



# Comparative Analysis: Iceland and SOEs

## Capital Flow Volatility Patterns (1999-2025)

**Research Focus:** How do capital flow volatility patterns compare between Iceland and other small open economies with similar characteristics?

**Methodology:** Cross-sectional comparison of capital flow patterns between Iceland and comparable small open economies from 1999-2025.

**Key Hypothesis:** Iceland and other small open economies may exhibit different capital flow volatility patterns despite similar economic structures and currency regimes.



## Data and Methodology

### Data Sources

- **Balance of Payments Data:** IMF, quarterly frequency (1999-2025)
- **GDP Data:** IMF World Economic Outlook, annual frequency
- **Countries:** Iceland vs 6 SOEs (Aruba, Bahamas, Brunei Darussalam, Malta, Mauritius, Seychelles)

### Data Limitations

- **Bermuda Exclusion:** Originally planned as 7th SOE country but excluded due to missing GDP data in IMF WEO database
- **GDP Dependency:** All indicators require GDP normalization for cross-country comparability

## Methodology

1. **Data Normalization:** All BOP flows converted to annualized % of GDP
2. **Statistical Analysis:** F-tests for variance equality without directional assumptions
3. **Volatility Measures:** Standard deviation, coefficient of variation, comparative patterns
4. **Comparative Framework:** Neutral analysis of volatility differences between similar economies

## Time Period Coverage

- **Full Analysis Period:** 1999-2025 (all available data)
- **Crisis Exclusion Analysis:** Excludes Global Financial Crisis (2008-2010) and COVID-19 (2020-2022)

✓ Loaded CS3 data: 763 observations, 11 indicators

## Full Time Period Analysis

*Complete temporal analysis using all available data*

✓ Loaded CS3 data: 763 observations, 14 indicators

Observations	Indicators	Countries	Time Period
763	14	7	1999-2025

## Overall Capital Flows Analysis

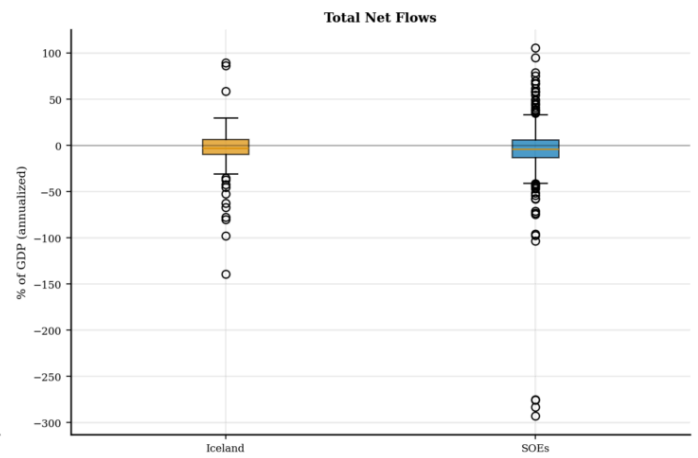
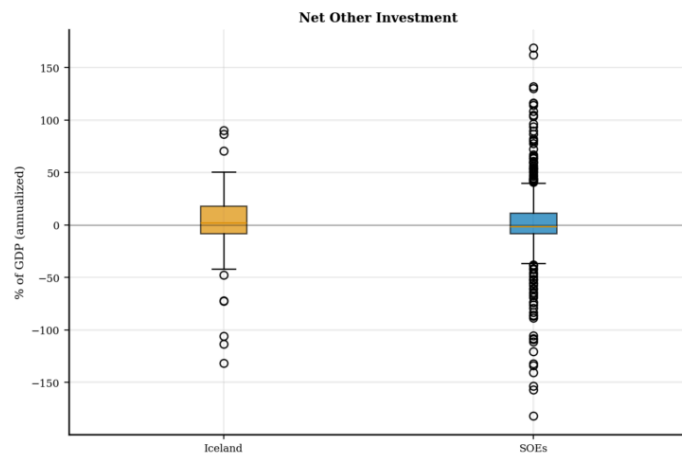
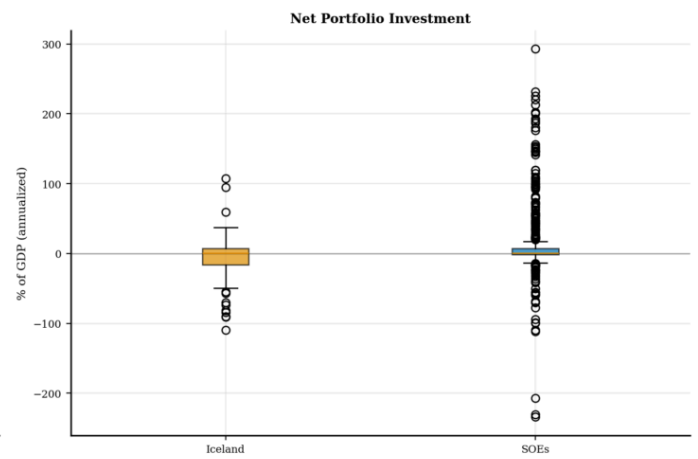
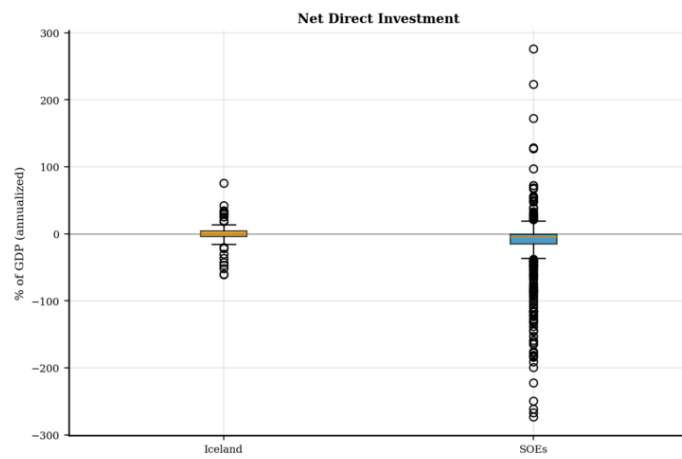
*High-level summary of aggregate net capital flows before detailed disaggregated analysis*

✓ Loaded CS3 data: 763 observations, 14 indicators

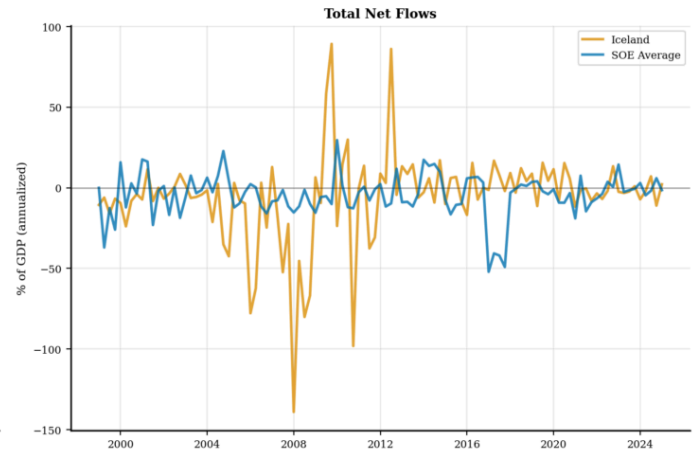
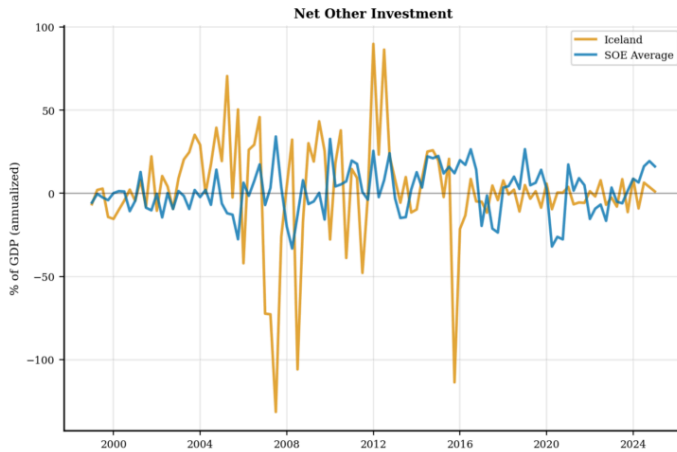
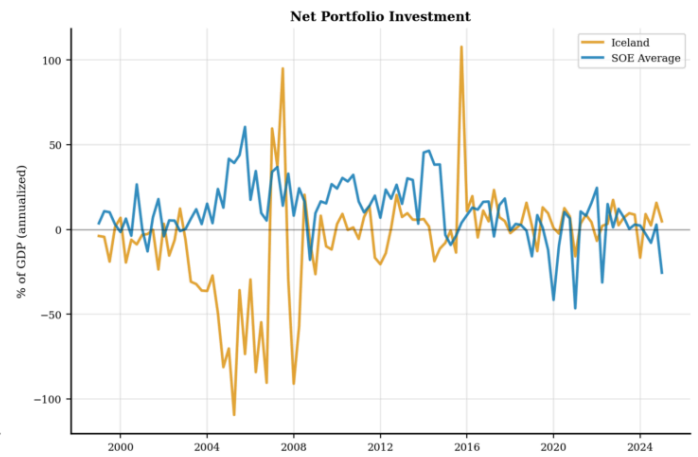
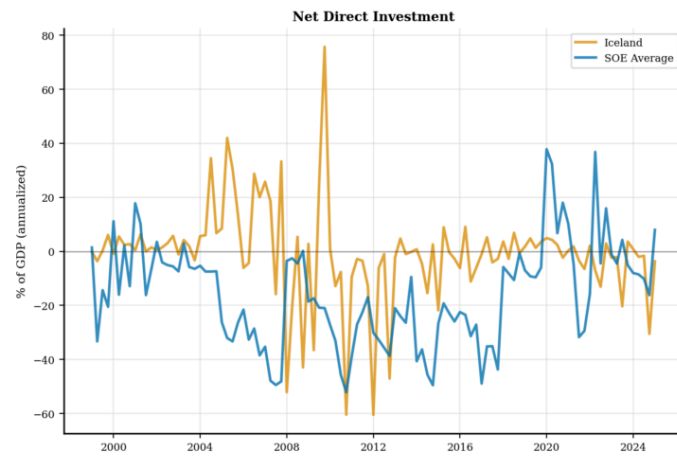
## Summary Statistics by Group

Indicator,	Mean, Iceland	Mean, Small ...	Median, Iceland	Median, Small...	Std Dev, Iceland	Std Dev, Smal...
Net Direct Investment	-0.83	-16.77	0.29	-4.55	18.04	48.70
Net Other Investment	1.48	1.30	1.98	-1.33	31.84	35.44
Net Portfolio Investment	-6.42	11.47	0.49	0.76	31.12	48.63
Total Net Flows	-5.77	-4.42	-2.76	-4.22	28.63	32.00

## Distribution Comparison by Group



 **Time Series by Group**




## Key Insights

### Volatility Comparison (Standard Deviation)

- **Net Direct Investment:** SOE 2.7x more volatile
- **Net Portfolio Investment:** SOE 1.6x more volatile
- **Net Other Investment:** Similar volatility levels
- **Total Net Flows:** Similar volatility levels

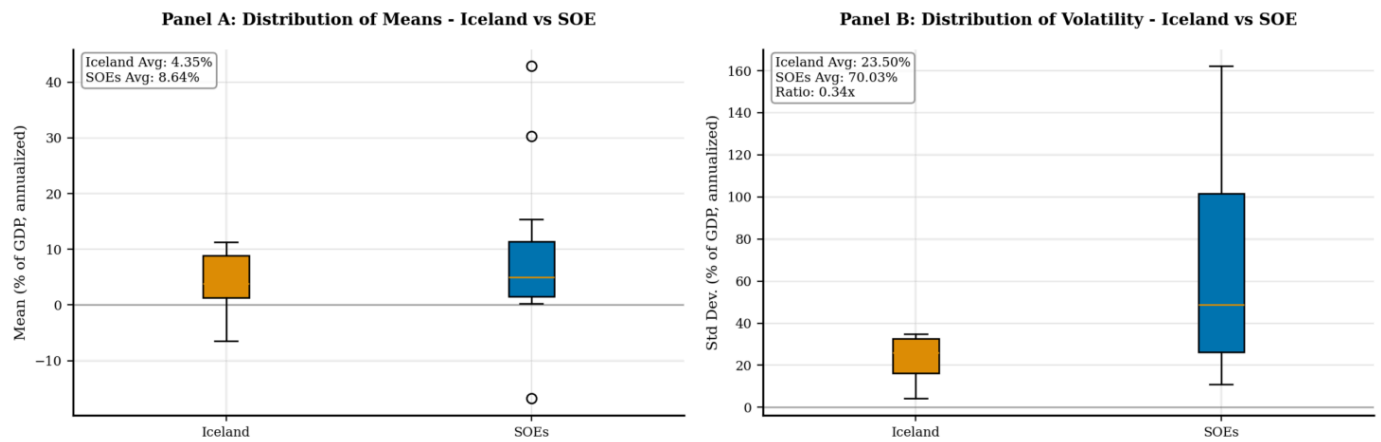
### Overall Pattern

-  **Similar volatility levels** between Iceland and SOEs

## Indicator-level Analysis

*Detailed analysis by individual capital flow indicators*

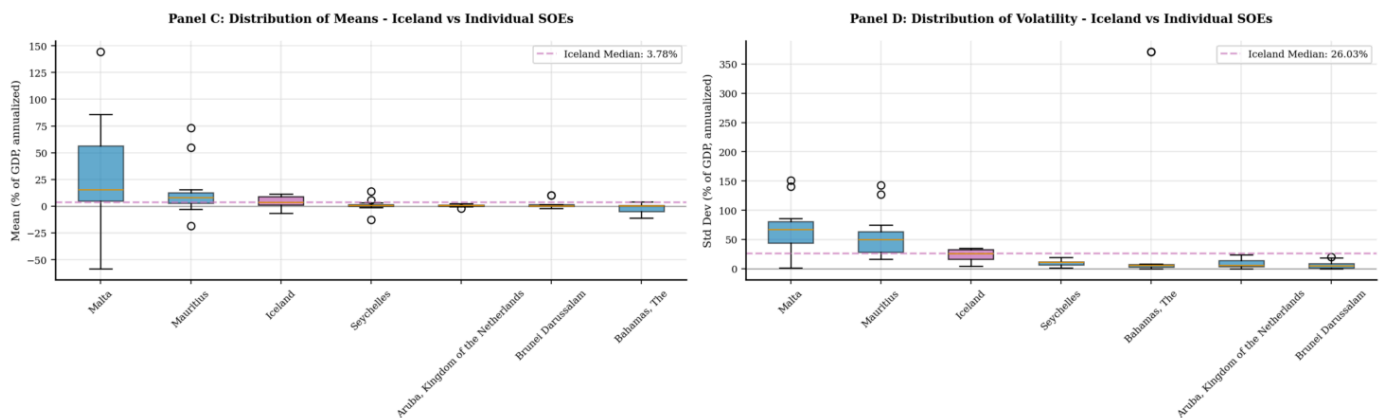
# 1. Summary Statistics and Boxplots



**Volatility Comparison:** Iceland volatility is 0.34x higher than SOEs on average

## 1b. Individual Country Comparisons: Iceland vs Each Small Open Economy

**Enhanced Analysis:** Rather than comparing Iceland to SOEs as an aggregate group, this section compares Iceland's values to each individual SOE separately.



## Disaggregated Analysis (Sections 2-6)

*Detailed analysis by individual capital flow indicators*

## 2. Comprehensive Statistical Summary Table

All Indicators - Iceland vs SOEs Statistics

Indicator	Iceland Mean	Iceland Std Dev	Iceland CV%	SOE Mean	SOE Std Dev	SOE CV%	CV Ratio (Iceland/...
Assets - Direct Investment	3.10	23.05	742.2	30.30	94.25	311.0	2.39
Assets - Other Investment (Debt)	7.97	34.77	436.5	7.57	162.22	2142.1	0.20
Assets - Other Investment (Banks)	10.35	29.01	280.4	0.29	158.85	55478.9	0.01
Assets - Portfolio (Debt)	1.21	12.96	1067.6	4.95	20.62	416.1	2.57
Assets - Portfolio (Equity)	3.62	9.93	274.0	11.30	44.34	392.4	0.70
Assets - Portfolio (Total)	4.84	18.45	381.4	15.37	50.65	329.6	1.16
Liabilities - Direct Investment	3.94	15.71	398.9	42.89	104.19	242.9	1.64
Liabilities - Other Investment (Banks)	9.16	33.15	361.9	1.96	159.19	8128.1	0.04
Liabilities - Portfolio (Debt)	11.07	32.85	296.8	1.37	10.92	798.4	0.37
Liabilities - Portfolio (Equity)	0.19	4.22	2234.6	4.01	19.45	484.9	4.61
Liabilities - Portfolio (Total)	11.26	33.88	300.9	4.96	22.98	463.5	0.65
Net - Direct Investment	-0.83	18.04	2165.0	-16.77	48.70	290.4	7.46
Net - Other Investment	1.48	31.84	2147.9	1.30	35.44	2724.8	0.79
Net - Portfolio Investment	-6.42	31.12	484.6	11.47	48.63	423.8	1.14

**Summary:** Statistics for all 14 capital flow indicators. CV% = Coefficient of Variation (Std Dev / |Mean| × 100). Higher CV% indicates greater volatility relative to mean.

### 3. Hypothesis Testing Results

F-Tests for Variance Equality Between Iceland and SOEs |  $H_0$ : Equal volatility patterns |  $H_1$ : Different volatility patterns |  $\alpha = 0.05$

Indicator	F-Statistic	P-Value	Significance	More Volatile
Assets - Other Investment (Banks)	29.98	0.0000	***	Small Open Econo...
Assets - Other Investment (Debt)	21.76	0.0000	***	Small Open Econo...
Assets - Portfolio (Equity)	19.94	0.0000	***	Small Open Econo...
Assets - Portfolio (Debt)	2.53	0.0000	***	Small Open Econo...
Assets - Direct Investment	16.73	0.0000	***	Small Open Econo...
Assets - Portfolio (Total)	7.54	0.0000	***	Small Open Econo...
Liabilities - Other Investment (Banks)	23.05	0.0000	***	Small Open Econo...
Liabilities - Portfolio (Equity)	21.26	0.0000	***	Small Open Econo...
Liabilities - Portfolio (Total)	2.17	0.0000	***	Iceland
Liabilities - Portfolio (Debt)	9.04	0.0000	***	Iceland
Liabilities - Direct Investment	43.99	0.0000	***	Small Open Econo...
Net - Direct Investment	7.29	0.0000	***	Small Open Econo...
Net - Portfolio Investment	2.44	0.0000	***	Small Open Econo...
Net - Other Investment	1.24	0.1761		Small Open Econo...

- Legend:**
- F-Statistic:** Ratio of variances
  - P-Value:** Statistical significance
  - More Volatile:** Which group exhibits greater volatility

Significance levels: \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

Iceland More Volatile

2/14  
 ↑ 14.3%

Significant (5%)

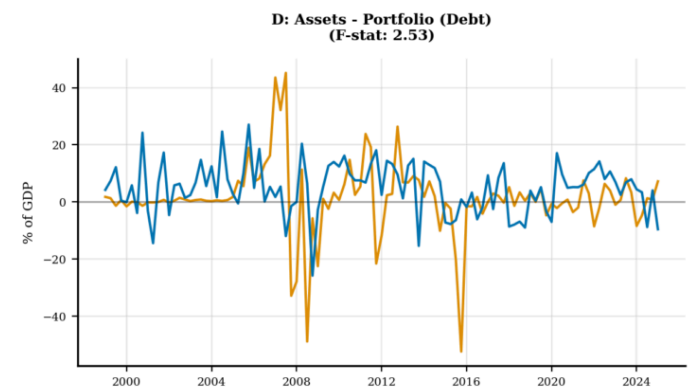
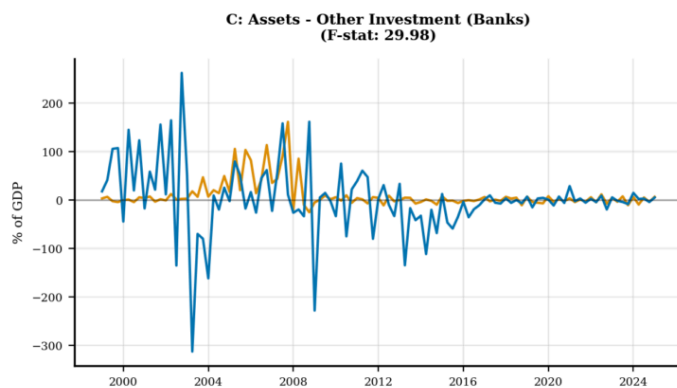
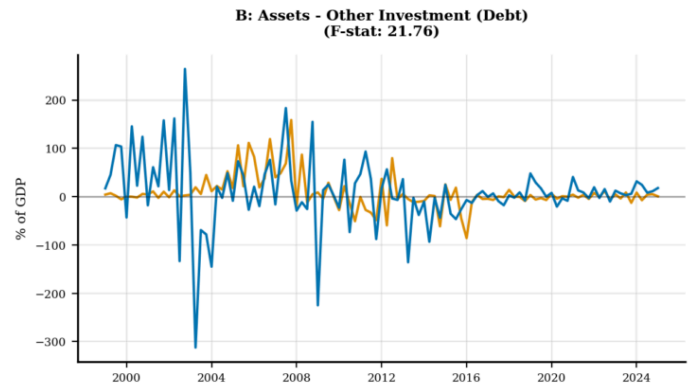
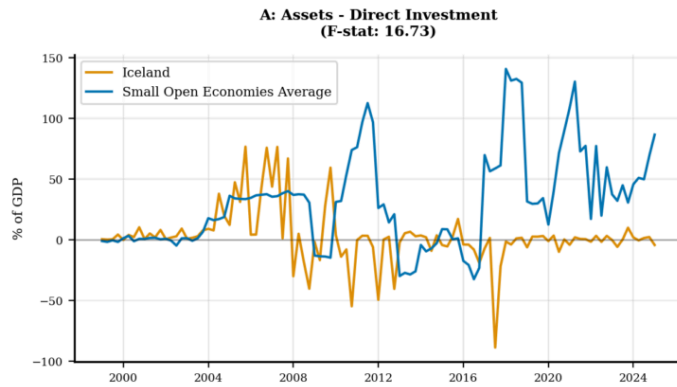
13/14  
 ↑ 92.9%

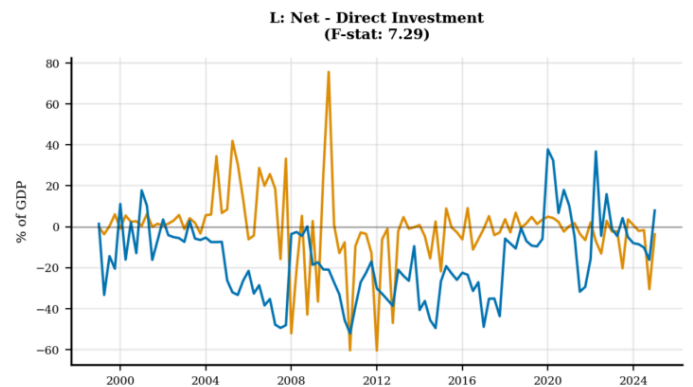
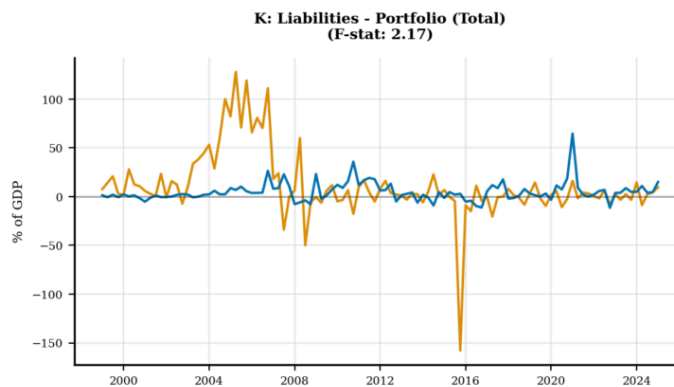
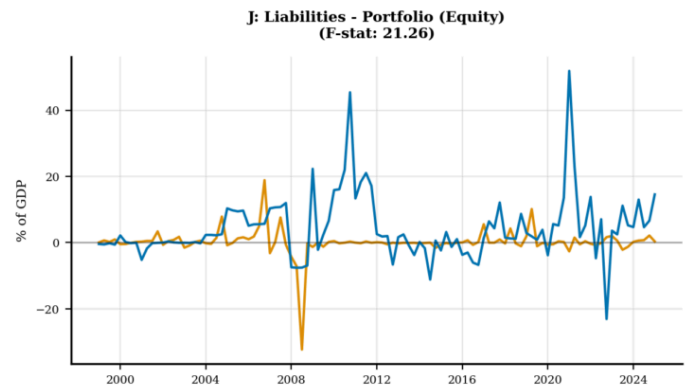
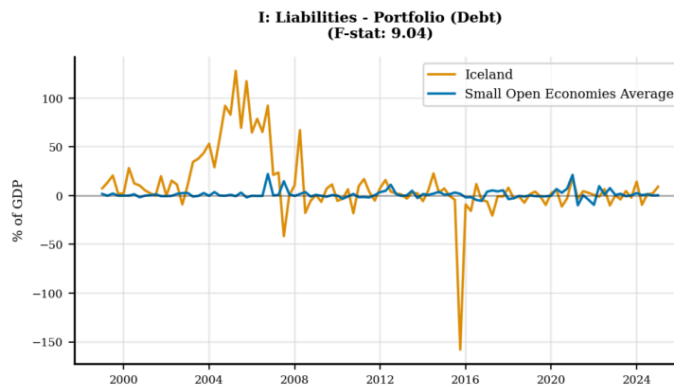
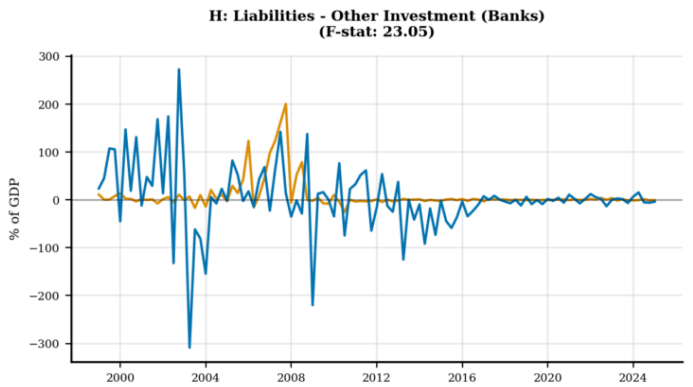
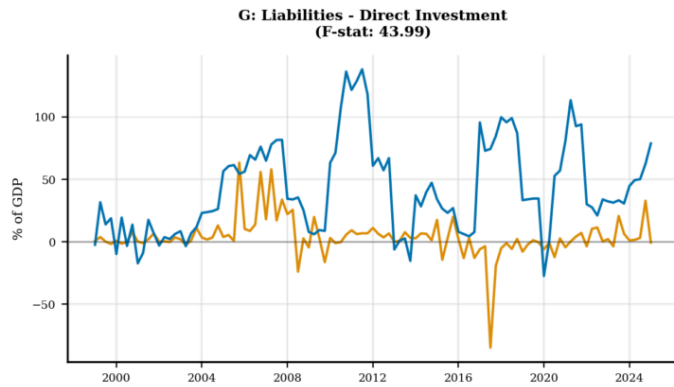
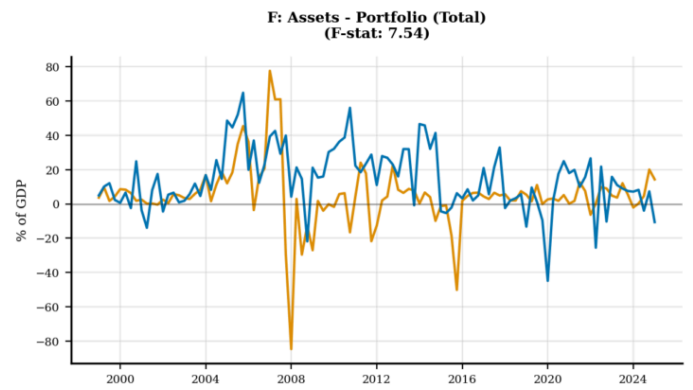
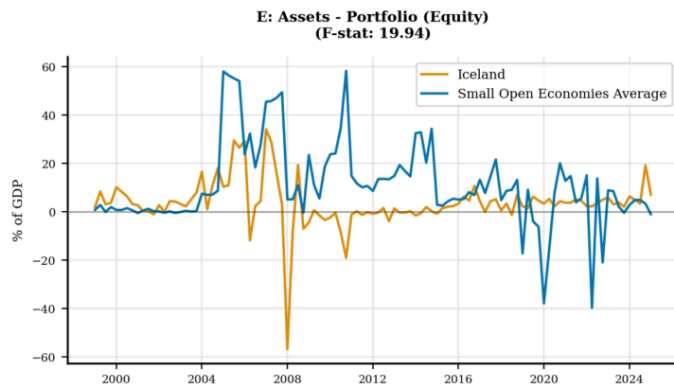
Significant (1%)

13/14  
 ↑ 92.9%

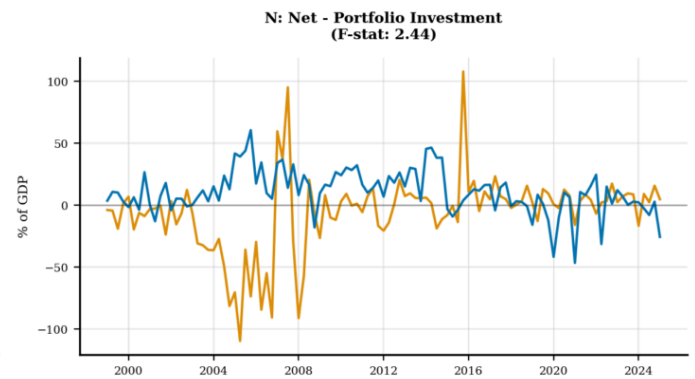
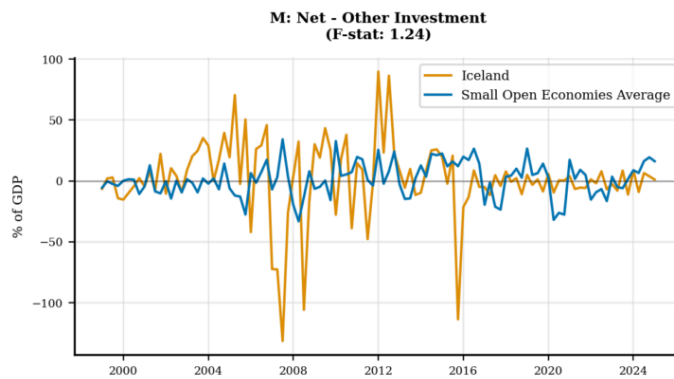
**Conclusion:** Small Open Economies show higher volatility than Iceland in other small open economies across capital flow indicators.

## 4. Time Series Analysis









## 5. Key Findings Summary

### Statistical Evidence:


- **14.3% of capital flow indicators** show higher volatility in Iceland
- **92.9% of indicators** show statistically significant differences ( $p < 0.05$ )
- **Volatility ratio (Iceland/SOE):** 0.34x
- **Pattern analysis:** Capital flow volatility patterns are relatively similar between the two groups

### Statistical Context:

- **Sample characteristics:** Both groups classified as small open economies
- **Data quality:** Full quarterly time series coverage
- **Methodological approach:** F-tests for variance equality comparison
- **Result interpretation:** Statistical differences observed in volatility patterns across groups

## Excluding Financial Crises

*Analysis excluding Global Financial Crisis (2008-2010) and COVID-19 (2020-2022) periods*

 Loaded CS3 data: 571 observations, 14 indicators

Observations

Indicators

Countries

571

14

7



## Overall Capital Flows Analysis (Crisis-Excluded)

*High-level summary of aggregate net capital flows excluding crisis periods*



Loaded CS3 data: 571 observations, 14 indicators



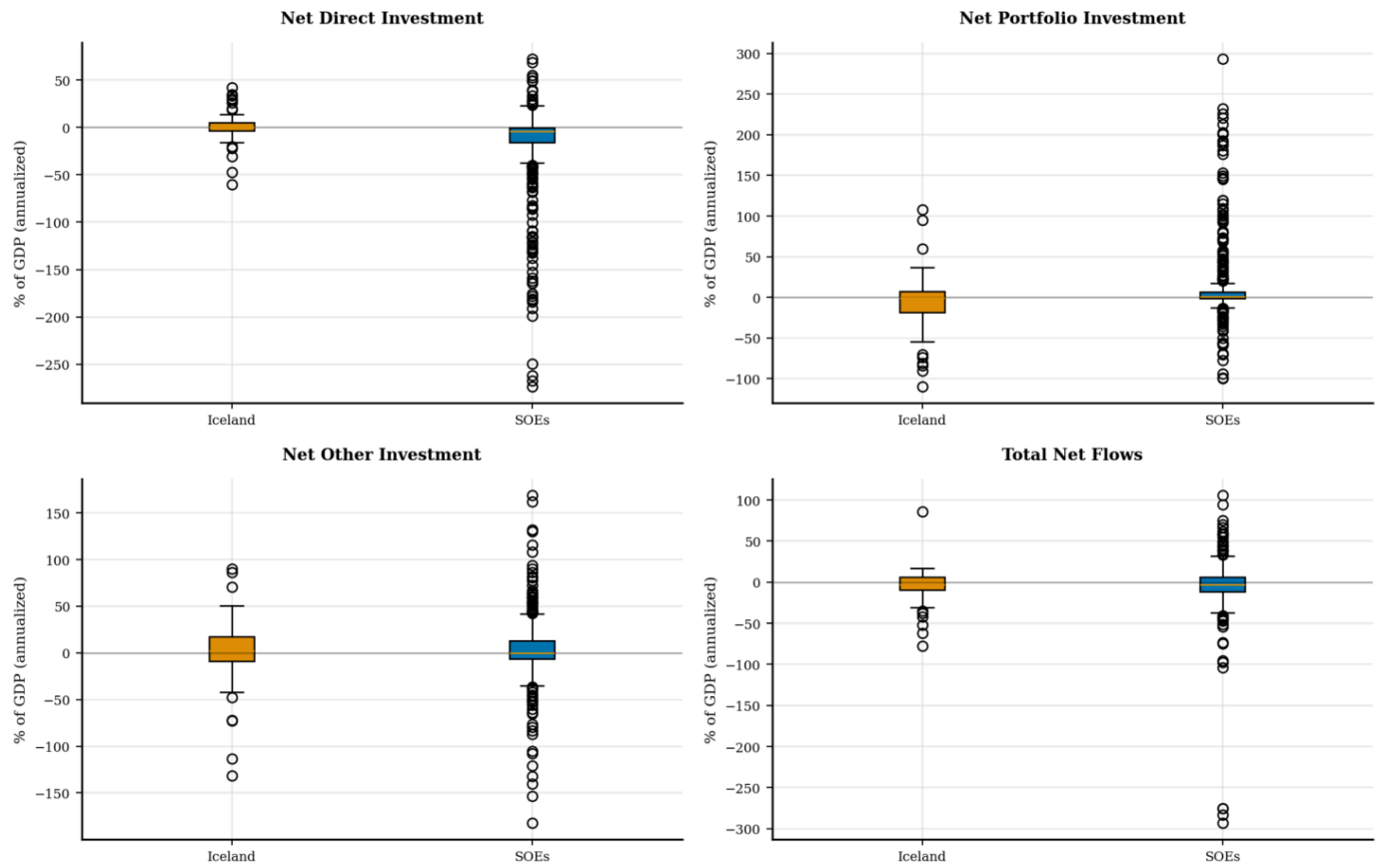
## Summary Statistics by Group (Crisis-Excluded)

Indicator,	Mean, Iceland	Mean, Small ...	Median, Iceland	Median, Small...	Std Dev, Iceland	Std Dev, Smal...
Net Direct Investment	0.61	-19.89	0.29	-4.26	14.56	46.86
Net Other Investment	1.87	3.56	2.19	0.11	32.52	34.29
Net Portfolio Investment	-6.76	12.89	-0.57	0.67	33.03	47.77
Total Net Flows	-4.28	-4.06	-2.76	-2.96	19.76	35.25



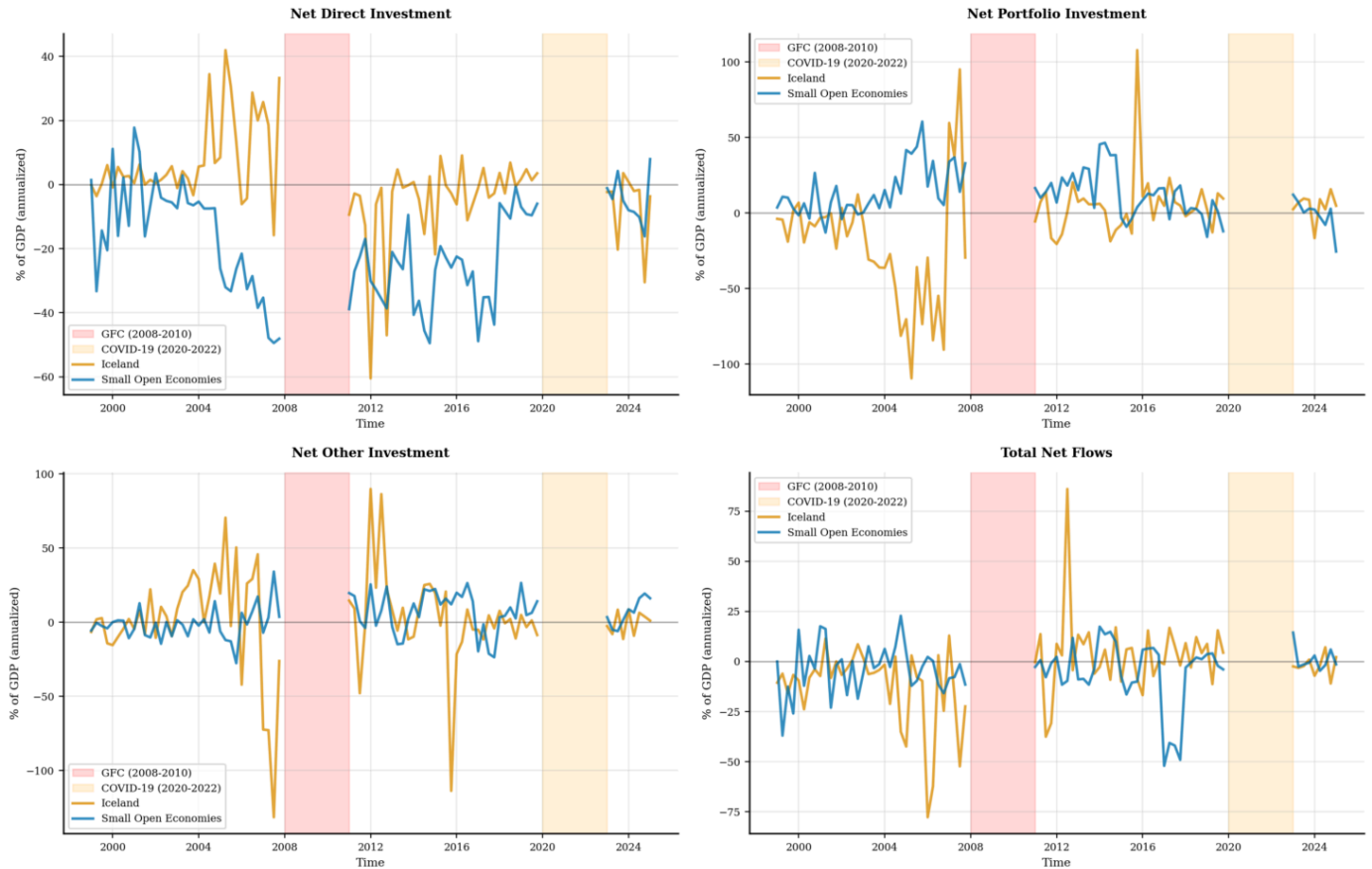
## Distribution Comparison by Group (Crisis-Excluded)

## Overall Capital Flows Distribution by Group (Crisis-Excluded)



## Time Series by Group (Crisis-Excluded)

## Overall Capital Flows Time Series by Group (Crisis-Excluded)



## Key Insights (Crisis-Excluded)

### Volatility Comparison (Crisis-Excluded)

- **Net Direct Investment:** SOE 3.2x more volatile
- **Net Portfolio Investment:** Similar volatility levels
- **Net Other Investment:** Similar volatility levels
- **Total Net Flows:** SOE 1.8x more volatile

### Overall Pattern (Crisis-Excluded)

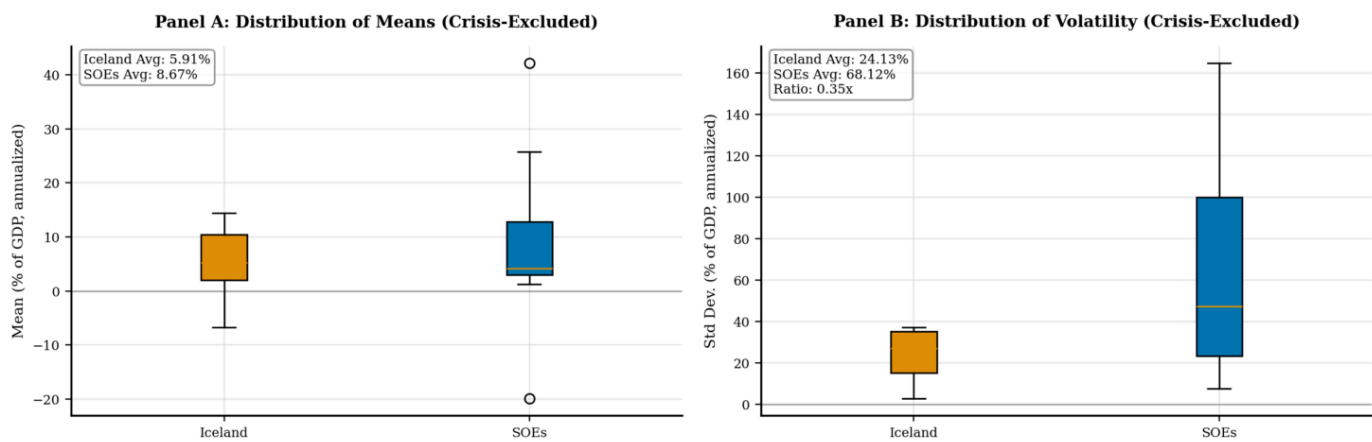
- **Similar volatility levels** when crisis periods are excluded

## Indicator-level Analysis (Crisis-Excluded)

*Detailed analysis by individual capital flow indicators excluding crisis periods*

## 1. Summary Statistics and Boxplots (Crisis-

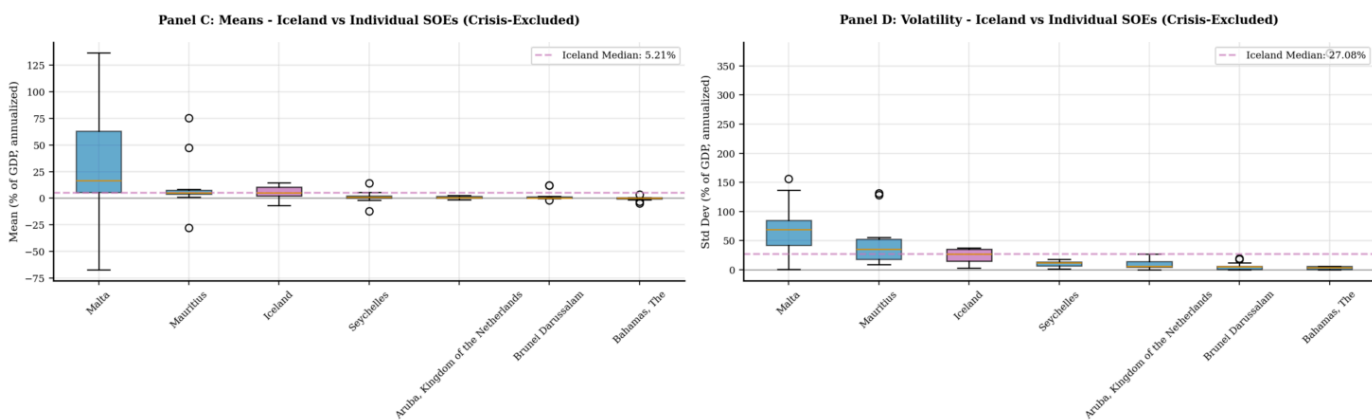
# Excluded)



**Volatility Comparison:** Iceland volatility is 0.35x higher than SOEs on average (excluding crisis periods)

## 1b. Individual Country Comparisons: Iceland vs Each Small Open Economy (Crisis-Excluded)

**Enhanced Analysis:** Comparing Iceland to each individual SOE separately, excluding crisis periods to focus on normal market conditions.



## 2. Comprehensive Statistical Summary Table (Crisis-Excluded)

All Indicators - Iceland vs SOEs Statistics (Crisis-Excluded)

Indicator	Iceland Mean	Iceland Std Dev	Iceland CV%	SOE Mean	SOE Std Dev	SOE CV%	CV Ratio (Iceland/...
Assets - Direct Investment	5.15	23.24	451.2	25.76	91.64	355.7	1.27
Assets - Other Investment (Debt)	9.84	37.27	378.6	10.46	164.69	1574.2	0.24
Assets - Other Investment (Banks)	12.72	30.93	243.2	2.18	160.75	7362.7	0.03
Assets - Portfolio (Debt)	2.38	12.67	531.9	4.11	19.57	476.0	1.12
Assets - Portfolio (Equity)	5.27	7.91	150.2	12.55	42.04	334.9	0.45
Assets - Portfolio (Total)	7.65	17.08	223.3	15.78	49.25	312.1	0.72
Liabilities - Direct Investment	4.54	16.82	370.4	42.17	102.67	243.4	1.52
Liabilities - Other Investment (Banks)	10.66	36.07	338.4	4.22	160.98	3817.2	0.09
Liabilities - Portfolio (Debt)	13.58	36.03	265.2	1.20	7.64	635.8	0.42
Liabilities - Portfolio (Equity)	0.83	2.89	348.9	2.72	11.33	415.9	0.84
Liabilities - Portfolio (Total)	14.41	36.83	255.6	3.66	14.21	387.8	0.66
Net - Direct Investment	0.61	14.56	2392.1	-19.89	46.86	235.6	10.15
Net - Other Investment	1.87	32.52	1737.5	3.56	34.29	962.0	1.81
Net - Portfolio Investment	-6.76	33.03	488.3	12.89	47.77	370.5	1.32

**Summary (Crisis-Excluded):** Statistics for all 14 capital flow indicators. CV% = Coefficient of Variation (Std Dev / |Mean| × 100). Higher CV% indicates greater volatility relative to mean.

### 3. Hypothesis Testing Results (Crisis-Excluded)

F-Tests for Variance Equality Between Iceland and SOEs (Crisis-Excluded) |  $H_0$ : Equal volatility patterns |  $H_1$ : Different volatility patterns |  $\alpha = 0.05$

Indicator	Iceland Std Dev	SOE Std Dev	F-Statistic	P-Value	Sig.
Assets - Other Investment (Banks)	30.930	160.750	27.010	0.0000	***
Liabilities - Other Investment (Banks)	36.067	160.978	19.921	0.0000	***
Assets - Other Investment (Debt)	37.270	164.693	19.526	0.0000	***
Liabilities - Portfolio (Equity)	2.889	11.330	15.376	0.0000	***
Liabilities - Portfolio (Total)	36.832	14.213	6.716	0.0000	***
Assets - Portfolio (Equity)	7.912	42.040	28.234	0.0000	***
Liabilities - Portfolio (Debt)	36.029	7.641	22.235	0.0000	***
Net - Direct Investment	14.556	46.861	10.364	0.0000	***
Net - Portfolio Investment	33.027	47.765	2.092	0.0001	***
Liabilities - Direct Investment	16.823	102.670	37.246	0.0000	***
Assets - Portfolio (Debt)	12.665	19.568	2.387	0.0000	***
Assets - Direct Investment	23.236	91.642	15.555	0.0000	***
Assets - Portfolio (Total)	17.079	49.252	8.316	0.0000	***
Net - Other Investment	32.520	34.293	1.112	0.5691	

# 4. Time Series Analysis (Crisis-Excluded)

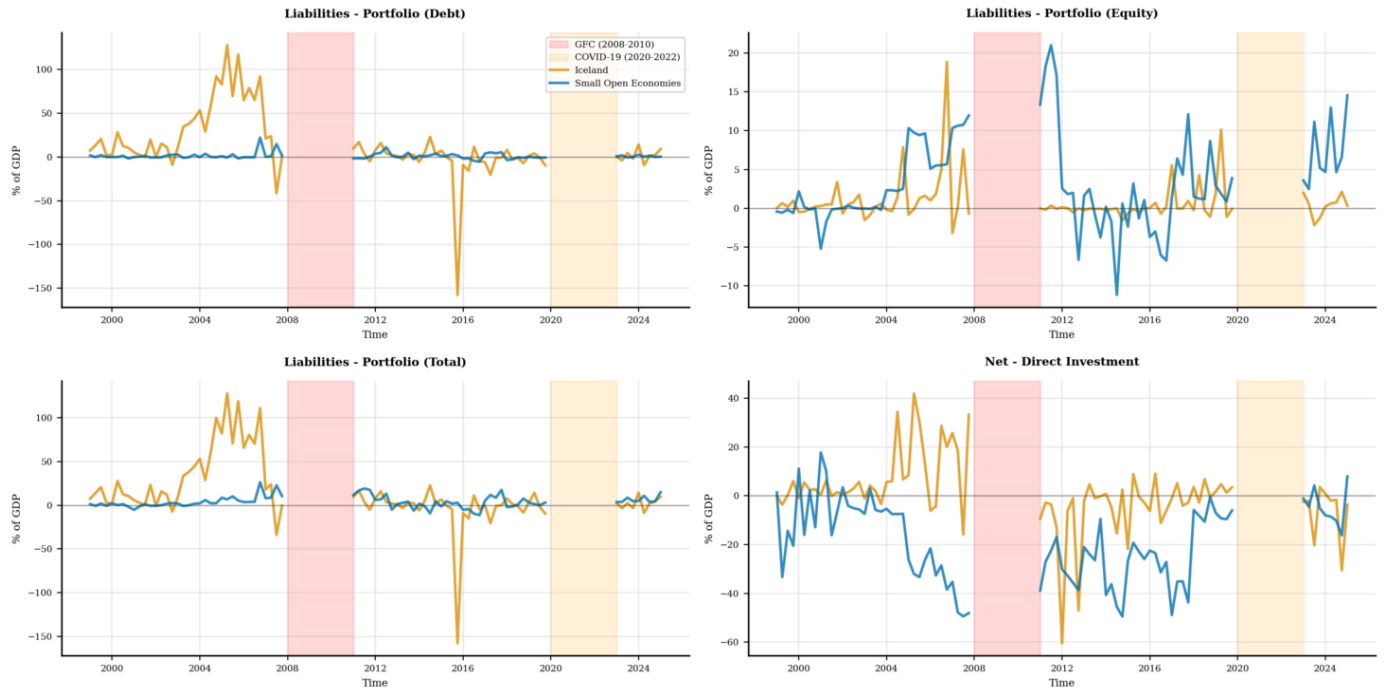
Capital Flow Time Series - Group 1 (Crisis-Excluded)



Capital Flow Time Series - Group 2 (Crisis-Excluded)



### Capital Flow Time Series - Group 3 (Crisis-Excluded)



### Capital Flow Time Series - Group 4 (Crisis-Excluded)



**Note:** Red shaded areas indicate crisis periods (2008-2010 GFC, 2020-2022 COVID-19) that are excluded from the crisis-excluded analysis. Time series shows patterns during normal market conditions.

## 5. Key Findings Summary (Crisis-Excluded)

### Statistical Evidence (Crisis-Excluded):

### Methodological Notes:

- Crisis periods excluded: 2008-2010 (GFC) and 2020-2022 (COVID-19)



- **14.3% of capital flow indicators** show higher volatility in Iceland
- **92.9% of indicators** show statistically significant differences ( $p < 0.05$ )
- **Volatility ratio (Iceland/SOE):** 0.35x (excluding crisis periods)
- **Pattern analysis:** Non-crisis volatility patterns are relatively similar between groups
- **Comparison basis:** Similar small open economy structures
- **Statistical approach:** F-test for variance equality without directional assumptions
- **Interpretation:** Focus on pattern differences rather than superiority/inferiority

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## 6. Analysis Summary (Crisis-Excluded)

Complete analysis results are displayed above in the comprehensive tables and visualizations.

This crisis-excluded analysis provides insights into normal market volatility patterns by removing periods of exceptional global financial stress (2008-2010 GFC and 2020-2022 COVID-19).



### Summary

**Statistics Displayed**  
in Section 4 tables  
above



### Statistical Tests

F-test results  
shown in analysis  
sections



### Group

**Comparisons**  
Comprehensive  
results in  
visualizations  
above



### Complete

**Analysis** All results  
integrated in this  
report