected returns.

    Markowitz (1952); Sharpe (1964); Rugman (1979, 1986)

- **Focus on loan portfolio diversification:**
  - Significant gains from diversification: *Diamond (1984)*
  - Diversification implies higher costs and is not worthwhile if downside risks are low. If downside risks are high, diversification amplifies bank failure due to wide exposure and the cost to monitor those exposures. *Winton (1999)*

Literature Con't

Some Empirical Findings:

…diversification of bank assets does not guarantee superior performance (returns) and/or lower risk for banks. The general finding supported Winton's non-linear, U-shaped nexus.

Acharya et al. (2004), and Hayden et al. (2007)

In contrast, Cotugno and Stefanelli (2012) found diversification improved returns (both risk-adjusted and unadjusted returns)

Literature Con't

Studies among LAC countries also provided conflicting findings; eg.

- Tabak et al. (2011) and Bebczuk & Galindo (2008) rejected the U-shaped relationship.
- Craigwell et al. (2006) and Langrin & Roach (2009) – evidence of U shaped relationship.

Lit. Conclusion

- Inconclusive relationship
- Important factors for consideration include: banks' level of risk; business cycle effects; level of bank concentration.

Investigation Framework

Performance

- ROA
- Int. Income/Average Loans

Concentration

(Kamp, Pfingsten & Rudolph 2005)

- **Naïve Measures:**
  - Hirshmann-Herfindahl Index; Gini Coefficient; Shannon Entropy
- **Benchmark Measures:**
  - Maximum absolute difference; normalised sum of absolute differences; normalised sum of square differences; average relative difference; average square relative difference

Control

- Bank Size
- Real GDP
- Personnel cost/Average assets

Empirical Framework

$$Return_{it} = \beta_{i0} + \beta_{11} CM_{it-1} + \beta_{21} V_{it-1} + \beta_{31} Rk_{it-1} + \varepsilon_{it}$$

$$Risk_{it} = \beta_{i0} + \beta_{12} CM_{it-1} + \beta_{22} V_{it-1} + \beta_{32} Rt_{it-1} + \varepsilon_{it}$$

- If $\beta_{11} > 0$ implies that an increase (fall) in concentration (diversification), increases bank profitability and similarly, $\beta_{12} < 0$ suggests that a rise in concentration reduces risk.

Empirical Framework

Test for the non-linearity effect

- Augment equations 1&2 by including an interaction variable between CM and the measure for risk; and risk squared
- First derivative of performance in relation to concentration yields

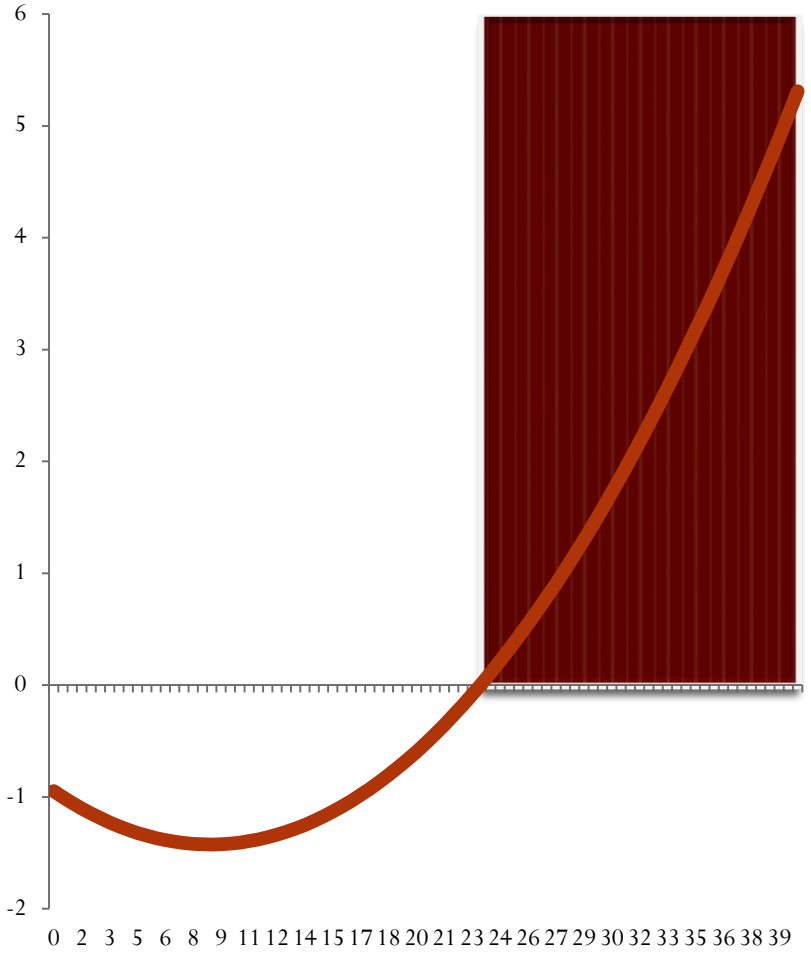
$$\frac{\partial(Return)}{\partial(Concentration)} = \alpha_1 + \alpha_2 Rk_{it} + \alpha_3 Rk_{it}^{\ 2}$$

$$where\ H_0\colon\ \alpha_2 < 0;\ \alpha_3 > 0$$

What Have We Found So Far

Consistent with the pervious work, some evidence to support U shaped relationship.

The relationship appears to remain true over the business cycle.



Where Are We Heading

- A closer look at the concentration measures
  - Are the measures of diversification substitutable?
- A more appropriate risk measure (or composite)
- Determine the threshold for low, medium and high risk
- Deriving a probability framework assessing changes in risk-return profile of each institution.

Challenge

- If we adopt the classicalist perspective and define an a portfolio as efficient if **“there is no other portfolio with lower risk and an (at least) equal expected return and no portfolio with a higher return and (at most) equal risk,”** then the natural challenge is to quantify the risk profile across the sectors of the loan portfolio.

Thank You