The Components of CDS Bid-Ask Spreads: A Reduced-form Approach

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The paper in one slide

Motivation

- What are the drivers of bid-ask spreads in single-name CDS market?

What the paper does

- Reduced-form (aka intensity-based) credit risk model;
- Enriched to include various wedges
  - *liquidity*,
  - *adverse selection*,
  - *dealers' market power*,
  - *inventory costs*,
  - *counterparty risk*.
- Decompose bid-ask spreads into components using data from Markit
- Analyze behavior of various components over time
- Study how changes in adverse selection relates to changes in CDS
- Study adverse selection's explanatory power in x-section of CDS returns

Components of bid-ask spread

What are the frictions rationalizing bid/ask spreads?

In the current draft: *liquidity*, *adverse selection*, *dealers' market power*, *counterparty risk*.

Reduced form vs. structural/micro-founded

- Currently, various frictions only appear in reduced form
- Why do these wedges have the economic interpretation given by the authors?
- Are there structural models of adverse selection and imperfect competition that end up as time-invariant wedges as in the model?

Components of bid-ask spread (continued)

What happened to inventory costs? (could not find a wedge for this friction discussed in the paper)

Is counter-party risk relevant?

- For OTC trades between dealers,
  - credit support annex ("CSA") to ISDA master agreement
  - daily collateral posting, USD cash, remunerated at FF
- Single-name CDS cleared by ICE
- If CDS traded without "perfect CSA", then price depends on
  - Exact contractual details of collateral posting arrangement
  - Identity of counter-parties
  - Markit quotes are certainly not related to these contracts

What about search?

- Prominent friction in OTC world
- Potentially easy to micro-found and cast into current reduced form framework (Duffie, Garleanu & Pedersen ECMA 2005)

Identification

Observable prices: bid and offer across CDS maturities

$\mathbb{Q}$-measure model parameters:

- default hazard λ, LGD w and convenience yield η for mid-market CDS
- adverse selection wedge l_A, mkt power wedge γ_A for offer-side CDS
- adverse selection wedge l_B, counter-party wedge γ_B for bid-side CDS

Suggestion: spend more time discussing identification

- 7 unobervable parameters to recover
- minimum 7 prices needed
- each CDS maturity observed provides 2 prices (bid and offer)
- $\Rightarrow$ need at least observability on 4 different maturities
- what are the features of the data that help identify all these parameters?

More thoughts on identification: liquidity component

Duffie & Singleton RFS 1999

- Value of defaultable claim to X is

$$V_0 = \mathbb{E}_0^{\mathbb{Q}}\left[\exp\left(-\int_0^T R_t dt\right) X\right], \qquad R_t := r_t + h_t L_t + \ell_t$$

- Risk-free rate r_t
- Risk-neutral default hazard h_t, risk-neutral mean-loss rate L_t
- Risk-neutral "liquidity" factor ℓ_t

Longstaff, Mithal & Neis JF 2005: ℓ_t proxy for bond-CDS basis

Identification?

- With a unique instrument, how we can disentangle $h_t L_t$ from ℓ_t?
- Include in calibration/estimation the price of corporate bonds for identification purposes?

$\mathbb{Q}$ MEASURE: ACADEMIA VS. PRACTITIONERS

Practitioners' approach

- $\mathbb{Q}$ measure changes every day based on market moves
- Changes are needed to make sure
  - model and market prices coincide
  - Greeks are "current" for appropriate risk-management purposes

Academic approach

- $\mathbb{Q}$ measure usually time-invariant
- In this paper, this means
  - either constant default intensities, LGD, and all wedges – meaning that the model fit will be poor given CDS mkt volatility
  - default intensities, LGD, and all wedges change each day – in which case, why do economic agents not acknowledge this when pricing CDS?
- either way, result interpretation gets murky

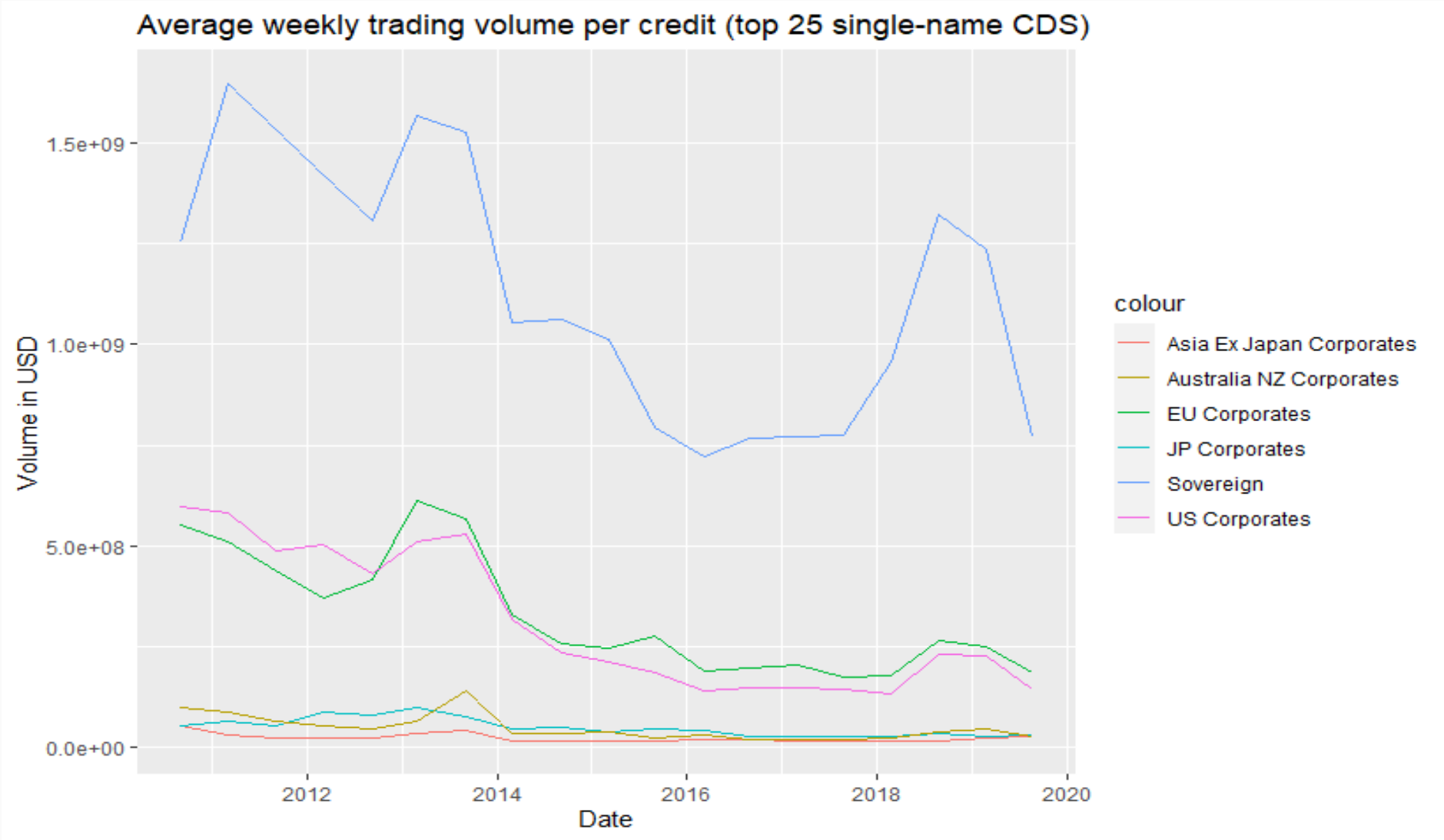
One solution

- Build model with time-varying default intensity/wedges (for e.g. exp. affine Markov models as in Duffie, Pan & Singleton ECMA 2000)
- Change in CDS mid are effectively change in the Markov state

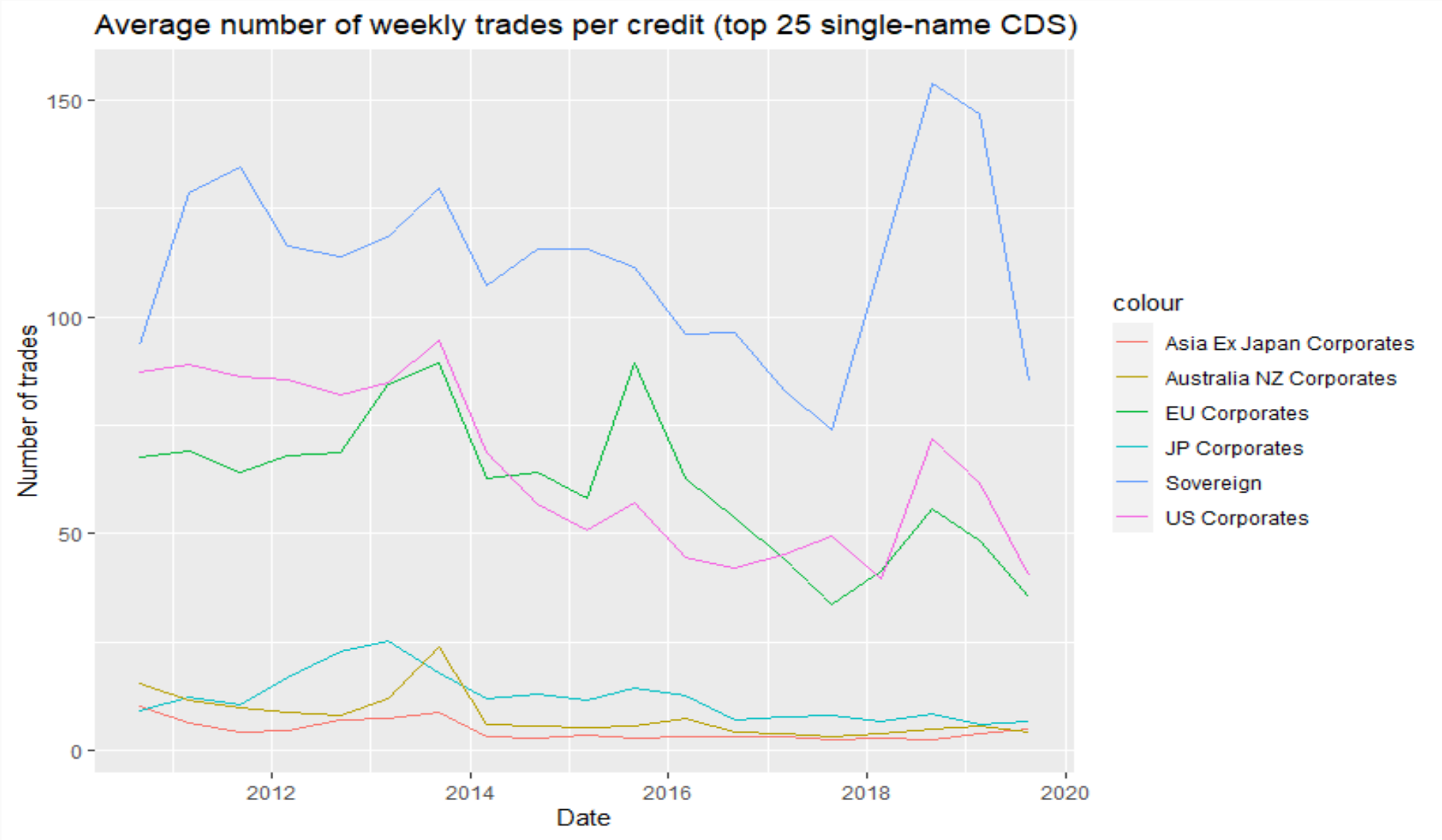
Bid-ask spreads vs. trading volumes

What exactly do bid and ask spreads provided by dealers represent when volumes are non-existent?

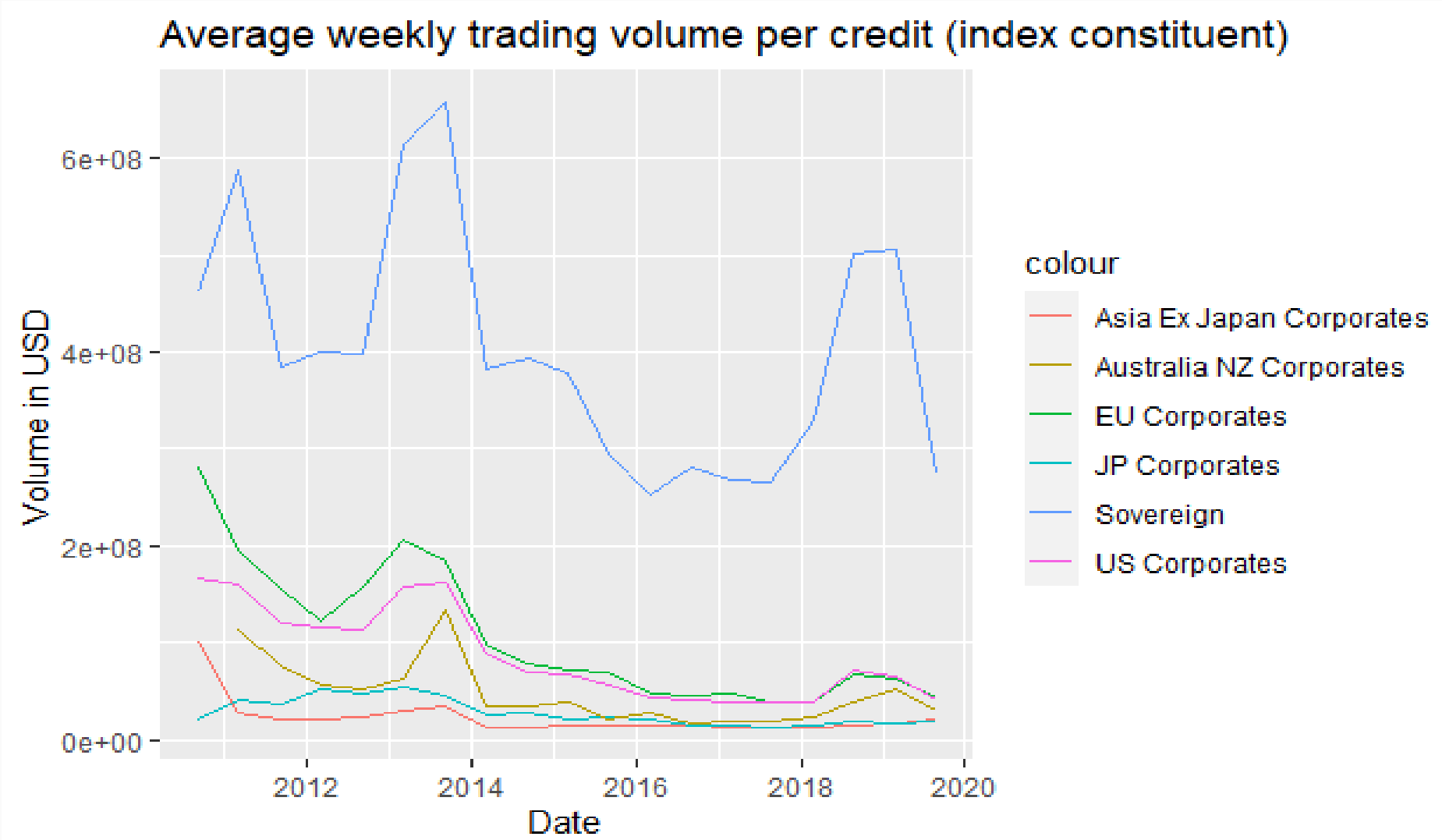
Top 25 Credits – Weekly Volume



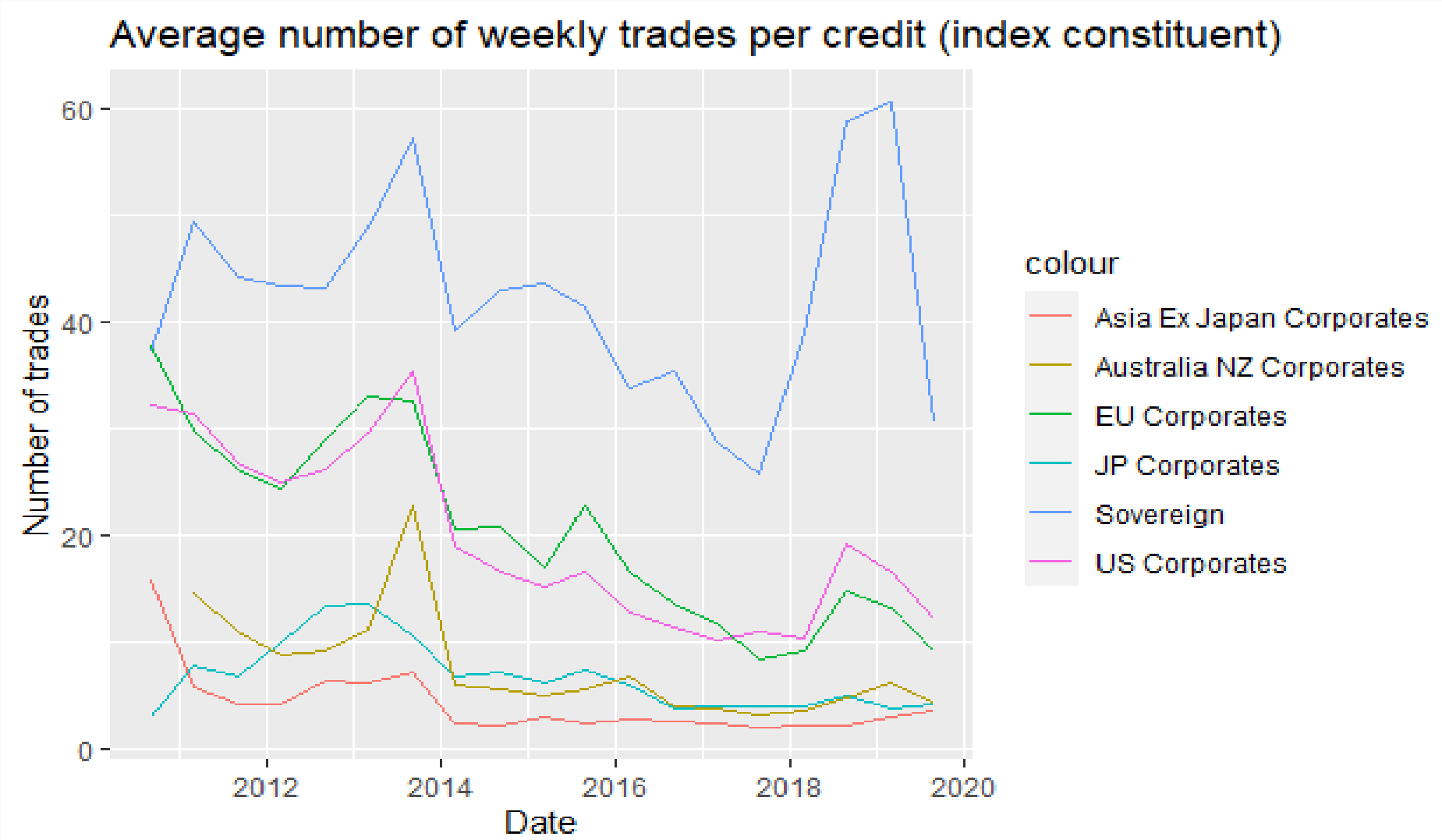
Top 25 Credits – Number of Trades



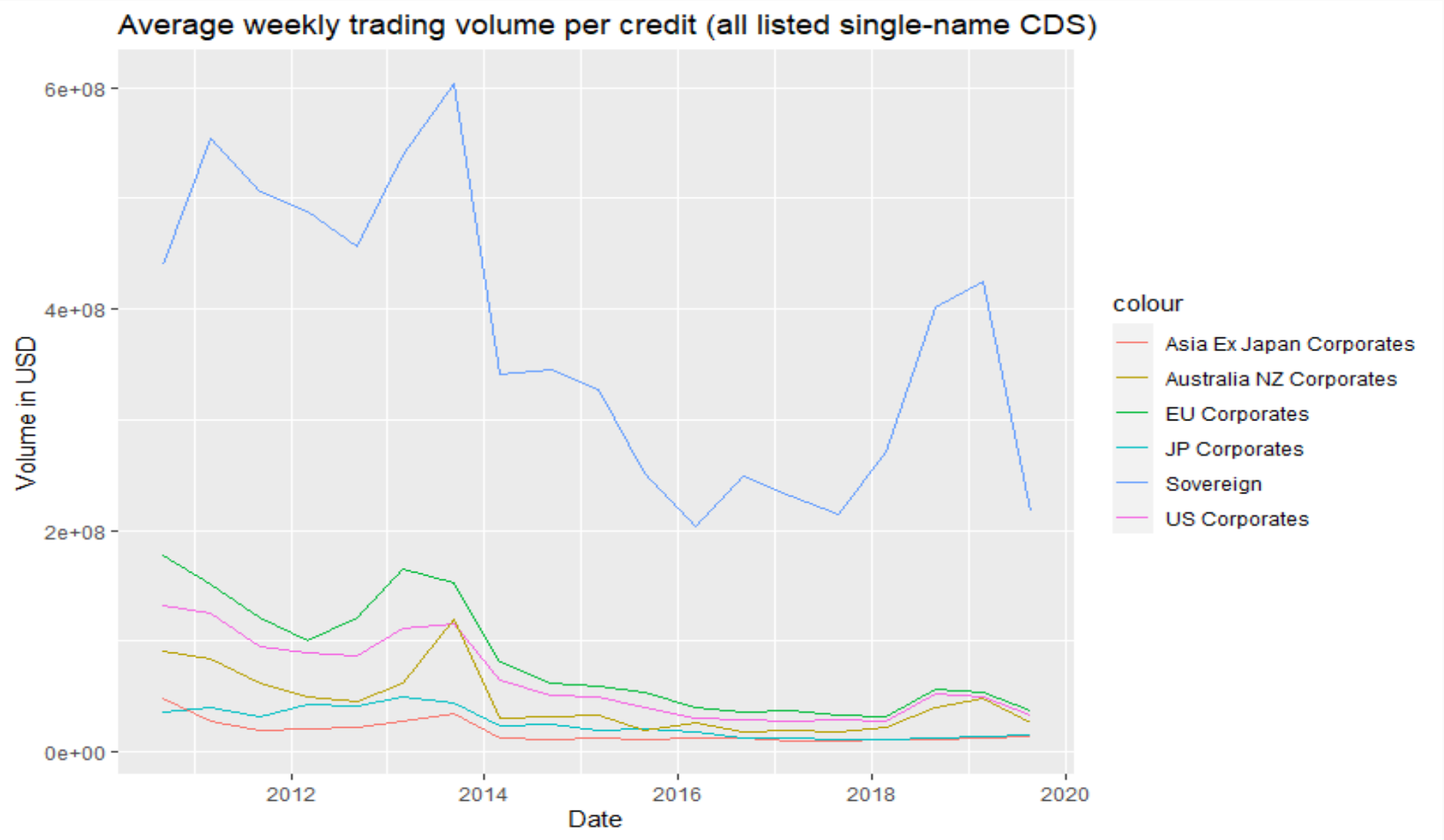
Index Constituents – Weekly Volume



Index Constituents – Number of Trades



All Traded Credits – Weekly Volume



All Traded Credits – Number of Trades