Financial Conditions, Uncertainty and Expectations Errors

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Abstract

Using a novel and comprehensive database of Turkish firms that combines the Business Tendency Survey (BTS) with the Company Accounts, we analyze the determinants of expectation errors of Turkish manufacturing firms. We examine firm expectation errors for various variables, including those related to sales, exports, consumer and producer prices inflation rates. We investigate the impact of various firm characteristics and macroeconomic factors reflecting uncertainty (exchange rate volatility and VIX index) and monetary policy stance on firms' absolute expectation errors. Using fixed effects panel technique, we estimate that macro variables that control for uncertainty or volatility explain expectation errors better than firm-level variables. The rise in the exchange rate volatility and VIX Index is estimated to be associated with the worsening of the accuracy of expectations. The accuracy of expectations of sales improves with firm size while the accuracy of expectations errors for inflation rates declines with the share of short-term liabilities and liquidly ratio.

1 Introduction

Expectations play a key role in macroeconomics. Key references go back to seminal contributions by Lucas (1972). Despite the importance of expectations in macroeconomics, it is only recently that there has been steady interest in the expectations of firms. Bernanke (2007) discussed inflation expectations and the lack of reliable data on expectations at the firm level, despite the existence of several sources of inflation expectations, including surveys for households and professional forecasts.

The rational expectations theory posits that economic agents, including firms, form expectations that are unbiased and based on all available information. According to this theory, firms should make accurate forecasts about economic variables such as inflation, sales, exports, production, investment. In contrast, models considering informational asymmetries suggest that firms have access to information with varying degrees, leading to expectation errors.

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This study investigates the roles of firm specific characteristics and uncertainty in the formation of firms' expectations in Türkiye, an emerging economy characterized by significant economic volatility. This context provides a unique opportunity to test the predictions of these theories under conditions of high uncertainty. The importance of expectations at the firm level is underlined by the current wave of research on this topic, including the handbook of recent research by Bachmann and Elstner (2015). Despite recent research, the issue of expectation formation is not yet settled. Recent studies indicate that firms' expectations tend to be driven mostly by firm-level news, as seen in Born et al. (2022) and Born et al. (2023). Firm-specific developments are, in fact, as important as developments in the aggregate economy and firms' industry (Freuding et al., 2021). However, up to now, the research is still limited.

This paper aims to address the following research question: What is the role of firm specific characteristics and macro level uncertainty in the formation of firms' expectations? In addressing this question, the paper offers several contributions. First, it extends the existing body of research by focusing on firm specific variables such as liquidity ratio, leverage ratio,the share of short-term liabilities, size and export intensity. Additionally, it examines macroeconomic factors that have received less attention, such as uncertainty or volatility. Second, it tests the determinants of a broader range of variables, including expectation errors related to sales, exports and CPI and PPI inflation rates. Lastly, it utilizes a merged database on Turkish enterprises, including both expectations and firm-level indicators, that has not been extensively studied, thereby providing new evidence from an emerging economy.

2 Literature Review

Expectations are crucial in economic modeling and policy design, directly influencing production, pricing and investment decisions of economic agents (Ma et al., 2020; Enders et al., 2022). Understanding the formation of expectations is vital due to firms' significant role in the macroeconomy. Failure to accurately anticipate expectations can lead to bad policy choices potential welfare losses and factor misallocations (Bachmann and Elstner, 2015).

2.1 Theoretical Perspectives

According to Lucas's rational expectations theory, firms' expectations are generally accurate and unbiased, incorporating all relevant information (Lucas, 1972). Full-information rational expectation theory remains a key building block in many macroeconomic theories, particularly in understanding business cycles. However, empirical evidence starkly contrasts with this theoretical framework, suggesting that expectations on prices, production, and other indicators differ considerably across firms (Born et al., 2023; Candia et al., 2023; Bachmann and Elstner, 2015).

The literature offers different perspectives on why firms' expectations may diverge. Island models, inspired by Lucas's work, suggest that disagreement among firms arises from observing different local and aggregate economic signals. Andrade et al. (2022) further explores this heterogeneity, showing that firms in different sectors receive and interpret economic signals differently, leading to varied expectations and actions. This aligns with information asymmetry models, where one party in a transaction has more or better information than the other party, leading to market inefficiencies and suboptimal outcomes (Akerlof, 1970; Spence, 1973; Stiglitz, 1975).

Another explanation, built on the noisy information model developed by Woodford (2001), posits that firms receive noisy signals, making it challenging to distinguish between true and spurious information. Consequently, agents form different expectations about economic variables. While the island model focuses on decentralized information processes, the noisy information model deals with imperfect signals where agents have access to information about the whole economy, but those signals are noisy.

An alternative approach proposed by Mankiw and Reis (2002) emphasizes infrequent information updating, which leads to delays in the adjustment of expectations and economic variables. Their sticky information model highlights information rigidity, where firms update their information sets only periodically due to limited resources and the costs associated with acquiring new information. As a result, pricing and production decisions adjust gradually, reflecting outdated information and contributing to persistent deviations from optimal responses.

2.2 Empirical Evidence

Empirical studies indicate that firm- or industry-specific characteristics may explain differences in expectation errors to some extent. Firm-level variables such as size, age, productivity, better management practices, and location are found to be related to firm expectation errors on prices and production. Managers often base their inflation expectations on personal experiences and idiosyncratic price variations (Madeira and Zafar, 2015; Kumar et al., 2015). Bachmann and Elstner (2015) state that firms with higher leverage ratios tend to be more optimistic about their future production and sales, often leading to expectation errors. As pointed out in theoretical perspectives, Andrade et al. (2022) highlight the importance of localized information, such as industry- and sector-specific conditions, in shaping firms' expectations and responses to shocks. This illustrates how firms rely heavily on industry-specific signals, even when these signals do not reflect broader aggregate trends.

Existing research has also discussed the production errors across surveys and their implications for welfare. Using German manufacturing data, Bachmann and Elstner (2012) show that 6-35% of

firms consistently over- or under-predict their quarterly production. Enders et al. (2022) demonstrated that firms expecting increased production are 15 percentage points more likely to raise current production and prices.

Our analysis will focus on expectation errors for firm level variables, namely sales and exports, and macro variables such as CPI and PPI inflation rates. This will allow us to compare different expectation errors and analyze the determinants of macro and firm-specific variables' expectations. Several papers investigate firms' macro and micro-level expectation together. Among those, Bloom et al. (2021) show that better-managed firms are able to make more accurate forecasts for both macroeconomic variables like GDP and their own micro-level outcomes such as turnover. However, it also indicates that firms generally find it more difficult to forecast their own turnover than to forecast GDP, as evidenced by the larger expectation errors and greater uncertainty in turnover forecasts compared to aggregate forecasts.

2.3 Country-Specific Studies

Country-specific conditions play a role in the divergence of inflation expectations. For example, variations in the exchange rate for countries with a history of dollarization and high inflation can be a factor in determining the divergence in inflation expectations. High inflationary environments create a divergence of inflation expectations (EC, 2023). Moreover, inattention to recent inflation or monetary policy can be the source of divergence between expectations (Coibion and Gorodnichenko, 2015). In countries with volatile economic conditions, firms tend to be more attentive to monetary policy and inflation dynamics (Afrouzi et al., 2020; Karlova et al., 2019). Although there is divergence, on average, countries with a history of high and volatile inflation are more informed about the central bank's inflation target (Candia et al., 2023). For example, firms in the U.S. and New Zealand, characterized by low and stable inflation environments, are less attentive to both inflation and monetary policy (Candia et al., 2024; Coibion et al., 2018; Coibion and Gorodnichenko, 2015).

2.4 Exchange Rate Volatility

We also examine macro uncertainty, particularly exchange rate volatility, specific to an open economy such as Türkiye. The exchange rate is a critical variable in Türkiye for economic agents and the government, as the economy is highly dollarized. Volatility in exchange rates can lead to higher costs for businesses that rely on imported inputs, which is significant for an economy such as Türkiye's that is heavily dependent on imported inputs. Therefore, exchange rate volatility, as a proxy for uncertainty, is a key variable affecting pricing, production, exporting, investment, and employment decisions.

Estimations show that exchange rate pass-through to domestic prices has already reached 50 percent in recent years. Similarly, the correlation coefficient between exchange rate expectations and one-year-ahead inflation rates has been calculated to be over 90 percent in recent years Kara and Sarıkaya (2024). These findings show that Türkiye is one of the developing countries whose inflation rate is most sensitive to foreign exchange movements. Akyürek and Kutan (2006) show that exchange rate volatility has significant impact on inflation rates, monetary policy decisions, activity, and economic stability.

Aslan et al. (2015) show that macro and micro uncertainties perceived by firms within the Business Tendency Survey in Türkiye have a strong negative impact on their production and investment decisions. Exchange rate volatility has significant implications for Turkish exports as well. Some studies find that increased volatility negatively affects exports by raising uncertainty and transaction costs. For example, research by Demez and Ustaoglu (2012) highlights that exchange rate volatility had a negative impact on Turkish exports during 1992-2010. According to Tarakçı et al. (2022), exchange rate volatility affects exports in opposite directions in the short-run and long-run. Specifically, exchange rate volatility generally increases Türkiye's exports in the short-run but decreases them in the long-run. Belke and Gros (2001) discuss the broader impacts of exchange rate volatility on economic activity, emphasizing the real impacts on employment and production decisions. Atabek-Demirhan and Gürcihan-Yüncüler (2017) highlight foreign demand uncertainty, closely linked to exchange rate volatility, as the most significant factor negatively affecting employment growth in Turkey's manufacturing sector.

3. Data and Descriptive Statistics

3.1. Data Sources

This study utilizes unique firm-level data from the Business Tendency Survey (BTS) database and Company Accounts Statistics. Both datasets are sourced from the Central Bank of the Republic of Türkiye (CBRT). The CBRT conducts the BTS monthly with a representative sample of 2800-3500 manufacturing firms, depending on the survey period. The BTS contributes to the construction of the Real Sector Confidence Index (RSCI), a composite indicator that provides a comprehensive overview of the general economic outlook by evaluating responses to different questions in the BTS survey. The survey particularly includes inquiries about current business conditions, future expectations, and factors influencing production, sales and other activities. The purpose of the BTS is to generate indicators that measure short-term trends in the manufacturing industry. The BTS dataset spans from January 2007 to June 2024, covering 16 years of monthly observations. Conducting surveys of firms presents several challenges, including reaching the desired respondents

within firms, convincing them to participate, and ensuring the survey's relevance and brevity. Many surveys struggle to achieve a representative sample, obtain higher frequency data, and capture firm-specific characteristics such as size and age. Additionally, they often use inflation rates related questions but they rarely cover firm-level questions associated with sales, exports etc. (Coibion et al., 2020; Candia et al., 2023). Given the time frame, frequency, sectoral representation, and coverage of non-inflationary questions, as well as being conducted by a national authority which ensures a high response rate, the BTS provides a robust source of data for our analysis.

The second data source we use is the Company Accounts Statistics, which is compiled from the financial statements of real sector enterprises. These financial statements are sourced from the Revenue Administration. The data includes balance sheets and income statements for all firms in Türkiye. We have exploited the data to gather information on firm-level financial metrics (liquidity ratio, the share of short-term liabilities and leverage ratio), employment, sales and export share.

These two sources of data have been merged using firm-level tax identification numbers for manufacturing firms.[1] The producer price index (PPI) is used to convert nominal values into real terms. The merged data consist of 4038 firms. The average monthly response rate is 80%. On average, a firm responds in 68% of the months they are in the panel. All firm level variables, except export shares are winsorized at 1 percent to deal with potential outliers.

In addition to firm-level variables, to measure uncertainty, we have used several other indicators to capture broader economic conditions and external factors that may influence firms' expectations. These indicators include the dollar/TL implied exchange rate volatility (FX Volatility), which reflects the uncertainty in the currency market and its impact on firms operating in a highly dollarized economy like Türkiye. Furthermore, we incorporate the Chicago Board Options Exchange Volatility Index (CBOE VIX), which serves as a proxy for global financial uncertainty and investor sentiment. Another critical variable is the average cost of funding of CBRT (ACF), which we use as a measure of the policy rate in the Turkish financial system. The average cost of funding reflects the Central Bank's monetary policy stance and its influence on the cost of borrowing for firms. Changes in the policy rate can affect investment decisions, production levels, and overall economic activity. Table 1 presents the descriptive statistics related to these key variables.

[1] One challenge we encountered during the data manipulation relates to the distinction between single-unit and multi-unit establishments in the dataset. The company accounts are at enterprise level while the BTS is at establishment level such that several establishments can be associated with a single enterprise. For instance, if a firm operates factories in different cities, each factory may report its own set of expectations, leading to inconsistencies. These multi-unit firms have a single tax number and sales data originating from company accounts while their expectations data coming from BTS are distributed across multiple local units. As a solution, we've decided to focus on single-unit firms for the time being (multi-unit firms are 2.5% of observations).

Table 1: Descriptive Statistics

	min	max	mean	p50	sd	N
Export Share	0.00	1.00	0.28	0.18	0.29	297211
Leverage Ratio	0.06	1.30	0.57	0.59	0.25	297800
Short-term Liability	0.17	1.00	0.78	0.84	0.22	297770
Liquidity ratio	0.44	15.20	2.35	1.58	2.32	297754
Employment	0	16885	521	269	848	297800
Sales	14.10	21.45	17.63	17.59	1.38	297800
FX Volatility	4.83	61.16	14.71	12.88	7.18	297800
CBOE VIX	10.13	57.74	19.17	17.43	7.32	297800
ACF	4.85	51.36	12.21	9.01	8.00	297800

3.2. Construction of Expectation Errors

In our analysis, we use micro-data from the BTS to measure expectation errors for sales, exports, the CPI and PPI inflation rates. The survey asked respondents:

- Question 17: "What is your expectation for the total order quantity for the next three months?"
- Question 12: "What is your expectation for the export order quantity for the next three months?"

Responses were categorized as follows:

- 0 = No response
- 1 = Increased / Will increase / Above normal
- 2 = Stayed the same / Will stay the same / Seasonal normal
- 3 = Decreased / Will decrease / Below normal

Expectation error $e_{i,t,h}$ with regard to sales or exports is calculated using the realization of a firm-specific variable $\xi_{t,h}$ over h months, where $\xi_{t,h} = \sum_{j=j}^{h} \xi_{t+j,1}$ following Bachmann et al. (2013). The expectation of this variable is $\xi_{t,h|t}$.

$$e_{i,t,h} = \begin{cases} 0 & \text{if } \operatorname{sgn}(\xi_{t,h}) = \operatorname{sgn}(\xi_{t,h|t}) \\ \frac{1}{h}\left(\xi_{t,h} - \xi_{t,h|t}\right) & \text{otherwise} \end{cases}$$

If the sign of the aggregate realization $\xi_{t,h}$ matches the expectation $\xi_{t,h|t}$, there is no expectation error. Otherwise, the expectation error is the average of the differences between the realized and expected values over the period. Based on this methodology, the expectation errors range between – 4/3 and 4/3. That is, expectation errors take both positive and negative values and they show whether firms are pessimistic or optimistic, respectively. In order to test the accuracy of the expectations, we test the determinants of the absolute values of expectation errors for sales and exports.

We also calculate the absolute expectation errors for CPI and PPI inflation rates. As the responses are in quantitative point estimates, the calculation of estimation errors is more straightforward, as we have point estimates for both CPI and PPI inflation expectations. We use numerical inflation expectations at the firm level to construct our expectation errors for 12-month-ahead consumer price inflation and producer price inflation. Specifically, for CPI and PPI inflation expectations, we use aggregate monthly CPI and PPI values, drawing on responses to the following questions:

- Question 29: "What is your annual consumer price inflation expectation for the end of the next twelve-month period?"
- Question 26: "What is your annual producer price inflation expectation for the end of the next twelve-month period?"

The expectation error is defined as the absolute value of the difference between a firm's 12-month-ahead inflation expectation in a given month and the ex-post realized inflation rate observed in next 12 months (see D'Acunto et al., 2019). We normalized this difference by dividing the absolute values by realized inflation rates observed in next 12 months to smooth the series. Absolute expectations errors reflect the accuracy of the inflation rates expectations.

AEE^{CPI_N}= Abs ((Question 29 - CPI inflation for next 12 months)/CPI inflation for next 12 months)

AEE^{PPI_N}= Abs ((Question 26 - PPI inflation for next 12 months)/PPI inflation for next 12 months)

Tables 2 and 3 provide the descriptive statistics and cross-correlations between macro (inflation rates) and micro (sales and exports) expectation errors. Expectation errors for CPI and PPI inflation rates are winsorized at 1 percent to deal with potential outliers. The expectation error for sales (EE^{sales}) and exports (EE^{exp}) ranges from -1.33 to 1.33, with a mean close to zero, indicating that on average, the expectations are relatively unbiased. Specifically, the mean expectation error for sales is 0.04 and for exports is -0.05, suggesting a tendency for overestimation in sales and underestimation in exports. The absolute expectation errors for sales and exports (AEE^{sales} and AEE^{exp}) reflect the accuracy of the expectations. Smaller values closing to zero suggest that firms'

expectations are more accurate. The mean and median values for AEE^{sales} are 0.36 and 0.33, and those for AEE^{exp} are 0.32 and 0.33, respectively, suggesting deviation of realizations from expectations to some extent.

The absolute expectation errors for the producer price index (AEEPPI) and the consumer price index (AEECPI) are high, with maximum values of 128.6 for PPI and 66.6 for CPI. This indicates significant deviations between expected and realized inflation rates. The mean absolute expectation errors for PPI and CPI are 17.70 and 8.97, respectively, highlighting substantial forecast inaccuracies. The standard deviations for these errors, 27.95 for PPI and 14.70 for CPI, further emphasize the challenges in accurately predicting inflation rates. In contrast, as reported in Table 2 standard deviation of normalized absolute expectation errors for inflation rates (AEEPPI_N and AEECPI_N) are smaller, indicating that when normalized, the errors are more stable and less dispersed.

Table 2: Summary Statistics

	EE^{sales}	EE^{exp}	AEE^{sales}	AEE^{exp}	AEE^{PPI}	AEE^{CPI}	AEE^{PPI_N}	AEE^{CPI_N}
Min	-1.33	-1.33	0.00	0.00	0.14	0.07	0.01	0.01
Max	1.33	1.33	1.33	1.33	128.61	66.62	2.89	1.92
Mean	0.04	-0.05	0.36	0.32	17.70	8.97	0.80	0.40
Median	0.00	0.00	0.33	0.33	6.67	3.35	0.69	0.31
SD	0.48	0.43	0.32	0.29	27.95	14.70	0.58	0.35
N	257212	237152	257212	237152	260110	241445	260110	241445

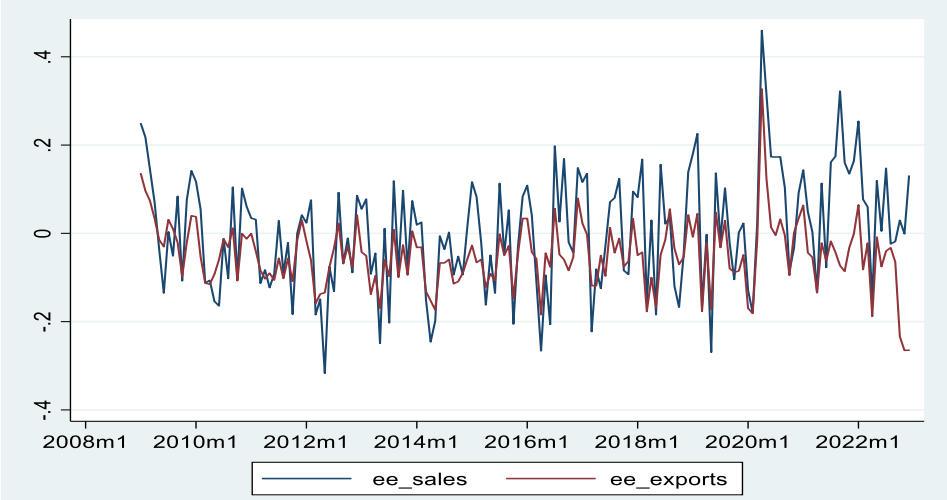
The correlation matrix depicted in Table 3 shows that the expectation errors for sales and exports are correlated (0.35) while the correlation between absolute expectation errors for these variables are weakly correlated (0.12). The correlation between absolute expectation errors for CPI and PPI is very high (0.92). However, correlation between normalized absolute expectation errors for CPI and PPI is realtively low (0.58). These findings suggest that errors in predicting inflation measures are closely related, likely due to common underlying economic conditions such as input costs, exchange rate affecting both indices. In interpreting these findings, it is crucial to consider the definitions of expectation errors. The micro and macro forecasts are not comparable as the former, dealing with sales and exports, is based on qualitative responses, while the latter (CPI and PPI inflation rates) focuses on quantitative responses.

Table 3: Correlation Matrix

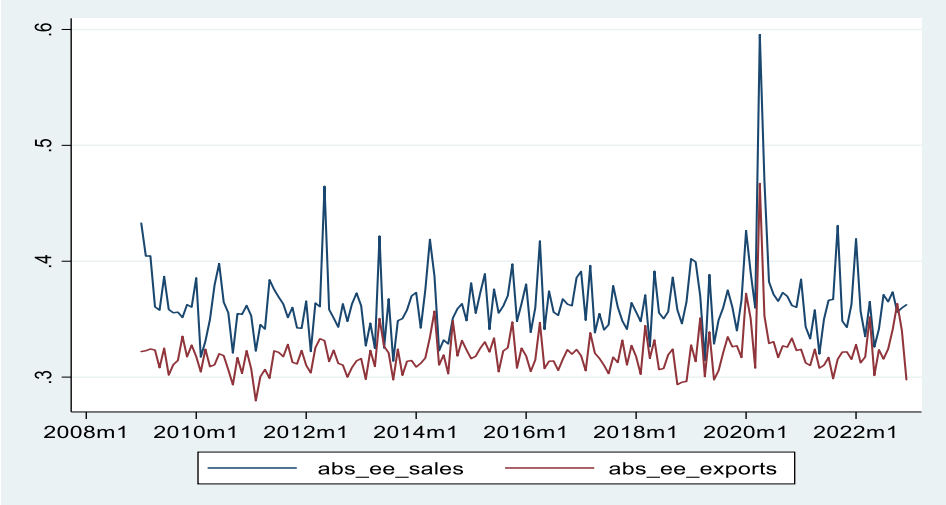
	EE^{sales}	EE^{exp}	AEE^{sales}	AEE^{exp}	AEE^{PPI}	AEE^{CPI}	AEE^{PPI_N}	AEE^{CPI_N}
EE^{sales}	1	0.35	0.03	-0.03	0.08	0.07	0.04	0.02
EE^{exp}		1	0.04	-0.15	-0.00	0.00	0.01	0.01
AEE^{sales}			1	0.12	-0.00	-0.00	0.01	-0.00
AEE^{exp}				1	-0.00	-0.00	0.01	-0.01
AEE^{PPI}					1	0.92	0.60	0.38
AEE^{CPI}						1	0.46	0.52
AEE^{PPI_N}							1	0.58
AEE^{CPI_N}								1

Figure 1: Expectation Errors for Sales and Exports

Panel 1: Average Expectation Errors



Panel 1: Average Absolute Expectation Errors

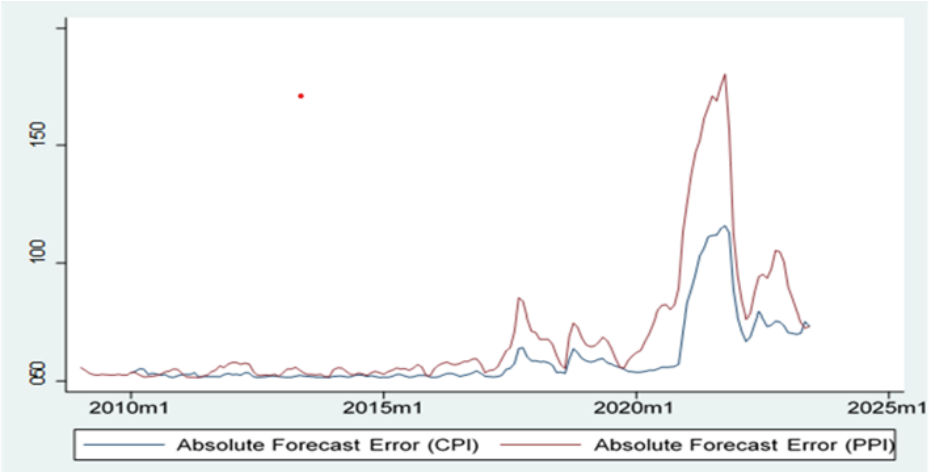


Figures 1 and 2 show the time series outlook of the expectation errors. The expectation errors for both sales and exports in Figure 1 (Panel 1) fluctuate significantly throughout the period of study with

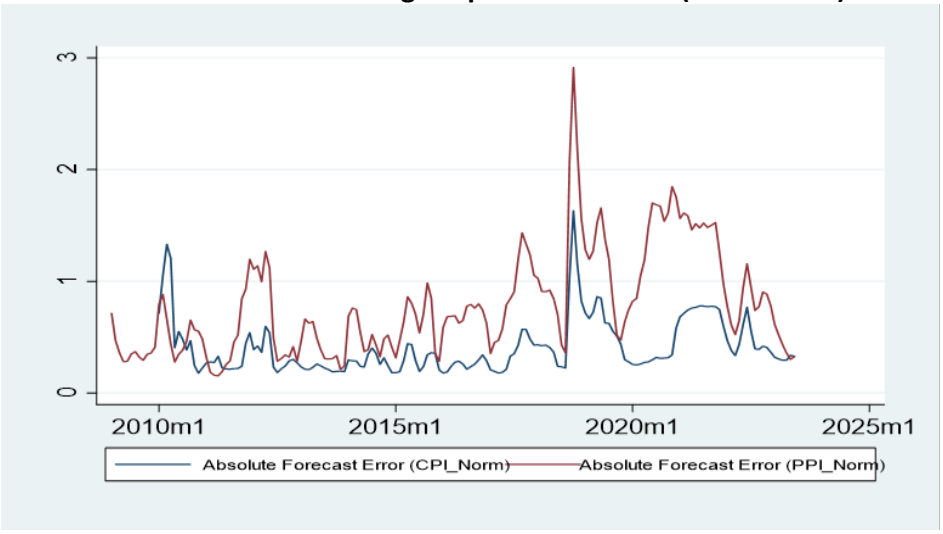
increased spread after 2018- 2019. This variability indicates that Turkish firms' ability to predict their sales and exports changes over time, influenced by various internal and external factors specific to the Turkish economy. The absolute expectation errors for sales is larger than the absolute expectation errors for exports throughout of the period in Panel 2. In Figure 2, we provide two sets of expectations errors for inflation rates, actual (Panel 1) and normalized (Panel 2) expectations errors. We observe an increased uncertainty and larger expectation errors, when compared to micro forecast, after 2018-2019 reflecting the challenges in accurately predicting these inflation measures in Türkiye.

Figure 2: Expectation Errors for CPI and PPI Inflation Rates

Panel 1: Average Absolute Expectation Errors



Panel 1: Absolute Average Expectation Errors (Normalized)



These findings are consistent with the literature, which suggests that firms' expectation errors are generally small and insignificant on average (unconditionally unbiased), but can be substantial under certain conditions such as volatile inflation, economic uncertainty, industry shocks and lack of information (Candia et al., 2023; Bachmann et al., 2013; Massenot and Pettinicchi, 2018).

We further draw histograms for the expectation errors with respect to the micro and macro forecasts across size groups. Figures 3 and 4 show the distribution of expectation errors with respect to sales and exports by firm size. The expectation errors with respect to sales values are relatively uniform across different firm sizes, except for micro enterprises. Similarly, expectation errors with respect to exports show significant differences, particularly for micro firms as well. Figures 5 and 6 reveal that across all firm sizes, the majority of firms exhibit low absolute expectation errors for the CPI and PPI, indicated by the high density of values near zero. Small and micro firms show particularly low expectation errors, with micro firms having the highest density close to zero. However, medium and large firms exhibit more variability, with longer tails in their distributions, suggesting significant expectation errors. This analysis highlights that while expectation accuracy is generally high, larger firms have a higher propensity for significant errors for CPI and PPI, as also documented by Coibion and Gorodnichenko (2015).

Figure 3: Expectation Error for Sales by Size

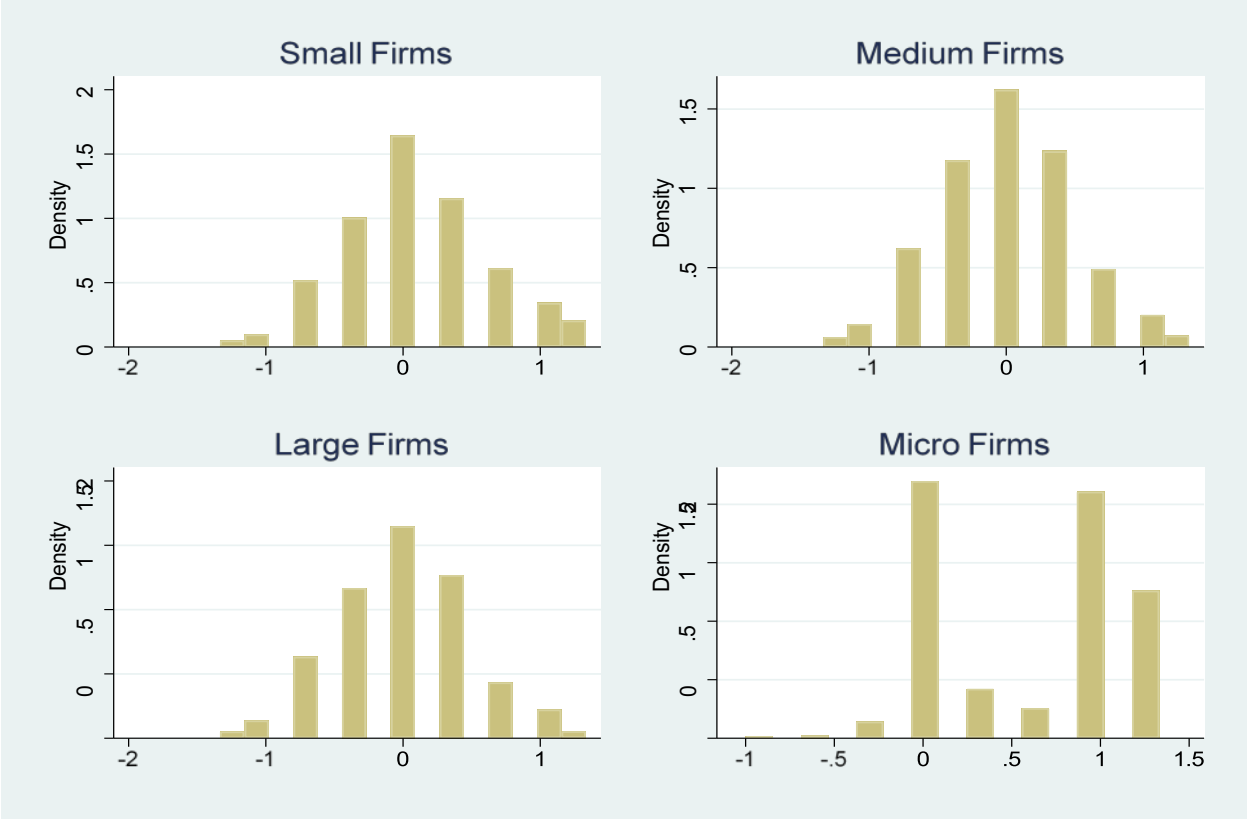


Figure 4: Expectation Error for Exports by Size

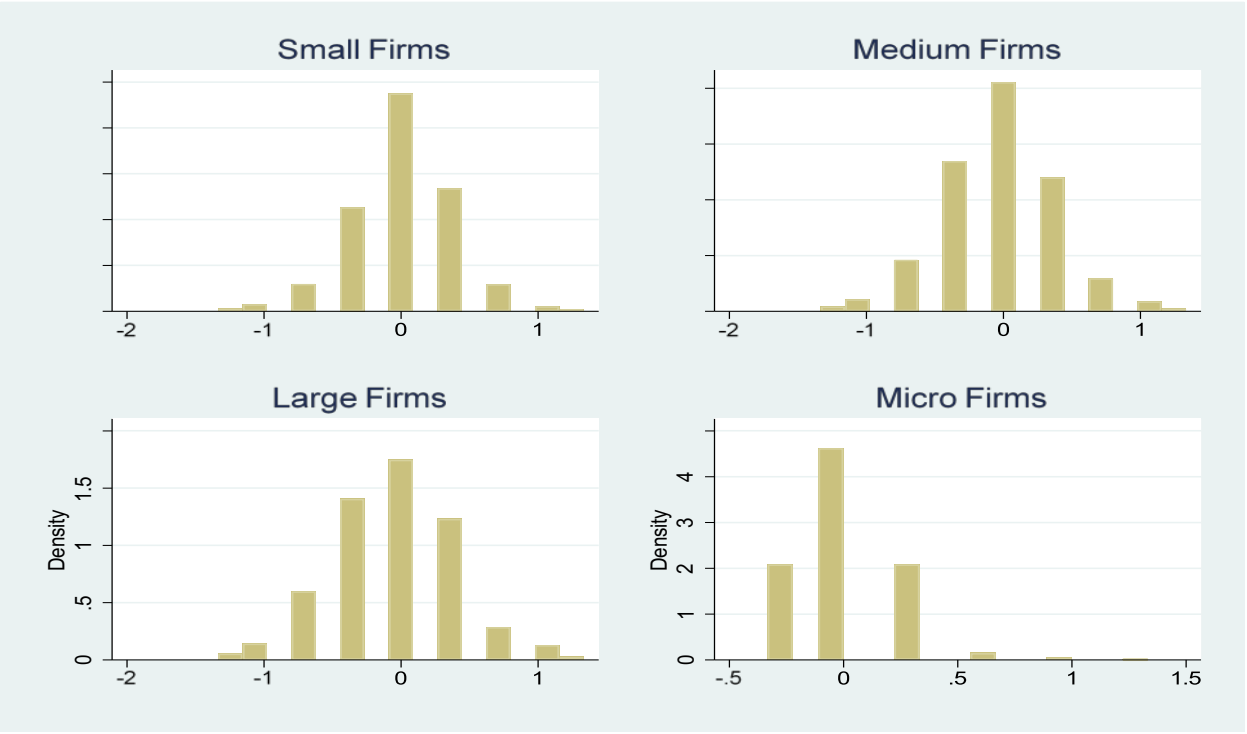


Figure 5: Absolute Expectation Error for CPI by Size

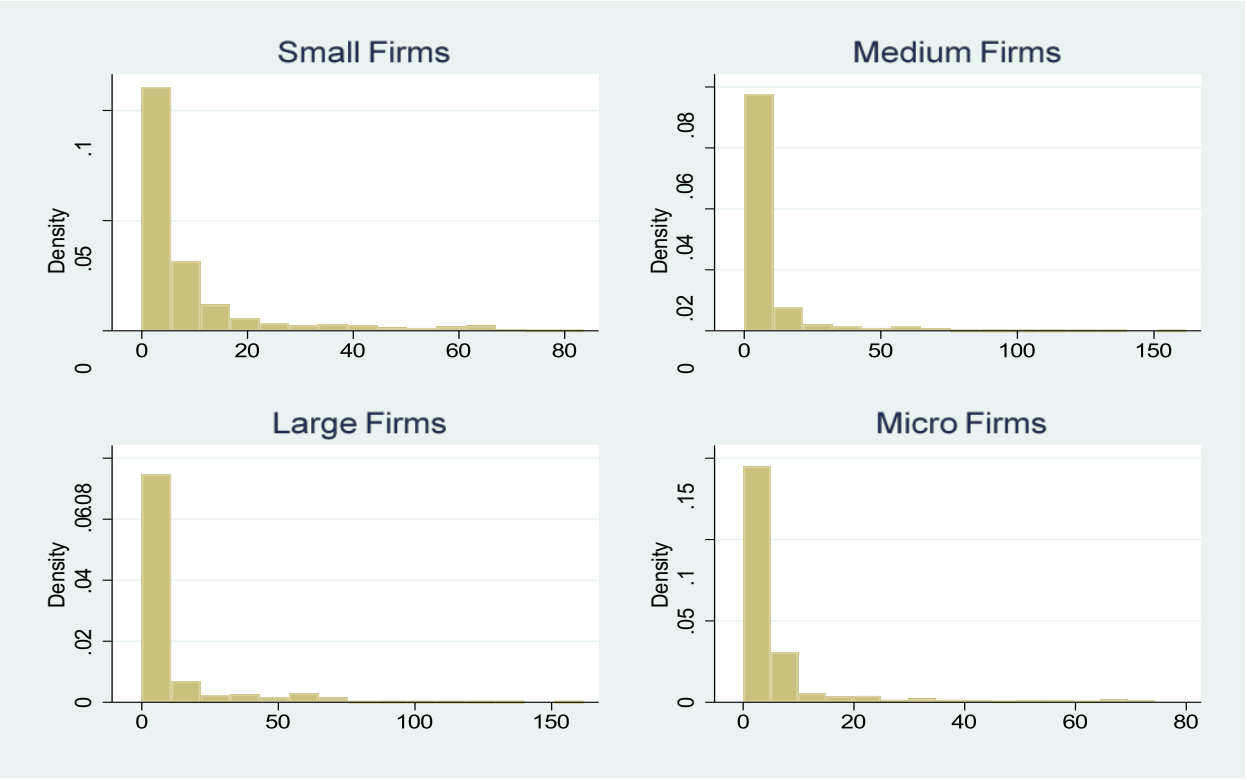


Figure 6: Absolute Expectation Error for PPI by Size

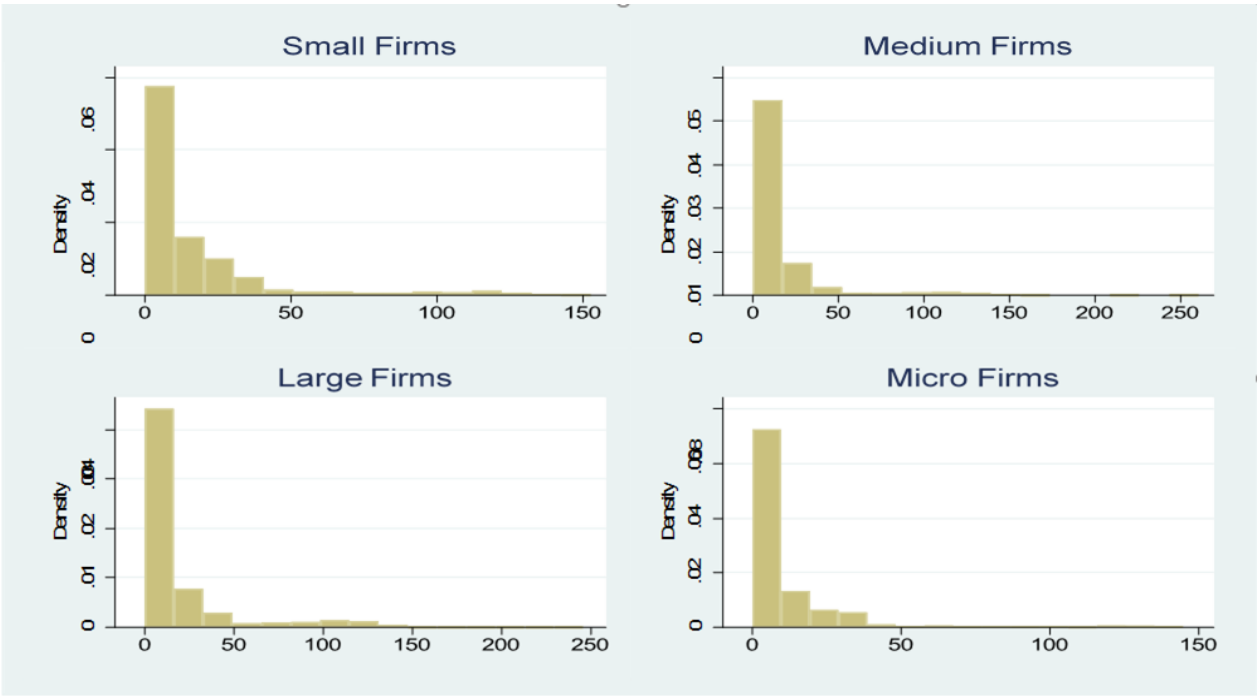
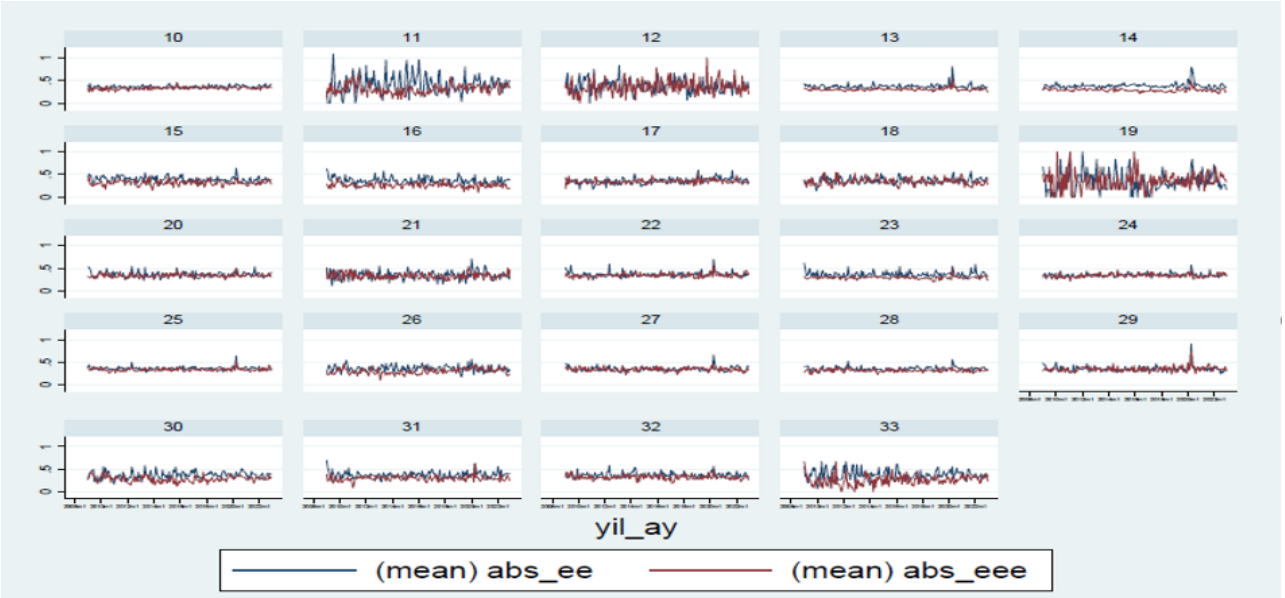


Figure 7 shows absolute expectation errors for sales and exports by sectors. There are significant differences in absolute expectation errors across sectors based on NACE Rev.2 specification, suggesting that sectoral factors may affect the accuracy of expectations. Although the majority of sectors have relatively stable expectation errors over time, the expectation errors of firms in sectors such as beverages (11), tobacco (12), coke and oil (19) whose prices are subject to extensive regulations exhibit extensive fluctuations and thus they are less accurate compared to other sectors.

Figure 7: Absolute Expectation Errors for Sales and Exports by Sectors



3 Empirical Model and Results

We have utilized the following regression equation to analyze the factors influencing expectation errors with regard to sales, exports, CPI, and PPI inflation rates:

$$\text{Expectation Error}_{it} = \beta_0 + \beta_1 \text{Emp}_{it} + \beta_2 \text{Financial Ratios}_{it} + \beta_3 \text{Export Share}_{it} + \beta_4 \text{Macro Variables}_t + \text{SIZE_D}_{it} + n_i + z_t + \epsilon_{it} \quad (1)$$

where *i* stands for firm and *t* for time. We have used three main financial ratios in our analysis: leverage, liquidity, and the share of short-term liability. The leverage ratio measures the extent of a company's debt relative to its total assets, calculated as the summation of short-term and long-term liabilities divided by total assets. If the leverage ratio is high, it indicates that a company is heavily financed by debt relative to its total assets. The liquidity ratio indicates a company's ability to cover its short-term obligations, defined as current assets divided by short-term liabilities. The short-term liability share indicates the proportion of a company's total liabilities that are due within one year. A high share of short-term liabilities is an indicator of financial pressure and increased costs, particularly when the share is high, as it suggests that the company relies heavily on short-term borrowing. Emp represent the employment as a proxy for firm size, and we use the natural log of it to account for potential non-linear effects of firm size. We also use export share of firms to control for domestic and foreign market orientations of firms. Additionally, n_i and z_t represent firm fixed effects and time effects, respectively. Lastly, SIZE_D_{it} represent size dummies to control firm size alternative to employment. All specifications include firm-specific fixed effects to control for unobserved, time-invariant firm characteristics that may affect expectation errors, and time effects to account for temporal variations. The expectation error data is monthly, while financial ratios are of yearly frequency. The estimated equation is based on monthly firm-level observations and estimation are clustered based on time for robustness.

The cross-correlation between financial variables is depicted in Table 4. Due to the correlation between the liquidity and leverage ratios, we treated these variables separately in our regression models.

To capture the uncertainty faced by firms, we used two measures of volatility. The first measure, serving as a proxy for domestic uncertainty, is the volatility of the USD/TRY exchange rate. The second measure, used to gauge global uncertainty, is CBOE VIX. We also considered the ACF, reflecting the Central Bank's monetary policy stance and its influence on the cost of borrowing for firms.

Table 4: Correlation Matrix

	ST Liability	Leverage Ratio	Liquidity Ratio	Export Share	ln(Sales)	ln(Emp/BSheet)
ST Liability	1.0000	-0.2688	-0.1269	0.0198	-0.0969	-0.1289
Leverage Ratio	-0.2688	1.0000	-0.5868	0.0037	0.0496	0.0362
Liquidity Ratio	-0.1269	-0.5868	1.0000	-0.0151	-0.0530	-0.0666
Export Share	0.0198	0.0037	-0.0151	1.0000	0.0690	0.1188
ln(Sales)	-0.0969	0.0496	-0.0530	0.0690	1.0000	0.7373
ln(Emp/BSheet)	-0.1289	0.0362	-0.0666	0.1188	0.7373	1.0000

4 Hypotheses

Drawing on the empirical literature, we propose hypotheses regarding expectation errors for micro variables (sales and exports) and macro variables (CPI and PPI inflation rates). Negative (positive) expectation errors for sales and exports reflect that firms are optimistic (pessimistic), meaning their forecasts overestimate (underestimate) the realized values. On the other hand, larger absolute expectation errors for inflation rates indicate poor accuracy in firms' predictions. In analyzing these errors, we faced two potential approaches: focusing on bias (whether forecasts systematically deviate in one direction) or accuracy (the magnitude of deviation from realized values, irrespective of direction). To ensure a consistent measure of forecasting performance, we chose to focus on accuracy. Therefore, we use the absolute values of expectation errors for sales and exports as the dependent variable in our regression analysis.

Hypothesis 1: Company Size

The literature suggests that firm size matters for the formation of expectations (Born et al., 2022; Bachmann and Elstner, 2015). As documented in these papers, firm size significantly influences the accuracy or bias of firm expectations. Larger firms tend to have more accurate or less biased expectations compared to smaller firms. This advantage arises from several factors, including greater resource availability for investment in advanced forecasting tools and analytics, better access to market information and trends due to extensive networks and established industry relationships, and the employment of more experienced managers who can better interpret economic signals and trends. Additionally, larger firms are often more diversified, spreading risk across various products and markets, thereby stabilizing their expectations despite market fluctuations.

Larger firms are also expected to have contracts with longer maturities and more information about market conditions in the near future, allowing them to better predict their future sales and exports.

H1: Larger firms have more accurate expectations in both macro and micro forecasts.

Hypothesis 2: Export Share

Recent literature has also documented the impact of export shares on the economic expectations of firms. This may be due to the fact that export contracts or orders are generally more precise and longer-term compared to those of domestic sales, making export expectations more likely to align with the next three months' orders. In contrast, domestic orders can be more volatile and uncertain. As export share increases, the accuracy of expectation errors for total sales may improve due to the reduced proportion of domestic sales in overall sales. Bachmann and Elstner (2015) suggest that larger and exporting firms tend to have more accurate expectations regarding their production growth rates compared to smaller and non-exporting firms. Chen et al. (2018) document lower expectation errors for projected sales among firms experienced in international markets. On the inflation front, Coibion et al. (2018) find that firms selling more of their products abroad have less incentive to track domestic prices and tend to make larger errors regarding aggregate inflation.

> H2: Export shares positively impact the accuracy of micro forecasts and negatively impact macro forecasts.

Hypothesis 3: Leverage Ratio

A high leverage ratio indicates that a company relies heavily on debt financing, making it more vulnerable to external shocks. This vulnerability can lead to higher expectation errors for total sales and exports due to informational asymmetries. According to Bachmann and Elstner (2015), firms with higher leverage ratios tend to be overly optimistic about their future performance, resulting in significant expectation errors.

However, leveraged firms might be more attentive to macroeconomic variables, such as inflation rates, as these factors directly affect their debt obligations. This attention could, in theory, lead to more accurate inflation predictions, although no empirical findings currently support this relationship. Conversely, high leverage can also signal a potential mismanagement, which could introduce greater expectation errors for macroeconomic variables.

> **H3**: The leverage ratio negatively impacts the accuracy of micro forecasts, while its effect on macro forecasts remains ambiguous.

Hypothesis 4: Short-Term Liabilities Share

Financially healthy firms are expected to have lower expectation errors compared to their less financially stable counterparts. During economic downturns or financial crises, firms with stronger financial health are better positioned to absorb shocks and adjust their expectations accurately. Almeida et al. (2014) demonstrate that financially healthy firms are more adaptable in their forecasting and strategic responses during periods of financial stress. Firms with higher short-term

liabilities shares are more constrained in accessing long-term finance at relatively lower costs and are thus financially distressed and unhealthy, expected to have higher expectation errors particularly for sales and exports. When it comes to macroeconomic forecasts, similar considerations apply as with leveraged firms.

> **H4:** There is a positive correlation between the short-term liability share and expectation errors by firms, while its effect on macro forecasts remains ambiguous.

Hypothesis 5: Liquidity Ratio

Firms with higher liquidity ratios are better able to manage their future orders, which reduces expectation errors in their activities (Almeida et al., 2014). We expect lower expectation errors for sales and exports for firms with higher liquidity ratios. However, the literature remains limited on the relationship between a firm's liquidity position and macroeconomic forecasts, implying an absence of a clear prediction, similar to the arguments for both short-term liabilities share and leverage ratio.

> **H5:** There is a negative correlation between the liquidity ratio and the accuracy of micro forecasts, while its effect on macro forecasts remains ambiguous.

Hypothesis 6: Volatility Measures

The literature reveals that volatility is a significant source of uncertainty that impacts firms' expectations and the accuracy of their forecasts. Firms facing volatility often experience greater expectation errors and may face difficulties in planning decisions. Hakkio and Keeton (2009) found that firms exposed to higher exchange rate volatility tend to experience larger discrepancies between their forecasts and actual outcomes due to significant deviations from expected revenue and cost structures. In a highly dollarized economy like Türkiye, exchange rate volatility or external volatility can be main sources of uncertainty, leading to larger expectation errors for economic activity. However, during volatile times, firms may pay more attention to macro figures such as inflation rates, leading to lower inflation expectation errors. In countries with volatile economic conditions, firms tend to be more attentive to monetary policy and inflation dynamics, which may lead to more accurate inflation expectations (Afrouzi et al., 2020; Karlova et al., 2019).

> **H6:** Exchange rate volatility decreases the accuracy of micro forecasts while increasing the accuracy of macro forecasts.

Hypothesis 7: Monetary Policy

The literature shows that monetary policy actions can influence firms' expectations. Quantitative easing has been found to increase firms' price and wage inflation expectations Boneva et al. (2018). Eminidou and Zachariadis (2022) observed that following an interest rate hike, firms initially deviate from perfect information models but adjust their expectations through a learning process.

Moreover, when firms receive information about major monetary policy reforms targeting inflation control, they tend to lower both their inflation and cost expectations, as well as temporarily reduce their GDP growth forecasts Caruso-Bloeck et al. (2023).

In the Turkish context, however, higher interest rates often coincide with inflationary pressures, typically resulting from sudden shifts in capital flows and subsequent exchange rate depreciations. Therefore, monetary policy changes are frequently characterized by uncertain domestic economic conditions. Forward guidance is less effective under such inflationary pressures, leading to ambiguous and time-varying impacts on macroeconomic expectations. This is also depicted in Figure 2, which shows an increasing magnitude in the absolute expectation errors of CPI and PPI inflation rates.

H7: Higher interest rates decrease the accuracy of micro and macro forecasts.

5 Results

5.1 Expectation Errors for Sales and Exports

We use various firm-specific variables, in addition to macro variables, to test the determinants of absolute expectation errors for firms' total sales and exports. The estimation results are given in Table 5 and Table 6 for the regressions of absolute expectations errors for sales and exports, respectively.

For the **logarithm of employment**, we estimate negative and statistically significant coefficients in all specifications for expectation errors for sales. This indicates that larger firms, as reflected in higher employment levels, tend to have lower sales expectation errors. When firm size dummies (large, medium, small, micro) are used as regressors instead of employment, the coefficients are positive and significant, with larger magnitudes as firm size decreases. This finding supports Hypothesis 1, aligning with the expectation that larger firms possess greater resources to organize orders and access more reliable market information. The literature suggests that smaller firms are more prone to higher expectation errors when forecasting their variables due to limited resources for data collection and weaker internal risk management capabilities (e.g., Massenot, 2018; Morikawa, 2019; Bachmann & Elstner, 2015). On the other hand, the relationship between firm size and export expectation errors is positive, suggesting that larger firms exhibit lower accuracy in export forecasts. This discrepancy can be attributed to the increased complexity and uncertainty involved in managing larger and more diverse export portfolios.

When examining the role of **export share** in determining expectation errors for sales and exports, we observe contrasting results. Firms with higher export shares exhibit positive and statistically significant coefficients for export expectation errors in most specifications. This suggests

that as the export share increases, expectation errors for exports also increase, potentially due to the added uncertainty and challenges of international trade. In contrast, the coefficients for sales expectation errors are statistically insignificant. Export share contributes to greater uncertainty in expectation errors for export while it does not have a significant impact on sales' expectation errors. This finding does not support Hypothesis 2.

For the **leverage ratio and short-term liability share**, we expect positive coefficients, as leverage and the share of short-term liability are typically indicators of a firm's financial health. Historically, the Turkish banking sector has predominantly supplied short-term, Turkish lira-denominated loans, while the Turkish corporate sector has relied on FX-denominated loans with longer maturities for long-term projects. Financially constrained firms, which struggle to access long-term FX loans, often rely on short-term TL-denominated loans. Our findings reveal that the coefficients for the share of short-term liabilities are statistically insignificant but positive in all specifications, weakly supporting Hypotheses 4. The coefficients of leverage ratio are also insignificant for all regressions with varying signs of coefficients, not giving support to Hypothesis 3.

Firms with higher **liquidity ratios** are expected to have lower absolute expectation errors, as liquidity helps meet short-term obligations, reducing financial distress and enabling better order management. However, our results show an insignificant and mostly insignificant relationship between liquidity ratios and expectation errors for sales and exports, not supporting Hypothesis 5.

In the extended model, we add **FX volatility**, which appears to have positive coefficients, indicating that higher volatility has a positive impact on absolute expectation errors for total sales and exports but they are significant only for sales regressions. This partially aligns with Hypothesis 7, as the Turkish economy's high exposure to foreign exchange transactions, due to significant asset and liability dollarization and large current account deficits, makes exchange rate volatility a major source of uncertainty.

We have also used the **CBOE VIX** as a regressor to control for external volatility or risk appetite. Our findings suggest that expectation errors for both total sales and exports are positively associated with the VIX, suggesting that the external volatility reduces the accuracy of expectations for sales and exports. As an additional explanatory variable, we use the **average funding rate** as a proxy for the policy rate of the CBRT to control for the impact of monetary policy. The coefficient of this variable is estimated to be positive and statistically significant for regressions of expectation errors for sales, while it is negative and statistically significant for regressions of expectation errors for exports. Rising policy rates may signal firms to reduce production due to a decline in expected domestic sales, leading firms to be more dependent volatile domestic market, which may result in

higher expectation errors for total sales. However, for exports, we may expect a lower expectation errors as firms try to focus more on external markets to compensate for declining domestic demand. This finding partially supports Hypothesis 7, which claims that increasing rates may increase firm micro expectation errors.

5.2 Expectation Errors for CPI and PPI Inflation Rates

The regression analysis presented in Tables 7 and 8 examines the factors influencing the absolute expectation errors of normalized CPI and PPI inflation rates, respectively, using the same explanatory variables. The results indicate that the determinants of expectation errors for CPI and PPI inflation rates are mostly similar, with no substantial differences in the signs and significance of the variables' coefficients across regressions.

The coefficients for export shares are not significant, which contrasts with Hypothesis 2. This implies that export share is not a determinant of macro expectation errors. Another major difference between the two groups of regressions is that the coefficients for the logarithm of employment are positive and only statistically significant for PPI inflation rates regressions. This finding contradicts Hypothesis 1. Similarly, unlike sales and export regressions, the coefficients for size dummies are not significant for CPI inflation rate regressions, while the coefficients for micro firm dummies are negative and significant in PPI inflation rate regressions. This suggests that smaller firms exhibit lower expectation errors, not giving support to Hypothesis 1.

The coefficients for the short-term liability share are positive and statistically significant in most specifications, supporting Hypothesis 4. This suggests that firms with higher short-term liabilities exhibit larger expectation errors due to financial distress and operational uncertainty, particularly under volatile conditions. The coefficients for the leverage ratio are negative and statistically insignificant, which does not align with Hypothesis 3. In contrast, the coefficients for the liquidity ratio are positive and statistically significant. This may imply that firms with high liquidity are less concerned with inflation forecasting, focusing more on short-term operations, which leads to higher expectation errors.

In contrast to firm-specific variables, the coefficients for macro variables such as FX volatility, VIX, and the policy rate are statistically significant and positive for both absolute expectation errors of CPI and PPI inflation rates regressions. Similar to sales and export regressions, the coefficients for FX volatility and VIX, as indicators of macro uncertainty, are positive. This implies that firms' expectation errors for CPI and PPI inflation rates increase during periods of domestic and global uncertainties. The coefficients for FX volatility are larger in absolute terms for PPI inflation rates, suggesting that firms pay more attention to predicting PPI inflation rates, which are more relevant

for firms' pricing decisions. This may be due to more conservative and careful forecasting practices under volatile conditions. High external and internal volatility reduces the accuracy of expectation errors, in contrary to Hypothesis 6 related to macro forecasts. The coefficients for policy rates are estimated to be positive and significant for both CPI and PPI inflation rate expectation errors, further supporting Hypothesis 7.

6 Discussion of Results

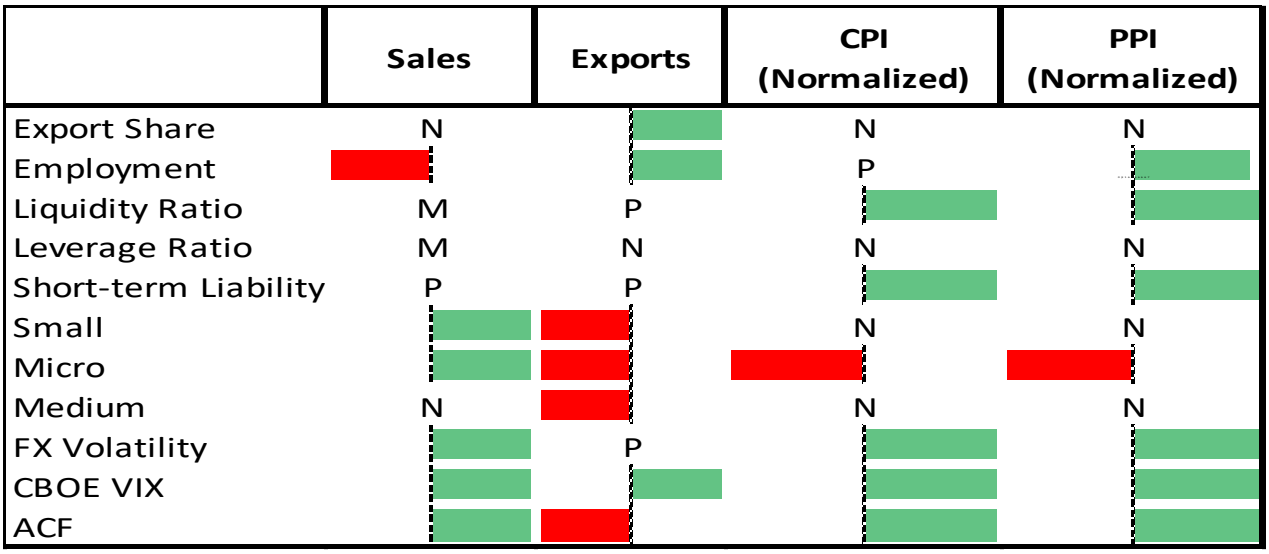
The Figure 8 below, summarizes the findings for the regressions results for various model specifications. There are some differences in the coefficients of regressions run for inflation rates compared to those for sales and exports in terms of magnitude, direction and significance. Green bars show positive and red bars negative estimated coefficients for respective variables. The length of bars indicates the portion of the statistically significant specifications (details are provided below Figure 8).

We document that financial characteristics of firms influence expectations, with differing magnitudes and signs depending on the type of expectation errors. Company size (employment or size dummies) is among the few micro variables that have significant coefficients in most of specifications. While expectation errors for sales decrease with company size, the opposite is observed for exports and PPI inflation rates. In other words, being larger firms in terms of number of employees does not necessarily improve forecast accuracy for inflation rates and exports. Surprisingly, being micro firms is associated with lower absolute expectations errors for inflation rates. This finding may imply that these firms are more likely to form their inflation expectations based on market consensus.[2] Again surprisingly, compony size is positively associated with expectation errors for exports, which can be attributed to volatile and complex demand conditions for larger firms that deal with pressures resulted from highly competitive international markets.

We also find that financial ratios, such as higher liquidity and a higher share of short-term liabilities, amplify inflation expectation errors to some extent, thereby reducing the accuracy of expectations of inflation rates. For micro forecasts, however, the coefficients of financial ratios are not significant across all specifications, suggesting that these variables have limited explanatory power for sales and export expectation errors. These results indicate that the effects of financial health on forecasting accuracy are more pronounced for inflation rates than for firm-level variables.

Figure 8: Regression coefficients

[2] The sample covers only few micro firms (about 50), this finding should be evaluated with caution.



Note: This figure summarizes the explanatory variables and their relationships with micro and macro expectation errors (Exports, Sales, CPI and PPI). Cells contain bars which represent the percentage of significant coefficients across specifications: red bars for negative and green for positive coefficients, and P, N, M indicate non-significant results with positive, negative, or mixed signs, respectively. The higher the bar, the higher the percentage of significant coefficients in different specifications, on a scale from 0 to 100.

When examining the impact of **uncertainty measures**, such as FX volatility and the CBOE VIX, the coefficients are estimated to be positive and statistically significant for both micro and macro expectation errors. This implies that increased domestic and external uncertainty contributes to larger deviations between expectations and realized outcomes. An interesting observation is related to monetary policy: the coefficients for the average cost of funding (ACF) suggest that tighter monetary policy, especially during periods of inflationary pressure, increases inflation expectation errors. This is likely due to rising costs for firms, which create additional challenges in forecasting inflation accurately over the next 12 months.

7. Conclusion

This paper emphasizes the role of volatility of financial markets as well as the financial characteristics of firms in explaining firms' forecast accuracy or expectation errors. Econometrical estimations suggest that the coefficients of explanatory variables vary substantially across regressions run for absolute expectation errors for sales, exports and inflation rates. More specifically, firm-level variables poorly explain expectations errors for both micro and macro variables with exception of size (employment and size dummies), the share of short-term liabilities, liquidity ratio. The accuracy of expectation of sales increases with company size. However, this finding is not valid for expectation errors for exports and inflation rates. In addition, the accuracy of expectations for inflation rates seem to decline with the share of short-term debt and liquidity ratio. The finding for the share of

short-term debt is intuitive as financial constrained firms and those with short maturity in their interactions are more likely to have less accurate expectations.

Macroeconomic variables, including foreign exchange volatility, the CBOE VIX, the policy rate, are found to be significant determinants of expectation errors. Specifically, they are positively associated with expectation errors for sales and inflation rates almost for all specification with positive significance. One exception is that FX Volatility is positively associated with expectation errors for exports but this association not statistically significant. In addition, policy rate is estimated to affect the expectation errors for exports negatively. In short, the main fining of this paper is that the importance of macro volatility or uncertainty in shaping firms' expectations is validated by the empirical evidence. That is, it is estimated that variables representing macro volatility or uncertainty are highly associated with expectation errors for economic activity and inflation rates while firm level variables have less explanatory power for the expectation errors.

Table 5: Regression Results for Absolute Expectation Error (Sales)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Export Share	-0.00732	-0.00725	-0.00631	-0.00722	-0.00718	-0.00719	-0.00727	-0.00716	-0.00631	-0.00714	-0.00709	-0.00711
	(0.00846)	(0.00847)	(0.00839)	(0.00846)	(0.00846)	(0.00847)	(0.00846)	(0.00846)	(0.00839)	(0.00846)	(0.00846)	(0.00846)
Leverage	-0.00142	0.000122	-0.00248	0.000141	0.000215	0.000119						
	(0.00706)	(0.00724)	(0.00703)	(0.00724)	(0.00723)	(0.00724)						
Small			0.0514***						0.0516***			
			(0.0160)						(0.0160)			
Micro			0.224***						0.233***			
			(0.0501)						(0.0512)			
Medium			-0.000939						-0.000942			
			(0.00372)						(0.00372)			
Log Emp	-0.0108***	-0.0108***		-0.0108***	-0.0107***	-0.0108***	-0.0108***	-0.0107***		-0.0106***	-0.0106***	-0.0107***
	(0.00376)	(0.00377)		(0.00377)	(0.00377)	(0.00377)	(0.00376)	(0.00378)		(0.00378)	(0.00377)	(0.00378)
ST Liability		0.00680		0.00679	0.00685	0.00676		0.00759		0.00757	0.00761	0.00754
		(0.00604)		(0.00604)	(0.00604)	(0.00604)		(0.00613)		(0.00613)	(0.00613)	(0.00613)
USD Volatility				0.000540***						0.000541***		
				(0.000124)						(0.000124)		
CBOE VIX					0.00105***						0.00106***	
					(0.000156)						(0.000156)	
ACF						0.000614*						0.000624*
						(0.000342)						(0.000342)
Liquidity							-4.66e-06	0.000201	0.000129	0.000198		0.000198
							(0.000616)	(0.000640)	(0.000611)	(0.000640)		(0.000640)
Observations	255,610	255,605	256,726	255,605	255,605	255,605	255,593	255,593	256,709	255,593	255,593	255,593
R-squared	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.001
Number of id	3,471	3,471	3,494	3,471	3,471	3,471	3,471	3,471	3,494	3,471	3,471	3,471

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Regression Results for Absolute Expectation Error (Exports)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Export Share	0.0732***	0.0731***	0.0747***	0.0731***	0.0731***	0.0730***	0.0731***	0.0731***	0.0747***	0.0732***	0.0732***	0.0731***
	(0.00967)	(0.00968)	(0.00973)	(0.00968)	(0.00968)	(0.00968)	(0.00967)	(0.00968)	(0.00973)	(0.00968)	(0.00968)	(0.00967)
Leverage	-0.00143	-0.000212	-0.000593	-0.000208	-0.000181	-0.000225						
	(0.00762)	(0.00767)	(0.00759)	(0.00767)	(0.00767)	(0.00767)						
Small			-0.0282**						-0.0284**			
			(0.0115)						(0.0114)			
Micro			-0.0485*						-0.0407*			
			(0.0255)						(0.0246)			
Medium			-0.0117***						-0.0119***			
			(0.00411)						(0.00410)			
Log Emp	0.0114***	0.0114***		0.0114***	0.0114***	0.0114***	0.0114***	0.0115***		0.0115***	0.0115***	0.0116***
	(0.00324)	(0.00323)		(0.00323)	(0.00323)	(0.00323)	(0.00323)	(0.00323)		(0.00323)	(0.00323)	(0.00323)
ST Liability		0.00669		0.00669	0.00670	0.00671		0.00844		0.00844	0.00843	0.00848
		(0.00634)		(0.00634)	(0.00634)	(0.00634)		(0.00661)		(0.00661)	(0.00661)	(0.00661)
USD Volatility				7.04e-05						6.98e-05		
				(0.000115)						(0.000115)		
CBOE VIX					0.000287**						0.000286**	
					(0.000135)						(0.000135)	
ACF						-0.000634**						-0.000639**
						(0.000317)						(0.000317)
Liquidity							0.000447	0.000673	0.000378	0.000672	0.000669	0.000678
							(0.000609)	(0.000638)	(0.000606)	(0.000638)	(0.000638)	(0.000638)
Observations	235,763	235,758	236,709	235,758	235,758	235,758	235,746	235,746	236,692	235,746	235,746	235,746
R-squared	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Number of id	3,513	3,513	3,536	3,513	3,513	3,513	3,513	3,513	3,536	3,513	3,513	3,513

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Regression Results for Absolute Expectation Errors (Consumer Price Index, Normalized)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Export Share	-0.0186	-0.0184	-0.0190	-0.0184	-0.0184	-0.0169	-0.0181	-0.0178	-0.0185	-0.0177	-0.0178	-0.0163
	(0.0172)	(0.0172)	(0.0172)	(0.0172)	(0.0172)	(0.0171)	(0.0172)	(0.0172)	(0.0172)	(0.0172)	(0.0172)	(0.0171)
Leverage	-0.0194	-0.0142	-0.0189	-0.0143	-0.0142	-0.0140						
	(0.0147)	(0.0148)	(0.0147)	(0.0148)	(0.0148)	(0.0147)						
Small			-0.0157						-0.0168			
			(0.0219)						(0.0219)			
Micro			-0.0747						-0.0783			
			(0.0593)						(0.0624)			
Medium			0.000481						0.000136			
			(0.00776)						(0.00778)			
Log Emp	0.00493	0.00505		0.00505	0.00508	0.00360	0.00525	0.00581		0.00581	0.00584	0.00432
	(0.00562)	(0.00563)		(0.00563)	(0.00563)	(0.00558)	(0.00562)	(0.00562)		(0.00561)	(0.00562)	(0.00556)
ST Liability		0.0236*		0.0236*	0.0236*	0.0231*		0.0355***		0.0355***	0.0355***	0.0346***
		(0.0122)		(0.0122)	(0.0122)	(0.0121)		(0.0132)		(0.0132)	(0.0132)	(0.0132)
USD Volatility				0.00245***						0.00245***		
				(0.000115)						(0.000115)		
CBOE VIX					0.00134***						0.00134***	
					(0.000133)						(0.000133)	
ACF						0.0517***						0.0517***
						(0.000726)						(0.000726)
Liquidity							0.00255*	0.00354**	0.00231*	0.00353**	0.00354**	0.00339**
							(0.00130)	(0.00141)	(0.00131)	(0.00141)	(0.00141)	(0.00140)
Observations	239,869	239,859	241,001	239,859	239,859	239,859	239,843	239,843	240,975	239,843	239,843	239,843
R-squared	0.173	0.173	0.172	0.174	0.173	0.263	0.173	0.173	0.172	0.174	0.173	0.263
Number of id	3,497	3,497	3,521	3,497	3,497	3,497	3,497	3,497	3,521	3,497	3,497	3,497

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Regression Results for Absolute Expectation Errors (Producer Price Index, Normalized)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Export Share	-0.0721*	-0.0710*	-0.0732*	-0.0710*	-0.0701*	-0.0611*	-0.0705*	-0.0694*	-0.0715*	-0.0695*	-0.0686*	-0.0598
	(0.0400)	(0.0400)	(0.0396)	(0.0395)	(0.0399)	(0.0369)	(0.0401)	(0.0401)	(0.0397)	(0.0396)	(0.0400)	(0.0370)
Leverage	-0.0298	-0.0143	-0.0270	-0.0137	-0.0133	-0.0129						
	(0.0333)	(0.0344)	(0.0332)	(0.0341)	(0.0343)	(0.0325)						
Small			-0.0622						-0.0650			
			(0.0574)						(0.0572)			
Micro			-0.454**						-0.511**			
			(0.196)						(0.199)			
Medium			-0.0240						-0.0246			
			(0.0195)						(0.0195)			
Log Emp	0.0234*	0.0245*		0.0239*	0.0254*	0.0142	0.0248*	0.0263**		0.0271**	0.0256**	0.0157
	(0.0131)	(0.0131)		(0.0129)	(0.0131)	(0.0121)	(0.0131)	(0.0131)		(0.0131)	(0.0129)	(0.0121)
ST Liability		0.0626**		0.0633**	0.0640**	0.0610**		0.0868***		0.0876***	0.0871***	0.0822***
		(0.0288)		(0.0285)	(0.0287)	(0.0275)		(0.0289)		(0.0288)	(0.0286)	(0.0274)
USD Volatility				0.0422***						0.0422***		
				(0.000733)						(0.000733)		
CBOE VIX					0.0411***						0.0411***	
					(0.000450)						(0.000450)	
ACF						0.370***						0.371***
						(0.00387)						(0.00388)
Liquidity							0.00572**	0.00809***	0.00506*	0.00798***	0.00796***	0.00712***
							(0.00277)	(0.00287)	(0.00277)	(0.00285)	(0.00287)	(0.00274)
Observations	258,298	258,288	259,586	258,288	258,288	258,288	258,272	258,272	259,560	258,272	258,272	258,272
R-squared	0.160	0.160	0.160	0.175	0.171	0.329	0.160	0.160	0.160	0.175	0.171	0.329
Number of id	3,577	3,577	3,601	3,577	3,577	3,577	3,577	3,577	3,601	3,577	3,577	3,577

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

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