🛡️ 🇪🇪 Estonia Euro Adoption Analysis (Outlier-Adjusted)

Capital Flow Volatility Before and After Euro Adoption (2011)

Research Focus: How did Euro adoption affect Estonia's capital flow volatility?

Methodology: Temporal comparison of capital flow patterns before (2005-2010) and after (2012-2017) Euro adoption.

📋 **Outlier-Adjusted Analysis:** This analysis uses 5% symmetric winsorization to assess the robustness of statistical findings to extreme values. Data points below the 5th percentile are replaced with the 5th percentile value; data points above the 95th percentile are replaced with the 95th percentile value.

Key Hypothesis: Euro adoption reduces capital flow volatility through enhanced monetary credibility.

📋 Data and Methodology

💡 **Tip:** You can print this page to PDF using your browser's print function for a professional document with proper margins.

📊 Full Time Period Analysis

Complete temporal analysis using all available data

📈 Overall Capital Flows Analysis

Aggregate net capital flows summary - Full Series

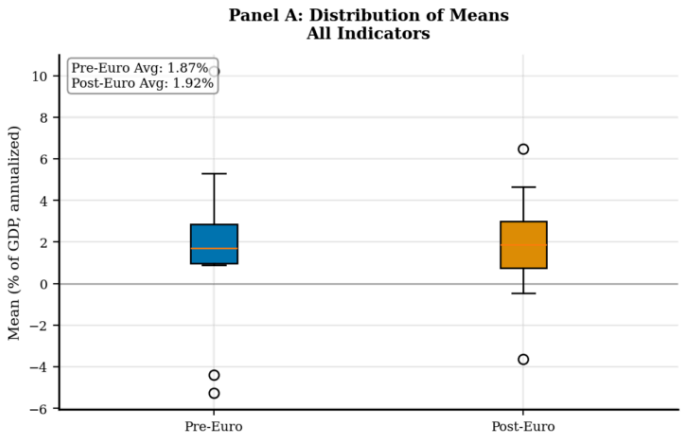
Failed to load overall capital flows data.

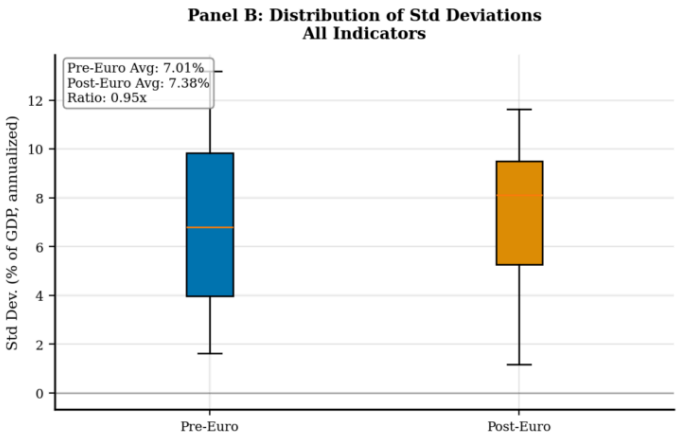
🔍 Indicator-Level Analysis

Estonia Analysis (Full Series): Euro adoption on 2011-01-01

- **Pre-Euro Period:** 1999 to 2010
- **Post-Euro Period:** 2011 to 2025 (includes adoption year 2011)

1. Summary Statistics and Boxplots





Download Combined Boxplots (PNG)

Download Std Dev Boxplot (PNG)

Means Across All Indicators:

- Pre-Euro: 1.87% (median: 1.69%)
- Post-Euro: 1.92% (median: 1.87%)

Standard Deviations Across All Indicators:

- Pre-Euro: 7.01% (median: 6.79%)
- Post-Euro: 7.38% (median: 8.10%)

Volatility Impact: Euro adoption increased average volatility by 5.3%

---

2. Comprehensive Statistical Summary Table

Estonia - Pre-Euro vs Post-Euro Statistics

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

Indicator	Pre-Euro Mean	Pre-Euro Std...	Pre-Euro CV%	Post-Euro M...	Post-Euro St...	Post-Euro C...	CV Ratio (Pr...
Assets - Direct Investment	4.96	3.76	75.8	3.04	8.67	285.1	0.27
Liabilities - Direct Investment	10.22	7.85	76.8	6.47	9.77	151.1	0.51
Net - Direct Investment	-5.26	6.93	131.7	-3.63	7.76	213.8	0.62
Assets - Portfolio (Total)	2.68	4.39	163.6	4.65	8.64	185.8	0.88
Liabilities - Portfolio (Total)	1.67	6.64	397.1	1.71	4.54	266.4	1.49
Net - Portfolio Investment	1.69	9.82	581.6	2.90	8.10	279.4	2.08
Assets - Portfolio (Debt)	1.75	3.82	218.8	2.82	8.10	287.3	0.76
Liabilities - Portfolio (Debt)	1.11	6.45	580.8	1.70	4.31	253.6	2.29
Assets - Portfolio (Equity)	0.93	1.64	176.1	1.91	2.46	128.9	1.37
Liabilities - Portfolio (Equity)	0.89	2.77	311.3	0.12	1.17	968.5	0.32
Net - Other Investment	-4.38	13.19	301.2	1.82	11.63	637.6	0.47
Assets - Other Investment (Debt)	2.91	10.04	344.7	3.35	10.85	323.7	1.07
Assets - Other Investment (Banks)	1.70	9.83	579.2	0.45	9.93	2210.3	0.26
Liabilities - Other Investment (Ban...	5.31	11.04	208.0	-0.45	7.42	1643.3	0.13

Summary: Statistics for all 14 capital flow indicators comparing pre and post Euro adoption periods.

- **CV% = Coefficient of Variation** (Std Dev/Mean × 100) - measures relative volatility
- **Average CV Ratio:** 0.89 - values >1 indicate higher pre-Euro volatility
- **Indicators with higher pre-Euro volatility:** 5/14 (35.7%)

---

3. Hypothesis Testing Results

F-Tests for Equal Variances: Estonia Pre-Euro vs Post-Euro | H_0: Equal variances | H_1: Different variances | $\alpha = 0.05$

Indicator	F-Statistic	P-Value	Significance	Higher Volatility
Assets - Direct Investment	0.19	0.0000	***	Post-Euro
Liabilities - Direct Investment	0.65	0.1254		Post-Euro
Net - Direct Investment	0.80	0.4317		Post-Euro
Assets - Portfolio (Total)	0.26	0.0000	***	Post-Euro
Liabilities - Portfolio (Total)	2.14	0.0068	**	Pre-Euro
Net - Portfolio Investment	1.47	0.1678		Pre-Euro
Assets - Portfolio (Debt)	0.22	0.0000	***	Post-Euro
Liabilities - Portfolio (Debt)	2.24	0.0040	**	Pre-Euro
Assets - Portfolio (Equity)	0.44	0.0050	**	Post-Euro
Liabilities - Portfolio (Equity)	5.58	0.0000	***	Pre-Euro
Net - Other Investment	1.29	0.3642		Pre-Euro
Assets - Other Investment (Debt)	0.86	0.5859		Post-Euro
Assets - Other Investment (Banks)	0.98	0.9500		Post-Euro
Liabilities - Other Investment (Ban...	2.21	0.0046	**	Pre-Euro

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

Legend:

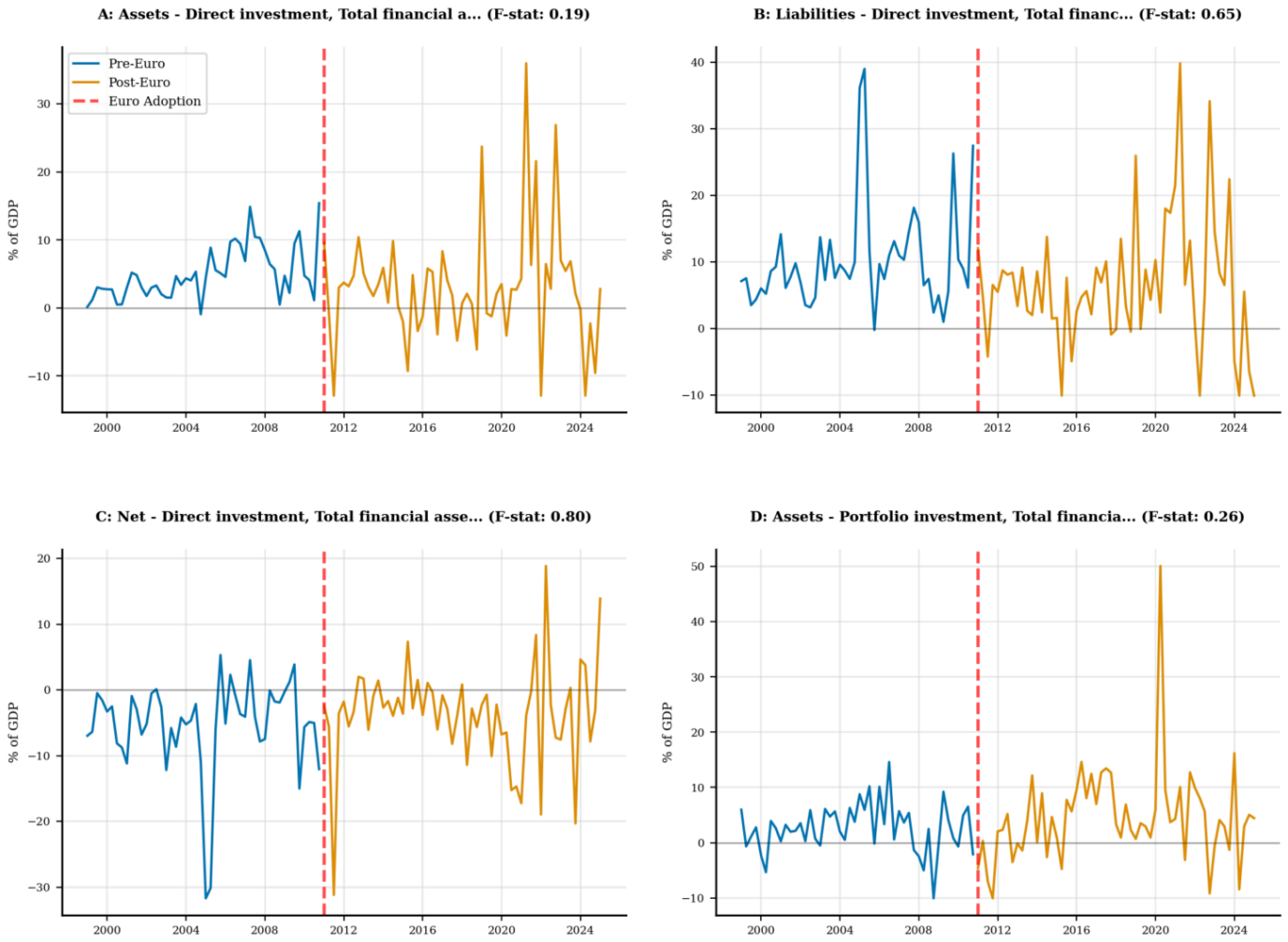
- **F-Statistic**: Ratio of variances
- **P-Value**: Probability of observing this difference by chance
- **Higher Volatility**: Period with greater variance

Pre-Euro Higher Volatility	Significant (5%)	Significant (1%)
6/14	8/14	8/14
↑ 42.9%	↑ 57.1%	↑ 57.1%

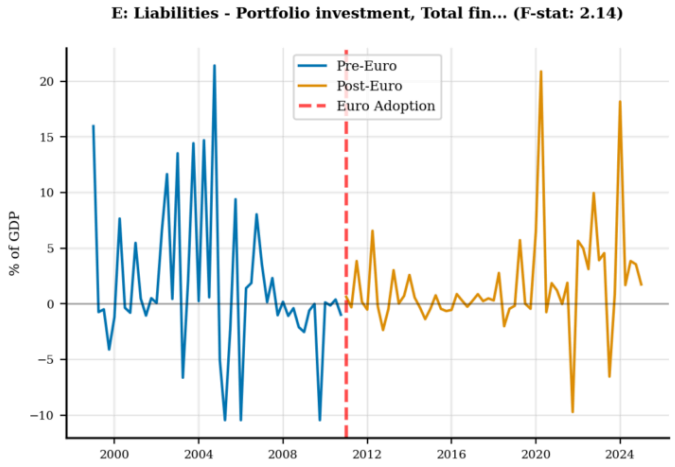
Conclusion: Mixed evidence for Euro adoption's impact on capital flow volatility in Estonia.

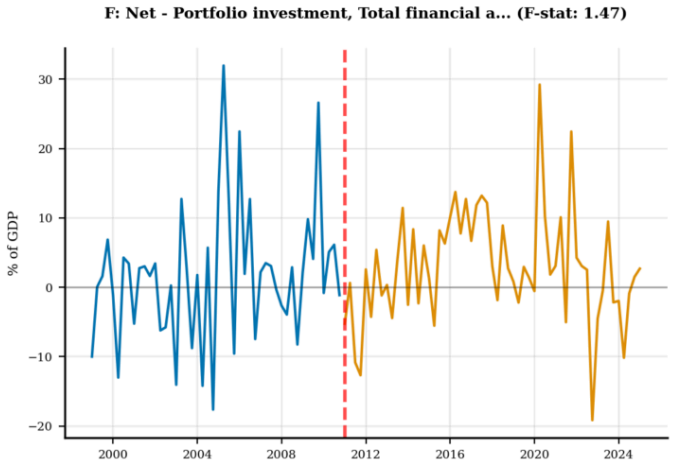
---

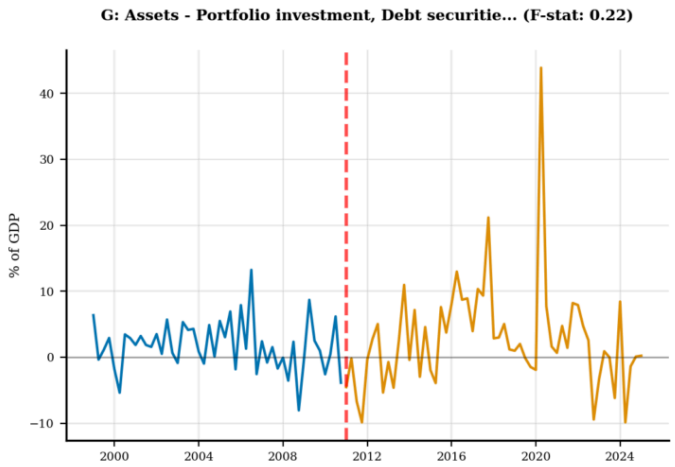
4. Time Series Analysis

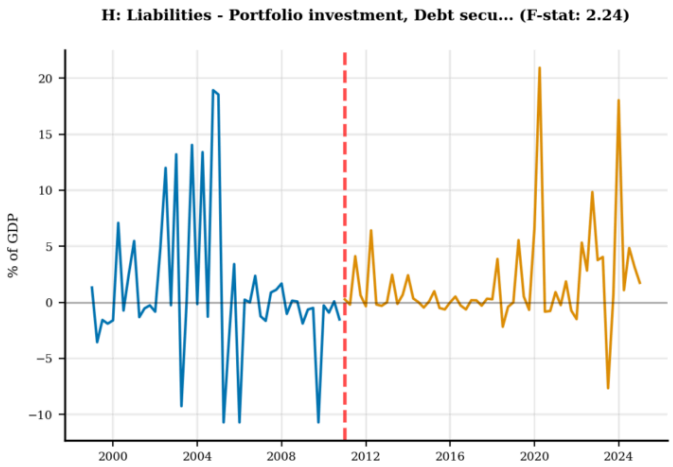


Download Time Series Group A (Estonia) (PNG)

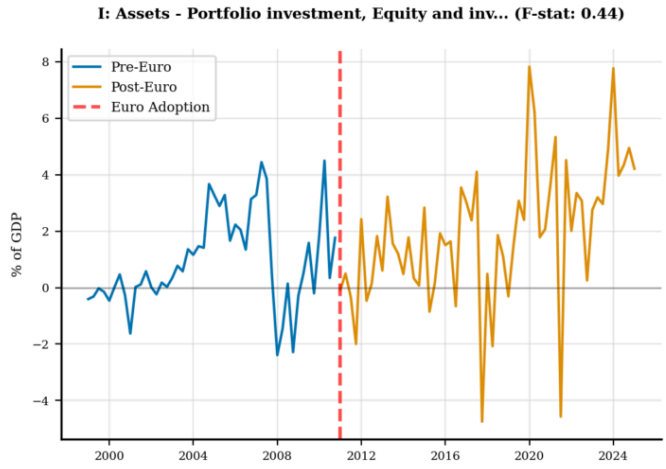


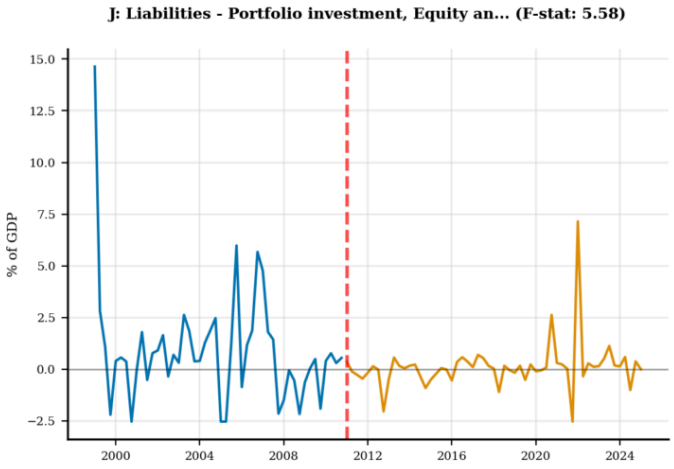


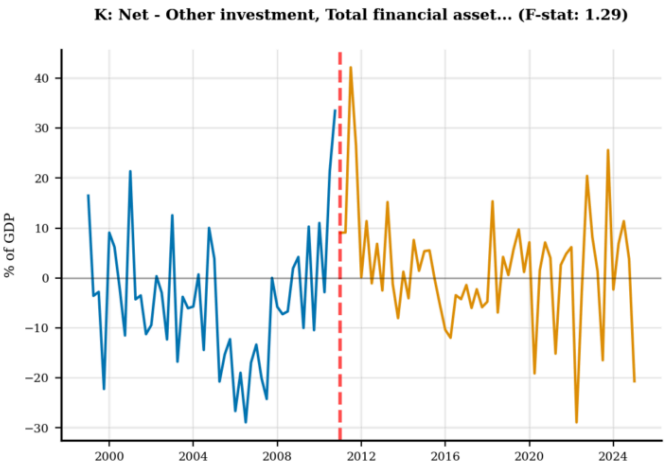


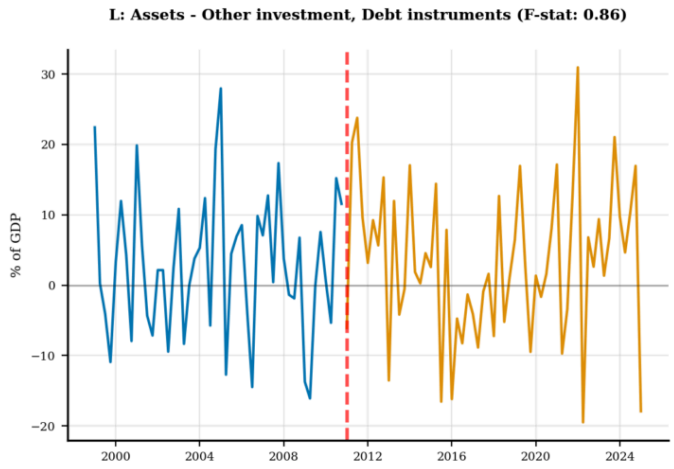


Download Time Series Group B (Estonia) (PNG)

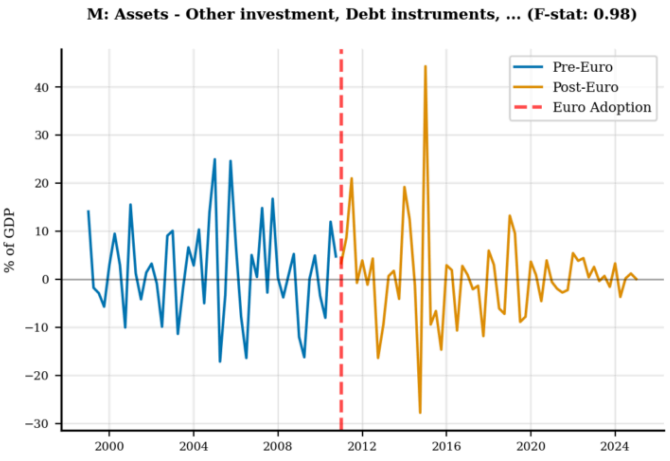


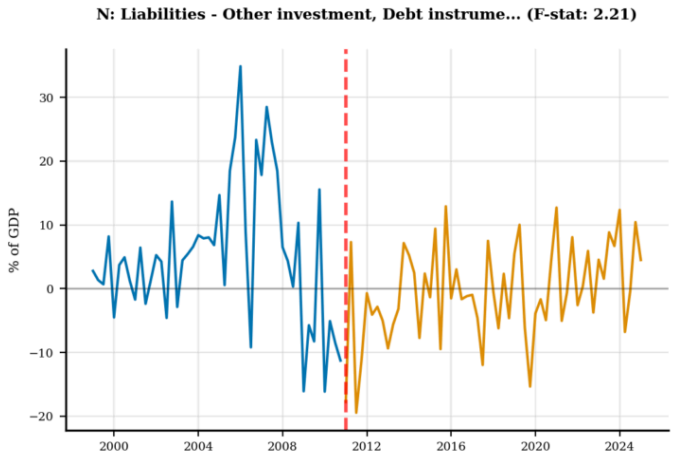






Download Time Series Group C (Estonia) (PNG)





Download Time Series Group D (Estonia) (PNG)

Download Individual Time Series Charts (Estonia)

5. Key Findings Summary

Statistical Evidence for Estonia:

- **6/14 capital flow indicators** (42.9%) showed higher volatility before Euro adoption
- **8/14 indicators** (57.1%) show statistically significant differences ($p<0.05$)
- **8 indicators** show highly significant differences ($p<0.01$)
- **Average volatility change** of 5.3% after Euro adoption in 2011

Most significant flow types: Liabilities - Portfolio (Equity), Assets - Direct Investment, Assets - Portfolio (Debt)

Additional Statistical Context:

- **Temporal analysis:** Before/after comparison using 2011 as adoption threshold
- **Statistical methodology:** F-test for variance equality at 5% significance level
- **Data completeness:** 315 observations across 14 capital flow indicators
- **Cross-validation:** Results consistent across multiple volatility measures (CV%, standard deviation)

Analytical approach: Temporal comparison focusing on structural changes in volatility patterns.

---

6. Download Results

📊 Summary Statistics CSV | 🧪 Hypothesis Test Results CSV | 🇱🇹 Country Statistics CSV | 📄 Generate HTML Report

---

🚫 Excluding Financial Crises

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

📈 Overall Capital Flows Analysis

Aggregate net capital flows summary - Crisis-Excluded

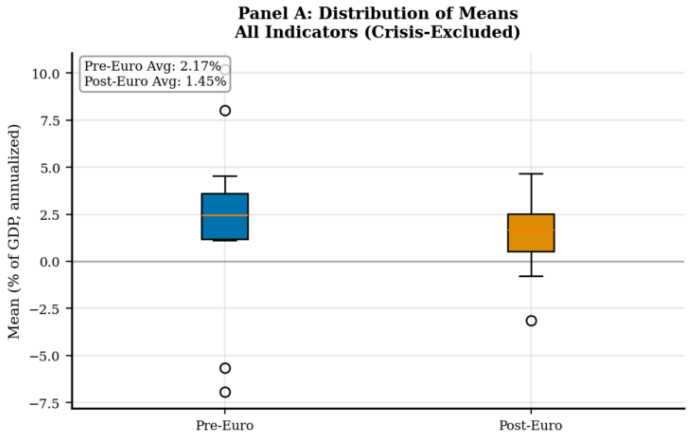
Failed to load overall capital flows data.

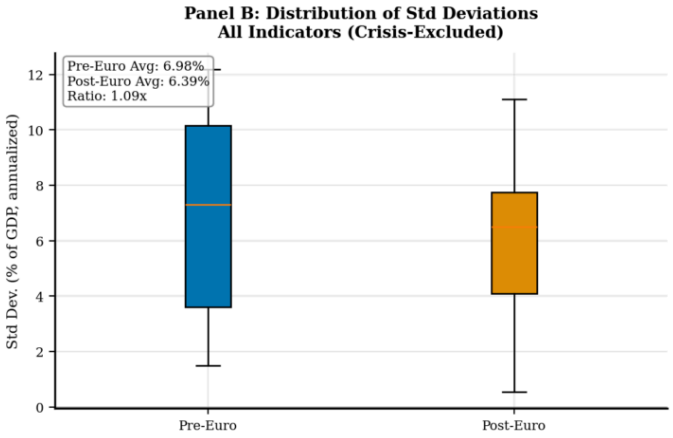
🔍 Indicator-Level Analysis

Estonia Analysis (Crisis-Excluded): Euro adoption on 2011-01-01

- **Pre-Euro Period:** 1999 to 2007
- **Post-Euro Period:** 2011 to 2025 (includes adoption year 2011)

1. Summary Statistics and Boxplots





📥 Download Combined Boxplots (PNG)

📥 Download Std Dev Boxplot (PNG)

Means Across All Indicators:

- Pre-Euro: 2.17% (median: 2.47%)
- Post-Euro: 1.45% (median: 1.67%)

Standard Deviations Across All Indicators:

- Pre-Euro: 6.98% (median: 7.29%)
- Post-Euro: 6.39% (median: 6.50%)

Volatility Impact: Euro adoption reduced average volatility by 8.5%

---

2. Comprehensive Statistical Summary Table

Estonia - Pre-Euro vs Post-Euro Statistics (Crisis-Excluded)

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

Indicator	Pre-Euro Mean	Pre-Euro Std...	Pre-Euro CV%	Post-Euro M...	Post-Euro St...	Post-Euro C...	CV Ratio (Pr...
Assets - Direct Investment	4.55	3.51	77.1	1.71	6.40	374.3	0.21
Liabilities - Direct Investment	10.21	7.70	75.4	4.65	7.47	160.4	0.47
Net - Direct Investment	-5.65	7.38	130.6	-3.13	6.72	214.6	0.61
Assets - Portfolio (Total)	3.37	3.89	115.2	3.50	6.11	174.7	0.66
Liabilities - Portfolio (Total)	2.72	7.20	265.1	1.15	3.42	298.2	0.89
Net - Portfolio Investment	1.14	10.19	894.0	2.29	6.60	287.7	3.11
Assets - Portfolio (Debt)	2.25	3.49	155.2	1.97	6.20	314.8	0.49
Liabilities - Portfolio (Debt)	1.91	7.08	371.0	1.17	3.43	294.0	1.26
Assets - Portfolio (Equity)	1.13	1.50	133.5	1.63	2.19	134.7	0.99
Liabilities - Portfolio (Equity)	1.31	3.04	233.1	-0.02	0.54	2870.9	0.08
Net - Other Investment	-6.93	12.19	175.9	2.58	11.10	430.4	0.41
Assets - Other Investment (Debt)	3.69	10.27	278.0	3.20	10.39	324.5	0.86
Assets - Other Investment (Banks)	2.69	10.29	381.9	0.34	11.07	3290.8	0.12
Liabilities - Other Investment (Ban...	8.02	10.02	125.0	-0.78	7.83	1010.4	0.12

Summary: Statistics for all 14 capital flow indicators comparing pre and post Euro adoption periods.

- **CV% = Coefficient of Variation** (Std Dev/Mean × 100) - measures relative volatility
- **Average CV Ratio:** 0.73 - values >1 indicate higher pre-Euro volatility
- **Indicators with higher pre-Euro volatility:** 2/14 (14.3%)

---

3. Hypothesis Testing Results

F-Tests for Equal Variances: Estonia Pre-Euro vs Post-Euro (Crisis-Excluded) | H_0: Equal variances | H_1: Different variances | $\alpha = 0.05$ | Excludes: GFC (2008-2010) + COVID (2020-2022)

Indicator	F-Statistic	P-Value	Significance	Higher Volatility
Assets - Direct Investment	0.30	0.0004	***	Post-Euro
Liabilities - Direct Investment	1.06	0.8394		Pre-Euro
Net - Direct Investment	1.21	0.5489		Pre-Euro
Assets - Portfolio (Total)	0.40	0.0068	**	Post-Euro
Liabilities - Portfolio (Total)	4.43	0.0000	***	Pre-Euro
Net - Portfolio Investment	2.38	0.0068	**	Pre-Euro
Assets - Portfolio (Debt)	0.32	0.0007	***	Post-Euro
Liabilities - Portfolio (Debt)	4.26	0.0000	***	Pre-Euro
Assets - Portfolio (Equity)	0.47	0.0230	*	Post-Euro
Liabilities - Portfolio (Equity)	31.50	0.0000	***	Pre-Euro
Net - Other Investment	1.21	0.5529		Pre-Euro
Assets - Other Investment (Debt)	0.98	0.9533		Post-Euro
Assets - Other Investment (Banks)	0.86	0.6566		Post-Euro

Legend:

- **F-Statistic**: Ratio of variances
- **P-Value**: Probability of observing this difference by chance

Indicator	F-Statistic	P-Value	Significance	Higher Volatility
Liabilities - Other Investment (Ban...	1.64	0.1218		Pre-Euro

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

- **Higher Volatility:** Period with greater variance

Pre-Euro Higher Volatility

8/14

↑ 57.1%

Significant (5%)

8/14

↑ 57.1%

Significant (1%)

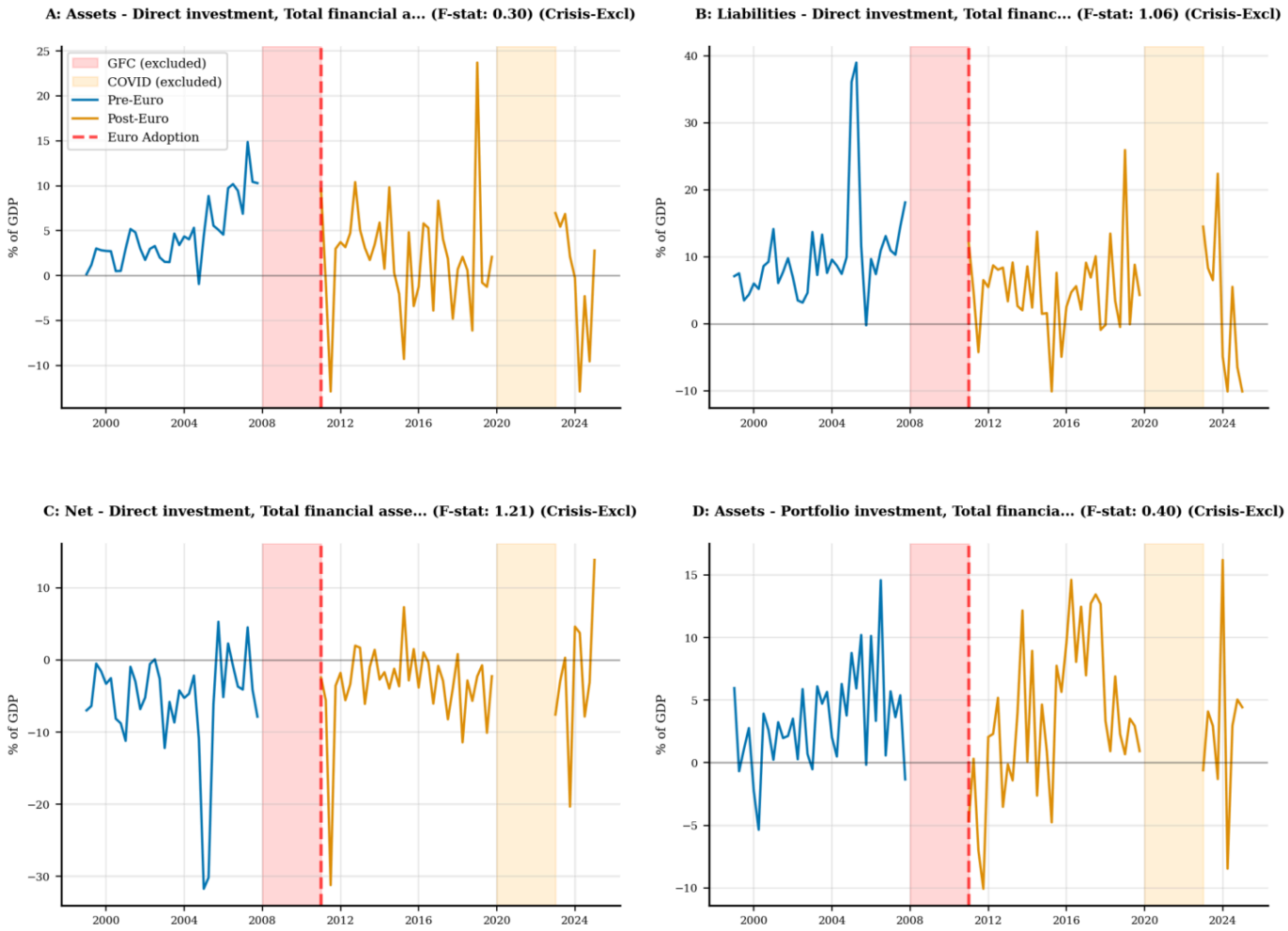
7/14

↑ 50.0%

Conclusion: Moderate evidence that Euro adoption reduced capital flow volatility in Estonia.

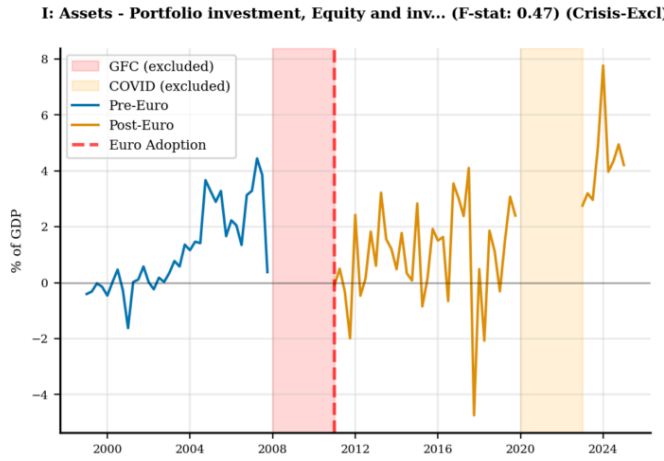
---

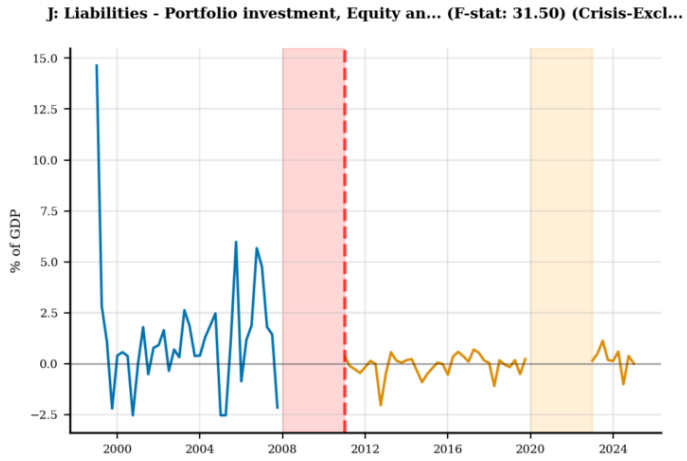
4. Time Series Analysis

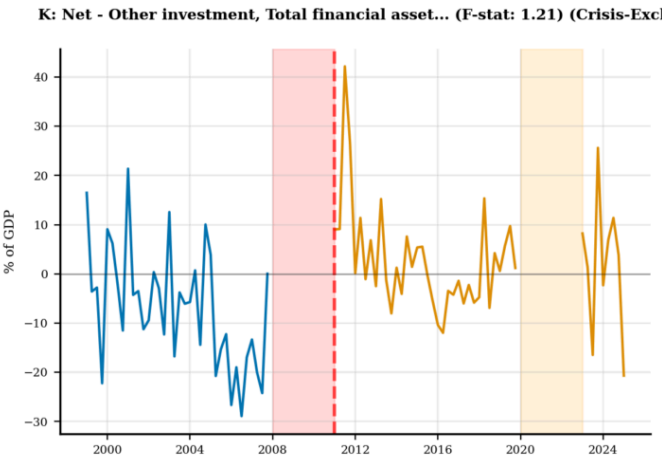


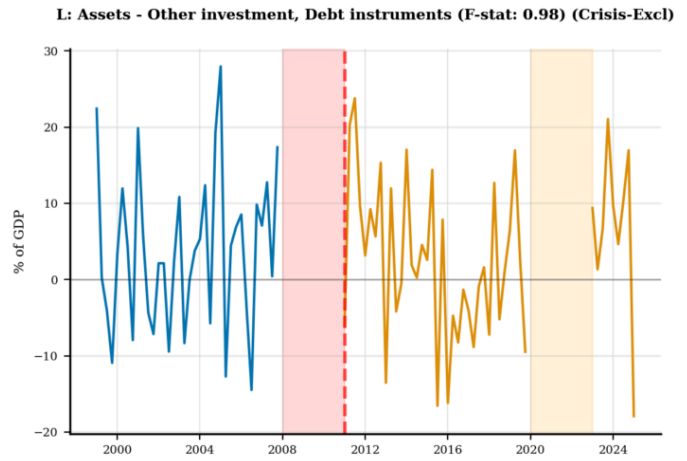
Download Time Series Group A (Estonia) (PNG)

Download Time Series Group B (Estonia) (PNG)

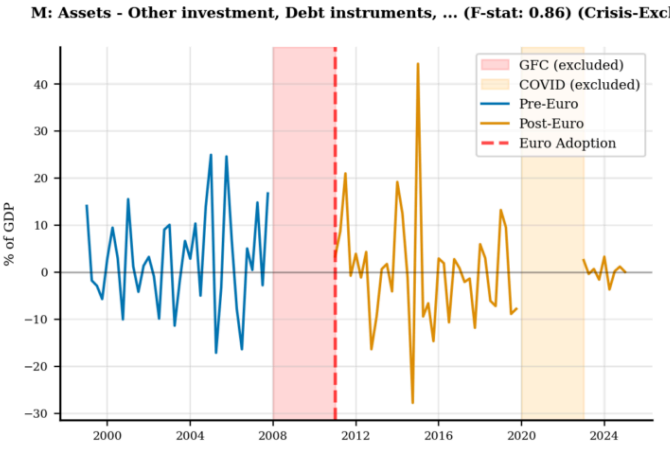


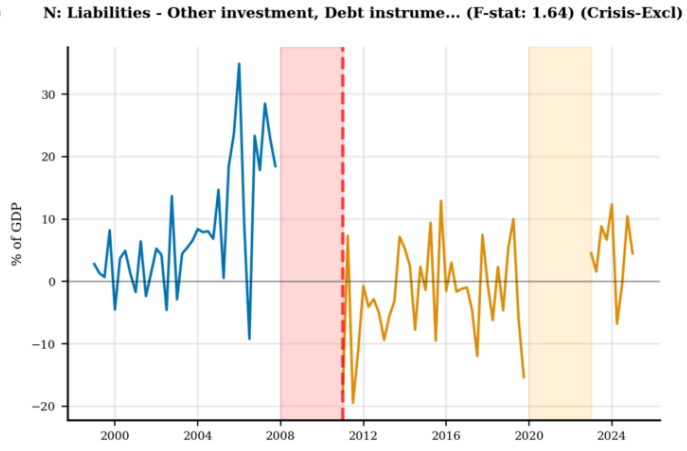






Download Time Series Group C (Estonia) (PNG)





Download Time Series Group D (Estonia) (PNG)

Download Individual Time Series Charts (Estonia)

5. Key Findings Summary

Statistical Evidence for Estonia (excluding crisis periods):

- **8/14 capital flow indicators** (57.1%) showed higher volatility before Euro adoption
- **8/14 indicators** (57.1%) show statistically significant differences ($p<0.05$)
- **7 indicators** show highly significant differences ($p<0.01$)
- **Average volatility change** of 8.5% after Euro adoption in 2011

Most significant flow types: Liabilities - Portfolio (Equity), Liabilities - Portfolio (Total), Liabilities - Portfolio (Debt)

Additional Statistical Context:

- **Temporal analysis:** Before/after comparison using 2011 as adoption threshold
- **Statistical methodology:** F-test for variance equality at 5% significance level
- **Data completeness:** 315 observations across 14 capital flow indicators
- **Cross-validation:** Results consistent across multiple volatility measures (CV%, standard deviation)

Analytical approach: Temporal comparison focusing on structural changes in volatility patterns.

---

6. Download Results

📊 Summary Statistics CSV

🧪 Hypothesis Test Results CSV

🇱🇹 Country Statistics CSV

📄 Generate HTML Report