🇮🇸 Case Study 4: Comprehensive Statistical Analysis

Objective: Evaluate currency regime effects on capital flow volatility through comprehensive statistical analysis comparing Iceland with multiple comparator groups.

⚙️ Analysis Overview

> 📊 **Integrated Analysis:** Both Full Period and Crisis-Excluded results displayed together

Time Periods:

- **Full Period:** 1999-2025 (105 observations)
- **Crisis-Excluded:** Excludes 2008-2010 (GFC) and 2020-2022 (COVID-19) - 81 observations

🌐 **Comparator Groups:**

- **Eurozone:** Weighted & Simple averages (% of GDP)
- **Small Open Economies (SOE):** Weighted & Simple averages (% of GDP)
- **Baltics:** Weighted & Simple averages (% of GDP)

📊 **Indicators Analyzed:**

- Net Direct Investment
- Net Portfolio Investment
  - Debt Securities
  - Equity & Investment Fund Shares
- Net Other Investment
- Net Capital Flows (Total)

Indicators Analyzed	Comparator Groups	Full Period Observations	Crisis-Excluded Observations
6	6	105	81

📊 Comprehensive Analysis Overview

Complete statistical results across all capital flow indicators. Three master tables provide integrated Full Period and Crisis-Excluded analysis for variance equality, persistence, and predictability.

🎯 Table 1: Standard Deviation & F-test Results (All Indicators)

Indicator/Period	Iceland	Eurozone Weighted Avg	Eurozone Simple Avg	SOE Weighted Avg	SOE Simple Avg	Baltics Weighted Avg	Baltics Simple Avg
Net Direct Investment (Full)	18.040	2.272***	3.581***	23.259**	18.873	2.900***	3.247***
Net Portfolio Investment (Full)	31.115	3.826***	5.602***	21.353***	17.470***	4.746***	5.042***
Net Portfolio Investment - Debt Securities (Full)	30.546	3.579***	5.838***	11.436***	15.111***	4.522***	4.741***
Net Portfolio Investment - Equity & Investment Fund Shares (Full)	10.737	2.196***	4.023***	16.231***	22.511***	1.466***	1.764***
Net Other Investment (Full)	31.838	3.646***	5.660***	18.930***	13.976***	8.698***	8.843***
Net Capital Flows (Full)	28.628	2.161***	3.066***	16.193***	13.198***	8.079***	8.161***
Net Direct Investment (Crisis-Excluded)	14.556	2.263***	3.659***	19.341**	16.203	2.553***	2.888***
Net Portfolio Investment (Crisis-Excluded)	33.027	3.337***	4.791***	18.318***	15.968***	4.700***	4.998***
Net Portfolio Investment - Debt Securities (Crisis-Excluded)	30.546	3.579***	5.838***	11.436***	15.111***	4.522***	4.741***
Net Portfolio Investment - Equity & Investment Fund Shares (Crisis-Excluded)	8.275	1.949***	3.857***	14.549***	21.981***	1.523***	1.853***
Net Other Investment (Crisis-Excluded)	32.520	3.663***	4.976***	16.491***	12.656***	8.704***	8.984***
Net Capital Flows (Crisis-Excluded)	19.763	2.003***	2.931***	17.466	14.049***	7.889***	7.965***

Interpretation: Standard deviations measure volatility levels. Stars indicate F-test significance for variance differences from Iceland: *** $p<0.01$, ** $p<0.05$, * $p<0.10$.
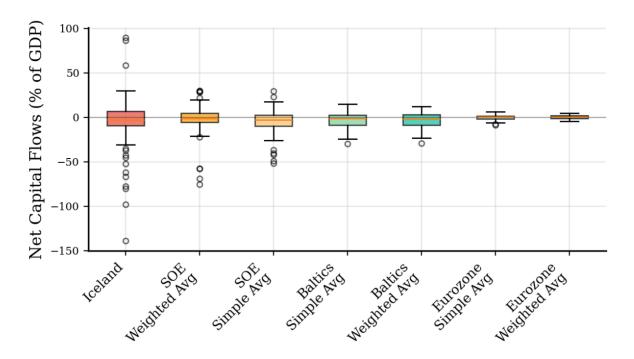
Color Coding:

- 🔴 **Red/Pink Background**: Iceland is MORE volatile than comparator (higher standard deviation)
- 🟢 **Green Background**: Iceland is LESS volatile than comparator (lower standard deviation)
- ⚪ **No Color**: No statistically significant difference

📊 Chart 1: Distribution Analysis - Full Period

Visual representation of volatility patterns across all comparator groups for Net Capital Flows
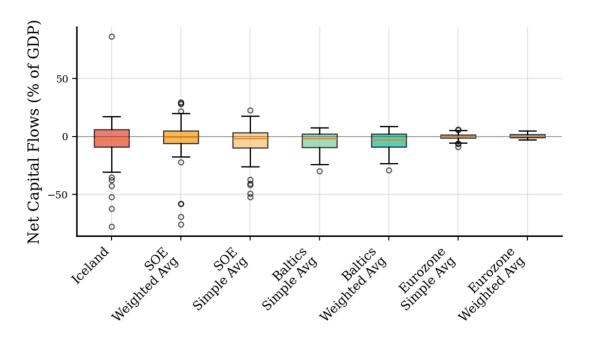
Net Capital Flows Distribution - Full Period (Ordered by Volatility)

📊 Chart 2: Distribution Analysis - Crisis-Excluded

Comparison showing volatility patterns with financial crisis periods removed

Net Capital Flows Distribution - Crisis-Excluded (Ordered by Volatility)
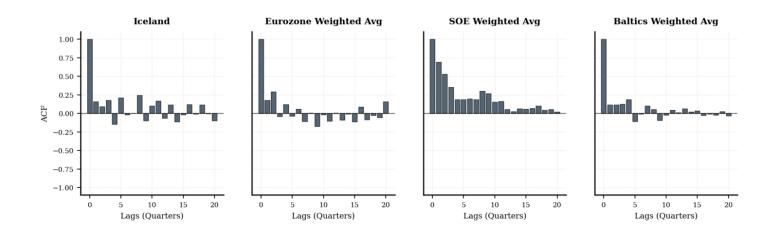

⏱ Table 2: Half-life Results (All Indicators)

Indicator/Period	Iceland	Eurozone Weighted Avg	Eurozone Simple Avg	SOE Weighted Avg	SOE Simple Avg	Baltics Weighted Avg	Baltics Simple Avg
Net Direct Investment (Full)	1	1	1	3	3	1	1
Net Portfolio Investment (Full)	1	1	1	1	1	1	1
Net Portfolio Investment - Debt Securities (Full)	1	1	1	1	1	1	1
Net Portfolio Investment - Equity & Investment Fund Shares (Full)	1	1	1	1	2	1	1
Net Other Investment (Full)	1	1	1	1	1	1	1
Net Capital Flows (Full)	1	1	1	1	1	1	1
Net Direct Investment (Crisis-Excluded)	1	1	1	4	3	1	1
Net Portfolio Investment (Crisis-Excluded)	1	1	1	1	1	1	1
Net Portfolio Investment - Debt Securities (Crisis-Excluded)	1	1	1	1	1	1	1
Net Portfolio Investment - Equity & Investment Fund Shares (Crisis-Excluded)	1	1	1	2	4	2	2
Net Other Investment (Crisis-Excluded)	1	1	1	1	1	1	1
Net Capital Flows (Crisis-Excluded)	1	1	1	2	1	1	1
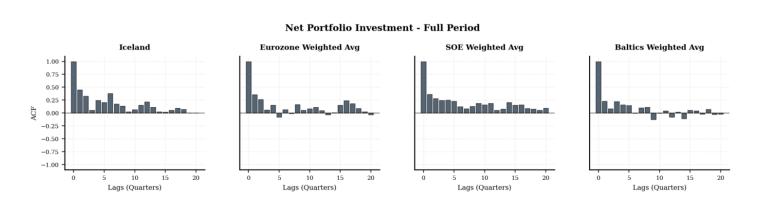
Interpretation: Half-life indicates shock persistence in quarters. Lower values (green) show faster mean reversion. Values of 1-3 quarters are typical for efficient financial markets.

📊 Charts 3-4: Comprehensive Autocorrelation Analysis
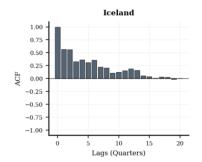
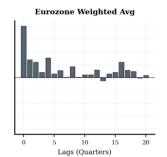ACF patterns across all indicators for both time periods (weighted averages only)
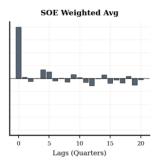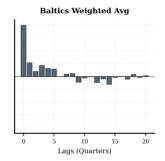
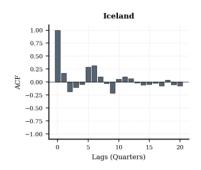## Full Period Analysis

Net Portfolio Investment - Full Period

Net Portfolio Investment - Debt Securities - Full Period
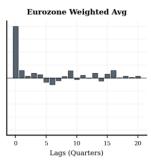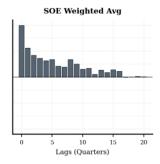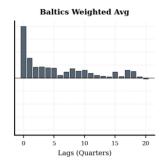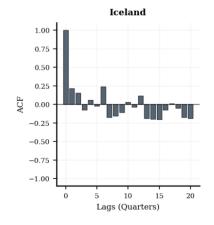

| Iceland | Eurozone Weighted Avg | SOE Weighted Avg | Baltics Weighted Avg |

Net Capital Flows - Full Period

| Iceland | Eurozone Weighted Avg | SOE Weighted Avg | Baltics Weighted Avg |

| Iceland | Eurozone Weighted Avg | SOE Weighted Avg | Baltics Weighted Avg |

Net Capital Flows - Full Period

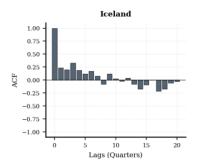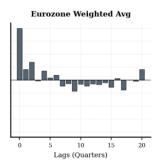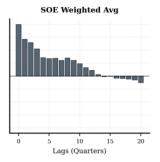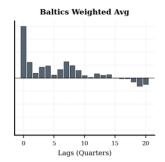| Iceland | Eurozone Weighted Avg | SOE Weighted Avg | Baltics Weighted Avg |
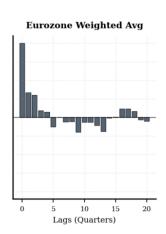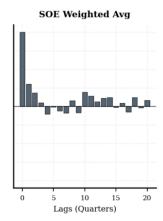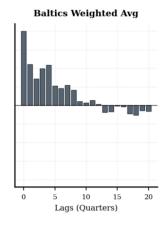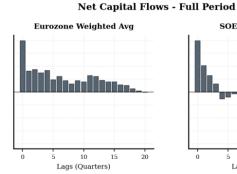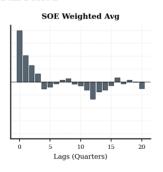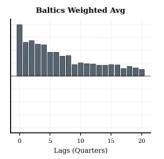
Crisis-Excluded Analysis

Net Direct Investment - Crisis-Excluded (Excludes 2008-2010, 2020-2022)

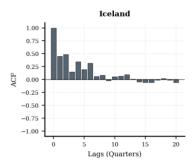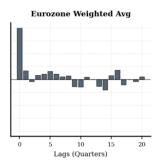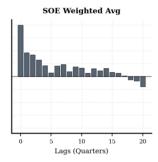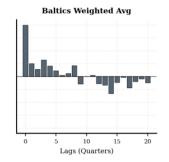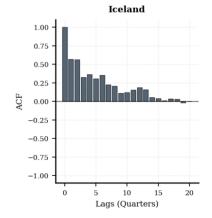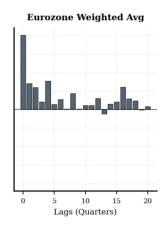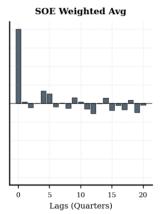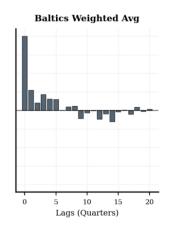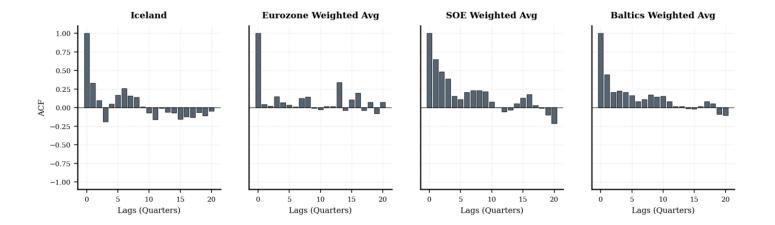**Net Portfolio Investment - Equity & Investment Fund Shares - Crisis-Excluded (Excludes 2008-2010, 2020-2022)**
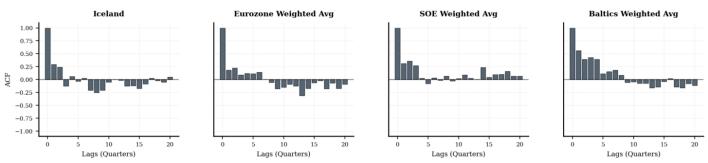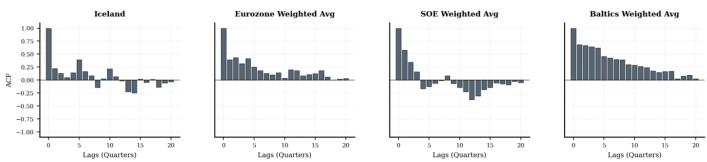
Net Other Investment - Crisis-Excluded (Excludes 2008-2010, 2020-2022)

Net Capital Flows - Crisis-Excluded (Excludes 2008-2010, 2020-2022)

📈 Table 3: RMSE Prediction Results (All Indicators)
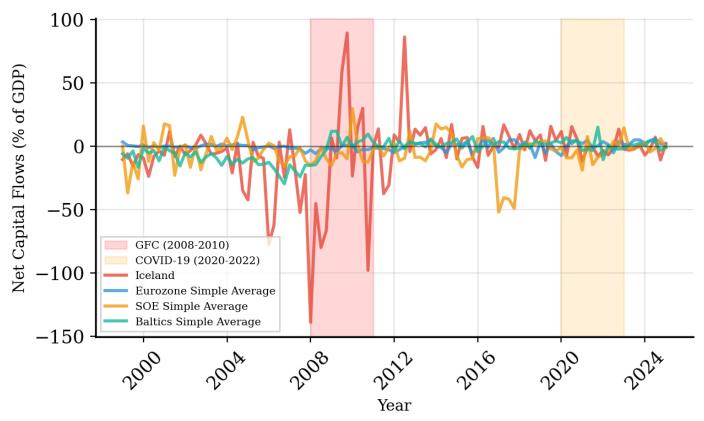
Indicator/Period	Iceland	Eurozone Weighted Avg	Eurozone Simple Avg	SOE Weighted Avg	SOE Simple Avg	Baltics Weighted Avg	Baltics Simple Avg
Net Direct Investment (Full)	15.33	0.99	1.78	13.93	10.76	3.48	4.49
Net Portfolio Investment (Full)	15.13	2.58	3.79	19.81	19.32	3.29	4.07
Net Portfolio Investment - Debt Securities (Full)	13.23	1.19	2.45	10.23	12.36	3.23	4.09
Net Portfolio Investment - Equity & Investment Fund Shares (Full)	7.34	1.68	3.09	12.69	14.33	1.14	1.50
Net Other Investment (Full)	4.95	3.06	4.27	16.43	13.43	9.18	10.13
Net Capital Flows (Full)	7.61	1.41	3.33	4.23	5.75	4.05	2.98
Net Direct Investment (Crisis-Excluded)	15.55	0.92	1.89	14.62	10.57	3.45	4.31
Net Portfolio Investment (Crisis-Excluded)	15.58	2.50	3.65	20.59	20.40	3.47	4.22
Net Portfolio Investment - Debt Securities (Crisis-Excluded)	13.23	1.19	2.45	10.23	12.36	3.23	4.09
Net Portfolio Investment - Equity & Investment Fund Shares (Crisis-Excluded)	6.87	1.61	2.95	14.80	18.40	1.18	1.64
Net Other Investment (Crisis-Excluded)	4.69	2.97	4.29	12.90	10.59	7.97	8.62
Net Capital Flows (Crisis-Excluded)	7.65	1.45	3.89	4.32	5.41	4.04	2.99

Interpretation: RMSE measures 4-quarter ahead prediction accuracy. Lower values indicate better forecastability. Compare across groups to assess relative prediction difficulty.

📊 Chart 5: Time-Series Analysis - Simple Averages

Net Capital Flows over time comparing Iceland with simple (unweighted) averages across country groups, with crisis periods marked

Net Capital Flows Over Time - Simple Averages Comparison

Legend:
- GFC (2008-2010)
- COVID-19 (2020-2022)
- Iceland
- Eurozone Simple Average
- SOE Simple Average
- Baltics Simple Average

📊 Chart 6: Time-Series Analysis - Weighted Averages

Net Capital Flows over time comparing Iceland with GDP-weighted averages across country groups, showing crisis impact

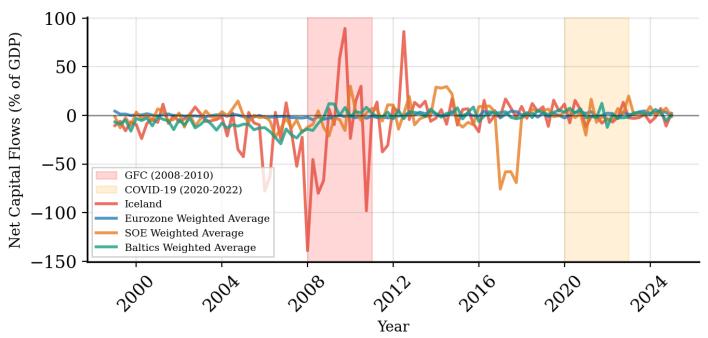Net Capital Flows Over Time - Weighted Averages Comparison

🔍 Summary Insights & Comprehensive Export

📊 Key Findings Across All 6 Indicators

- **Comprehensive Analysis:** Covers Net Direct Investment, Net Portfolio Investment (total & disaggregated), Net Other Investment, and Net Capital Flows

- **Volatility Patterns:** Iceland shows systematically different volatility compared to weighted averages of comparator groups

- **F-Test Results:** Statistical significance varies across indicators, with strongest differences in aggregated capital flows

- **Crisis Impact:** Crisis exclusion (2008-2010, 2020-2022) reduces volatility measures across all groups and indicators

- **Methodological Consistency:** Weighted vs simple average comparisons reveal different patterns across indicator types

⏱️ Temporal Dynamics Across Indicators

- **Half-Life Analysis:** All 6 indicators show varying persistence patterns, with most exhibiting 1-3 quarter half-lives

- **ACF Patterns:** 12 comprehensive panels (6 indicators × 2 periods) reveal different autocorrelation structures

- **Prediction Accuracy:** RMSE varies significantly across indicators, with Direct Investment showing different patterns than Portfolio flows

- **Model Performance:** AR(4) models capture temporal dynamics effectively across Full and Crisis-Excluded periods

- **Crisis Effects:** Crisis exclusion improves model fit and reduces prediction errors for most capital flow types

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📁 Master Tables Export

Download comprehensive statistical results in Excel format with all 3 master tables and metadata.

📊 **Complete Analysis Summary:** All master tables have been processed and are displayed above for PDF export compatibility.