Chapter 2

Impact of the Inflation Announcements on the Stock Returns: Evidence from Finnish and Polish Banking Sectors

Ahmet Yakup Erkılıç[1]

Rana Torun[2]

Abstract

Previous studies have extensively documented effects of macroeconomic news on the stock prices. However, the specific impact of inflation rate announcements — measured by the Consumer Price Index (CPI) — has received limited attention in financial literature, particularly in the context of the developing economies. This study aims to assess and compare semi-strong form efficiency of stock markets (banking sectors) in Finland and Poland in reaction to inflation announcements from 2015 to 2024, within the Efficient Market Hypothesis (EMH) framework. The results indicate that both the Finnish and Polish banking sectors exhibit semi-strong form efficiency in response to the monthly public release of inflation data, suggesting that it is impossible to earn abnormal returns based on these announcements.

1. Introduction

Inflation is defined as a sustained rise in general price level of goods and services within an economy, commonly measured by indices such as CPI or Retail Price Index (RPI). In the first half of the past decade, monthly inflation rates in Finland fluctuated between -0.6% and 1.5%, and they reached their peak in December 2022 with 9.1% and decreased to 1% at the end of the past decade. In Poland, monthly inflation rates followed almost the same pattern as the rates in Finland as altering around -1.1% and 4.7% in the first half of the past decade, reaching to their maximum in February 2023 with

1 Dr., Ministry of Culture and Tourism of the Republic of Türkiye, ayerkilic@gmail.com, 0000-0002-1980-8136.

2 Dr., Abdullah Gül University, rana.torun@agu.edu.tr, 0000-0002-4776-4011.

https://doi.org/10.58830/ozgur.pub1111.c4734

18.4%, diminshing to 2% in March 2024 and closing the past decade with 4.7%. Over time, many researchers have explored how inflation and other macroeconomic factors impact financial markets. While the empirical link between news and returns is being questioned, the process by which news is incorporated into security prices is poorly understood. Research to date presents a lack of consensus. Some, including Goodhart and Smith (1985) and Amihud (1996), identified a negative link between inflation and stock market performance. In contrast, other studies, like those by Joyce & Read (2002), reported minimal or no meaningful connection between the two.

This research analyzes relationship between inflation announcements and stock returns to explore a research question. Do Consumer Price Index (CPI) announcements influence stock returns?

The motivation for this study is twofold. First, there is an ongoing debate regarding the nature of this relationship. Thus, exploring it using a different methodology, namely, event study, may yield fresh insights. Second, the existing body of research on Finland and Poland is relatively limited. Thus, exploring the relationship in Finland and Poland may lead to empirical contributions to the literature.

The remainder of this study is structured as follows. Section 2 offers a concise theoretical overview of the topic. Section 3 describes data and methodology and investigates whether stock prices react to inflation-related news. Section 4 presents results and discussion. Finally, Section 5 concludes analysis.

2. Literature

One of the pioneering studies exploring relationship between macroeconomic indicators and stock prices was conducted by Schwert (1981), which examines how stock prices respond to newly released inflation data by analyzing the daily returns of Standard & Poor's composite portfolio from 1953 to 1978. It is found that stock market appears to respond negatively to the unexpected inflation announcements.

Goodhart and Smith (1985) analyze Retail Price Index (RPI) announcement data covering the period from January 1977 to December 1983 on UK stock market. Findings reveal that unexpected inflation significantly negatively impacts UK stock market.

McQueen & Roley (1993) investigate whether stock price responses to macroeconomic news differ across various phases of the business cycle in the U.S. setting by using the Standard & Poor's 500 Index. Market participants'

reactions to unexpected economic announcements are found to vary across different stages of business cycle.

Amihud (1996) explores the relationship between unanticipated inflation and equity prices in the Israeli setting. The results demonstrate that unexpected inflation exerts a statistically significant negative effect on stock returns.

Joyce & Read (2002) investigate the immediate response of various UK asset prices to the monthly RPI announcements, covering sample period from early 1980s through April 1997. The findings suggest that the markets exhibit efficiency, as asset prices remain unresponsive to expected component of RPI announcements.

Adams et al. (2004) examine impact of unexpected inflation announcements (unforeseen changes in price indexes) on stock returns. In other words, whether information in Producer Price Index (PPI) and CPI announcements influences the stock returns is reviewed. Findings reveal a strong connection between the PPI and CPI inflation news and the stock returns. Moreover, this relationship is most substantial for portfolios of large stocks.

Knif et al. (2008) explore the impact of the good and bad inflation news on the stock returns in the U.S. setting. Findings indicate that stock market responses to the positive and negative inflation shocks vary according to prevailing economic conditions. The results suggest that impact of inflation on the stock returns is contingent upon investors' perceptions of inflationary shocks as either favorable or unfavorable, depending on the economic context.

Li et al. (2010) examine impact of expected and unexpected inflation announcements on UK stock markets. The unexpected inflation rate exerts a statistically significant and negative effect, while expected inflation rate has a little impact on the stock returns.

Díaz & Jareño (2013) examine how the Spanish stock market reacts to inflation news using consumer price index data. It is observed that unexpected inflation news leads to statistically significant abnormal returns across all industries on the announcement day. Moreover, it is found that investors tend to react more strongly to negative news than to positive news.

Belen & Gümrah (2016) examine the impact of surprises in the inflation announcements (difference between expectations and actual figures) on the stock market in the Turkish context. Covering the period from January 2006 to February 2016 and using the event study, it was found that while there were abnormal returns, they did not follow a systematic pattern, and no significant effect was observed on the event day.

Sathyanarayana & Gargesa (2018) seek to analyze relationship between inflation and stock market returns by focusing on major stock indices within the selected countries. The results revealed that most of the selected indices showed a negative correlation with inflation. Specifically, countries such as India, Austria, Belgium, Canada, Chile, China, France, and Ireland exhibited a negative coefficient. Conversely, positive correlations were observed for Brazil, Indonesia, Japan, Mexico, Spain, and Türkiye.

Singh & Padmakumari (2020) evaluate the efficiency - or semi-strong form efficiency - of Indian stock market regarding inflation announcements by employing the event study. It is found that Indian stock market does not exhibit short-run efficiency in response to inflation announcements, as a significant number of events are associated with abnormal returns. However, specific industries display greater sensitivity to inflation news.

Thorbecke (2025) examines the effects of post-2019 inflation fluctuations on the U.S. stock market. The evidence suggests that investors largely failed to incorporate inflation expectations into asset prices until inflation rose significantly.

3. Research Methodology

The primary aim of this study is to analyze and compare semi-strong form market efficiency of Finnish and Polish banking sectors in response to the inflation announcements throughout 2015-2024.

The analysis is based on EMH and utilizes an event study methodology, focusing on monthly inflation rates as key macroeconomic indicators relevant to the Finnish and Polish stock markets. Under this hypothesis, market efficiency exists if prices at any given moment completely incorporate all information available to market participants (Fama, 1970). Within the framework of EMH, these inflation figures are treated as new information entering the market. The specific dates when this data is publicly released are identified as event dates, and both the event window and estimation window are defined based on these announcement dates.

The study applies the market model for forecasting purposes, using the OMX Helsinki 25 and WIG stock indices to reflect the overall market performance in Finland and Poland, respectively. To represent banking sectors in each country, Helsinki Banks index is used for Finland, and WIG Banks index for Poland. The logic behind the selection of these two countries is that they are both members of the European Union, and the inflation rates are among the most important indicators for the banking sectors in these countries.

In line with the study's objective, the effects of monthly publicly announced inflation rates on the banking stock indices of Finland and Poland are analyzed. Over the 10 years, 120 inflation data points for each country are planned and actually used. However, due to the unavailability of data for the Finnish banking index between July 13, 2020, and August 14, 2020, the analysis for Finland is conducted using 117 data points. In contrast, the complete set of 120 data points is available and used for Poland as initially planned.

The event window is selected to cover five working days before and after event date (t-5, t+5) to better isolate impact of inflation rate announcements on the banking sector and minimize the potential influence of other events. The estimation window starts one month before the event date and ends at the beginning of the event window as (t-20, t-6).

4. Results and Discussion

The study's calculations are carried out simultaneously for Finnish and Polish stock markets. Under the EMH, daily returns of the main stock indices and banking sector indices for both Finland and Poland are calculated as a first step as follows:

$$\left(R_m\right)_t = \ln\left[\frac{\left(T_m\right)_t}{\left(T_m\right)_{t-1}}\right]$$

Where:

$\left(R_m\right)_t$, is return of main stock index on the day (t),

$\left(T_m\right)_t$, is closing value of main stock index on the day (t),

$\left(T_m\right)_{t-1}$, is closing value of main stock index on the day (t-1),

ln, denotes natural logarithm.

$$\left(R_i\right)_t = \ln\left[\frac{\left(T_i\right)_t}{\left(T_i\right)_{t-1}}\right]$$

where:

$\left(R_i\right)_t$, is return of banking sector index on day (t),

$\left(T_i\right)_t$, is closing value of banking sector index on day (t),

$\left(T_i\right)_{t-1}$, is closing value of banking sector index on day (t-1),

ln, denotes natural logarithm.

Following this, regression analysis is conducted during the estimation window to determine expected returns of banking sector indexes based on the return of main stock indexes with below-mentioned market model:

$(E(R_i))_t = (\alpha_i)_t + (\beta_i)_t * (R_m)_t + (e_i)_t$

Where:

$(E(R_i))_t$, is expected return of banking sector index on the day (t);

$(\alpha_i)_t$, is intercept of regression analysis on day (t);

$(\beta_i)_t$, is a coefficient showing relationship between returns of banking sector index and main stock index on day (t);

$(R_m)_t$, is return of main stock index on day (t) and

$(e_i)_t$ is error term.

Then, abnormal returns (AR) are calculated for event window period as follows:

$((AR)_i)_t = (R_i)_t - (E(R_i))_t$

Where:

$((AR)_i)_t$, is the abnormal return for banking sector index on day (t),

$(R_i)_t$, is the actual return of banking sector index on day (t),

$(E(R_i))_t$, is the expected return of banking sector index on day (t).

After finding daily ARs, cumulative abnormal return (CAR) is calculated with adding all ARs for whole event window. The results are presented in Appendix 1.

For analyzing and comparing semi-strong form market efficiency of the Finnish and Polish banking sectors in response to inflation announcements, the following statistical calculations are made for both countries. The results are given in the Table 1.

Table 1. CAR Statistics for Finnish and Polish banking sector indexes

Statistics (CAR)	**For Finnish banking sector index**	**For Polish banking sector index**
Total	0,19345296	0,261167595
Average	0,001653444	0,002176397
Standard Deviation	0,054556201	0,041213742

Based on these statistics, calculated t and p values for both countries are presented in Table 2.

Table 2. t and p values for Finnish and Polish banking sector indexes

Values	For Finnish banking sector index	For Polish banking sector index
t-value	0,327822174	0,578477692
p-value	0,743654	0,564087

These p-values can be interpreted to be statistically insignificant, indicating that both Finnish and Polish banking sectors demonstrate semi-strong form market efficiency in response to monthly public announcements of inflation rate data.

5. Conclusion

This study provides valuable insights into how monthly inflation announcements affect the Finnish and Polish stock markets, focusing on the banking sector. In this context, an analysis and comparison of semi-strong market efficiency in Finnish and Polish banking sectors is conducted, focusing on their responses to inflation announcements from 2015 to 2024.

The analysis utilizes an event study methodology, focusing on monthly inflation rates as key macroeconomic indicators relevant to the Finnish and Polish stock markets. Within the framework of EMH, these inflation figures are treated as new information entering the market. The specific dates when this data is publicly released are identified as event dates, and both the event window and estimation window are defined based on these announcement dates.

The study applies the market model for forecasting purposes, using the OMX Helsinki 25 and WIG stock indices to reflect the overall market performance in Finland and Poland, respectively. To represent the banking sectors in each country, the Helsinki Banks index is used for Finland, and the WIG Banks index for Poland.

In line with the study's objective, the effects of monthly publicly announced inflation rates on the banking stock indices of Finland and Poland are analyzed. Over the 10 years, 120 inflation data points for each country are planned to be used. However, due to the unavailability of data for the Finnish banking index between July 13, 2020, and August 14, 2020, the analysis for Finland

is conducted using 117 data points. In contrast, the complete set of 120 data points is available and used for Poland as initially planned.

The market model is employed as the forecasting framework in the analysis. Findings indicate that Finnish and Polish banking sectors demonstrate semi-strong form market efficiency in response to monthly public announcements of inflation rate data.

The results align generally with studies like Joyce & Read (2002) and Castanias (1979). However, the findings contradict the study by Adams et al. (2004) and Díaz & Jareño (2013), which determined that abnormal returns could be achieved through publicly announced macroeconomic disclosures and that the market does not have semi-strong efficiency.

This study provides remarkable strategic insights for investors. Given that both the Finnish and Polish banking sectors demonstrate semi-strong form market efficiency in response to publicly disclosed monthly inflation data, these markets seem suitable for implementing long-term trading strategies. Furthermore, the presence of semi-strong form market efficiency may enhance the confidence of both domestic and international investors in the Finnish and Polish banking sectors.

It is recommended that the methodology employed in this study - namely, the event study approach within the framework of EMH applied to the banking sector - be extended to other inflation-sensitive sectors, such as the energy sector, to facilitate comparative sector-based analysis. Furthermore, future research could explore the impact of additional macroeconomic indicators, including employment figures, exchange rates, interest rates, and money supply, to further examine market reactions within the Finnish and Polish stock markets.

In conducting event studies, it is essential to acknowledge potential presence of other events within estimation and event windows that may influence stock markets and the banking sector globally and, on a country-specific or sectoral level. Confounding effects can occur in the analysis. Changing the estimation and event windows and replicating the analysis across alternative periods can help mitigate such effects. These additional studies would facilitate meaningful comparisons and contribute to a more robust assessment of market efficiency in the Finnish and Polish banking sectors.

6. References

Adams, G., McQueen, G., & Wood, R. (2004). The Effects of Inflation News on High Frequency Stock Returns. *Journal of Business,, 77*(3), 547-574.

Amihud, Y. (1996). Unexpected Inflation and Stock Returns Revisited--Evidence from Israel. *Journal of Money, Credit and Banking, 28*(1).

Belen, M., & Gümrah, Ü. (2016). Belen, M., & Gümrah, Ü. (2016). Türkiye'de hisse senedi piyasasının enflasyon açıklamalarındaki sürprizlere tepkisi. *İnsan ve Toplum Bilimleri Araştırmaları Dergisi, 5*(3), 428-441.

Castanias, R. P. (1979). Macroinformation and the Variability of Stock Market Prices. *The Journal of Finance, 34*(2), 439-450.

Díaz, A., & Jareño , F. (2013). Inflation news and stock returns: market direction and flow-through ability. *Empirical Economics, 44*, 775-798.

Fama, E. F. (1970). Efficient Capital Markets A Review of Theory and Empirical Work. *Journal of Finance, 25*(2), 383-417.

Goodhart, C. A., & Smith, R. G. (1985). The Impact of News on Financial Markets in the United Kingdom: Note. *Journal of Money, Credit and Banking, 17*(4), 507-511.

Joyce, M. A., & Read, V. (2002). Asset price reactions to RPI announcements. *Applied Financial Economics, 12*(4), 253-270.

Knif, J., Kolari, J., & Pynnönen, S. (2008). Stock market reaction to good and bad inflation news. *Journal of Financial Research, 31*(2), 141-166.

Li, L., Narayan, P. K., & Zheng, X. (2010). An analysis of inflation and stock returns for the UK. *Journal of International Financial Markets, Institutions & Money, 20*(5), 519-532.

McQueen, G., & Roley, V. V. (1993). Stock Prices, News, and Business Conditions. *The Review of Financial Studies, 6*(3), 683-707.

Sathyanarayana, S., & Gargesa, S. (2018). An Analytical Study of the Effect of Inflation on Stock Market Returns. *IRA-International Journal of Management & Social Sciences, 13*(2), 48-64.

Schwert, G. W. (1981). The Adjustment of Stock Prices to Information About Inflation. *36*(1), 15-29.

Singh, G., & Padmakumari, L. (2020). Stock market reaction to inflation announcement in the Indian stock market: A sectoral analysis. *Cogent Economics & Finance, 8*(1), 1723827.

Thorbecke, W. (2025). The Impact of Inflation on the U.S. Stock Market After the COVID-19 Pandemic. *International Journal of Financial Studies, 13*(1), 9.

Appendix 1. Results for Finnish and Polish banking sector indexes

Year	Month	CAR (Finnish)	CAR (Polish)
2015	1	0,018655758	-0,011571463
2015	2	-0,050094924	-0,013872432
2015	3	-0,088362126	0,017891765
2015	4	0,045840505	0,045870245
2015	5	0,026269599	-0,032974976
2015	6	-0,012551095	0,017943338
2015	7	0,006138631	-0,031527319
2015	8	0,000568472	0,024128819
2015	9	-0,032274503	-0,042836946
2015	10	-0,053213612	-0,002815486
2015	11	0,04449866	0,001856676
2015	12	0,02134582	0,021569456
2016	1	-0,028802389	-0,034078591
2016	2	-0,00803107	0,016777397
2016	3	-0,066717186	-0,015522256
2016	4	0,123445917	-0,013992332
2016	5	0,031141176	0,025498164
2016	6	0,008013166	-0,009618956
2016	7	0,109666391	-0,028727443
2016	8	-0,008836761	-0,009554327
2016	9	-0,063207768	-0,020630265
2016	10	-0,00229556	-0,012713068
2016	11	0,004078092	-0,002821269
2016	12	0,035762512	0,065343799
2017	1	0,001647457	-0,027633878
2017	2	-0,066907426	-0,014860622
2017	3	-0,022702679	0,001966959
2017	4	0,037456746	-0,005673077
2017	5	-0,053568418	0,01616349
2017	6	0,005123815	-0,011483488
2017	7	-0,055296794	-0,011090971
2017	8	0,030489185	-0,006359391
2017	9	-0,011845633	0,020735558
2017	10	-0,03247054	0,029961251
2017	11	0,056141565	0,054574112
2017	12	0,033974747	-0,032401873
2018	1	-0,024037097	-0,030632269
2018	2	-0,028961883	-0,005609192
2018	3	-0,032849824	-0,014015127
2018	4	0,045850365	0,000398846
2018	5	0,010208677	0,016003519

2018	6	0,06204336	0,022519116
2018	7	-0,000493833	-0,01986082
2018	8	-0,046431448	-0,010139538
2018	9	-0,012249257	-0,007676162
2018	10	-0,013539001	0,012993188
2018	11	0,07412113	-0,028385639
2018	12	-0,030335554	0,039747911
2019	1	-0,018609219	-0,035841031
2019	2	-0,019001471	0,016788242
2019	3	0,060194066	0,008658967
2019	4	0,100674046	0,011894922
2019	5	-0,078635433	-0,031906727
2019	6	-0,005839733	-0,021430857
2019	7	-0,12253497	0,025626539
2019	8	0,042751981	0,040237289
2019	9	0,009918709	-0,00067527
2019	10	0,05238399	0,030030856
2019	11	-0,043553895	-0,055591354
2019	12	0,10942571	0,041274665
2020	1	-0,067211052	-0,014676441
2020	2	0,002194735	-0,034554621
2020	3	-0,107846197	-0,129052166
2020	4	0,03913181	0,027492893
2020	5	-0,069417585	0,043882282
2020	6	-0,027052401	0,026194019
2020	7	N/A	-0,011717798
2020	8	N/A	0,086272193
2020	9	N/A	0,034467878
2020	10	-0,051026193	-0,082192813
2020	11	-0,071072949	0,137813354
2020	12	-0,061537755	0,051147836
2021	1	0,079772866	0,024812509
2021	2	0,062641788	0,06757289
2021	3	-0,086493067	-0,092737775
2021	4	-0,041410761	0,013377303
2021	5	0,047497348	-0,001453479
2021	6	0,017396175	0,001590326
2021	7	0,014636175	0,069754074
2021	8	-0,01884457	0,012153277
2021	9	0,11086223	-0,022445606
2021	10	-0,030764561	-0,05480598
2021	11	0,0022841	-0,0277429
2021	12	-0,019288461	-0,047383538
2022	1	-0,057812405	0,046079973
2022	2	-0,019518497	-0,080492596

2022	3	0,097051267	0,089830901
2022	4	0,05102034	-0,002555718
2022	5	-0,023635984	-0,008642186
2022	6	0,013993785	0,054438249
2022	7	0,112040933	0,025681007
2022	8	-0,087166496	0,046546305
2022	9	0,03559784	-0,016323215
2022	10	0,107762174	0,14869163
2022	11	-0,058891916	-0,01992399
2022	12	-0,002629996	0,033103615
2023	1	-0,025044712	-0,040099001
2023	2	0,054637331	0,03103605
2023	3	-0,084639222	0,005375385
2023	4	0,157054116	0,011067148
2023	5	0,03884892	0,020912438
2023	6	0,05712562	-0,023350391
2023	7	0,006908186	-0,042936463
2023	8	-0,017593925	-0,029549971
2023	9	0,036194114	-0,033766122
2023	10	-0,008205815	-0,018482131
2023	11	0,050352661	0,043172886
2023	12	0,001970236	-0,023277088
2024	1	-0,043312863	0,013228295
2024	2	0,070508675	0,027204617
2024	3	-0,057245992	0,02667104
2024	4	0,072000976	-0,046243023
2024	5	-0,017563915	-0,084155089
2024	6	-0,009090812	0,008700157
2024	7	-0,013113021	-0,003261263
2024	8	-0,018480328	0,025822113
2024	9	-0,008515132	-0,034013168
2024	10	0,081584962	0,068129576
2024	11	-0,041257466	-0,052725661
2024	12	-0,055511501	0,045574894