CONCLUSION

The purpose of this paper is to examine whether the Dax index reflect the behavior of macroeconomic factors and microeconomic indicators in the Germany market. In other words, it aims to determine how the index response to changes in these factors. Based on the observation of macro and micro data combined with mothods include descriptive statistics and Nonlinear Autoregressive Distributed Lag (NARDL) model, the paper conclude that Dax index does reflect the behavior of macro and micro factors but not all of them. Additionally, the paper believed that all negative and positive changes in those factors have different impact to Dax index (asymmetric effects), which is true (to some extent) and has been proved via model result, but this insight isn't applicable to all examined factors in this paper. The detail will be presented in the following summary table:

Table 29. Summary of key findings

Macro factors have asymetrical effect on Dax index: 1. Core CPI (CCPI) 2. Euribor 3 months (E3M) 3. M2 4. Gold futures (GF) 5. Real effective exchange rate (REER)			
Micro factors have asymetrical effect on Dax index: 1. Ebit margin 2. EPS 3. Return on equity (ROE)			
Macro factors			
Long-term*			
Variable	Coefficient	Prob.	Statistical significance
IIP	-1.08	0.02	☒
Trade balance	0.09	0.10	☐
Gold futures	-0.13	0.43	☐
M2:			
Positive Impact of M2	-0.70	0.10	☐
Negative Impact of M2	0.00	0.99	☐
REER			
Positive Impact of REER	0.31	0.73	☐
Negative Impact of REER	0.04	0.97	☐
Core CPI			
Positive Impact of CCPI	1.08	0.08	☐
Negative Impact of CCPI	-0.94	0.25	☐
Euribor 3 months			
Positive Impact of E3M	-0.32	0.58	☐
Negative Impact of E3M	-6.11	0.01	☒
Short-term			
IIP	-0.02	0.91	☐
First lagged of IIP	1.43	0.00	☒
Second lagged of IIP	0.66	0.00	☒
Third lagged of IIP	0.61	0.00	☒
Trade balance	-0.02	0.06	☐

First lagged of Trade balance	-0.11	0.00	☒
Second lagged of Trade balance	-0.06	0.00	☒
Third lagged of Trade balance	-0.04	0.00	☒
M2:			
Positive Impact of M2	0.00	1.00	☐
Negative Impact of M2	-0.71	0.49	☐
Positive Impact of 1st lagged M2	2.14	0.06	☐
Negative Impact of 1st lagged M2	0.57	0.59	☐
Positive Impact of 2nd lagged M2	4.53	0.00	☒
Negative Impact of 2nd lagged M2	-0.86	0.42	☐
Positive Impact of 3rd lagged M2	3.51	0.00	☒
Negative Impact of 3rd lagged M2	-0.53	0.62	☐
Positive Impact of 4th lagged M2	2.26	0.06	☐
Negative Impact of 4th lagged M2	0.55	0.60	☐
REER:			
Positive Impact of REER	-0.77	0.31	☐
Negative Impact of REER	-0.52	0.50	☐
Positive Impact of 1st lagged REER	-2.10	0.01	☒
Negative Impact of 1st lagged REER	0.42	0.60	☐
Positive Impact of 2nd lagged REER	-1.03	0.20	☐
Negative Impact of 2nd lagged REER	1.91	0.03	☒
Positive Impact of 3rd lagged REER	-1.26	0.09	☐
Negative Impact of 3rd lagged REER	1.46	0.07	☐
GF:			
Positive Impact of GF	0.11	0.36	☐
Negative Impact of GF	-0.49	0.00	☒
Positive Impact of 1st lagged GF	0.15	0.21	☐
Negative Impact of 1st lagged GF	-0.36	0.00	☒
Micro factors			
Long-term*			
Variable	Coefficient	Prob.	Statistical significance
Net profit margin (at 1st lag)	-1.75	0.00	☒
ROE:			
Positive Impact of 1st lagged of ROE	-0.27	0.15	☐
Negative Impact of 1st lagged of ROE	-0.62	0.00	☒
Ebit margin			
Positive Impact of 1st lagged of Ebit margin	-0.03	0.97	☐
Negative Impact of 1st lagged of Ebit margin	-0.18	0.85	☐
EPS			
Positive Impact of 1st lagged of EPS	0.16	0.12	☐
Negative Impact of 1st lagged of EPS	0.19	0.08	☐
Short-term			
Net profit margin:			
Net profit margin (at level form)	-1.85	0.00	☒
Net profit margin (at 1st lag)	1.60	0.02	☒
Net profit margin (at 2nd lag)	-0.65	0.30	☐
Net profit margin (at 3rd lag)	-2.35	0.00	☒
Net profit margin (at 4th lag)	-1.55	0.01	☒

Ebit margin:			
Ebit margin (at level form)	0.30	0.59	☐
Ebit margin (at 1ˢᵗ lag)	-0.15	0.81	☐
Ebit margin (at 2ⁿᵈ lag)	0.62	0.34	☐
Ebit margin (at 3ʳᵈ lag)	3.85	0.00	☒
Ebit margin (at 4ᵗʰ lag)	1.37	0.01	☒
EPS:			
EPS (at level form)	-0.16	0.00	☒
EPS (at 1ˢᵗ lag)	-0.56	0.00	☒
EPS (at 2ⁿᵈ lag)	-0.38	0.00	☒
EPS (at 3ʳᵈ lag)	-0.26	0.00	☒
EPS (at 4ᵗʰ lag)	-0.17	0.00	☒
ROE:			
Positive Impact of ROE	3.30	0.00	☒
Negative Impact of ROE	-0.35	0.26	☐
Positive Impact of 1ˢᵗ lagged ROE	4.48	0.00	☒
Negative Impact of 1ˢᵗ lagged ROE	3.43	0.00	☒
Positive Impact of 2ⁿᵈ lagged ROE	0.94	0.14	☐
Negative Impact of 2ⁿᵈ lagged ROE	5.04	0.00	☒
Positive Impact of 3ʳᵈ lagged ROE	2.45	0.00	☒
Negative Impact of 3ʳᵈ lagged ROE	1.08	0.07	☐
Positive Impact of 4ᵗʰ lagged ROE	1.45	0.00	☒
Negative Impact of 4ᵗʰ lagged ROE	0.24	0.61	☐

(*) Regarding of long term, the results generated from NARDL Cointegration relation, therefore, coefficient values need to be reversed the sign as the coefficients reflect the equilibrium relationship between variables

Source: Eviews 13

From that we can answer main 5 questions have been stated from the initial of the paper:

1.What is the nature of the relationship between macro and micro indicators and stock market performance in Germany?

The relationship between macro and micro indicators and the German stock market is inherently dynamic, with macroeconomic variables setting the stage for overall economic conditions and microeconomic indicators determining how well individual firms capitalize on these conditions.

Macro indicators, such as the Euribor 3 months, M2, Real Effective Exchange Rate Index (REER), IIP, Trade balance, Gold futures play a crucial role in influencing broad market sentiment and liquidity. By observing summary table above we can quantify the nature of the relationship between macro and Dax index:

In case of Euribor 3 months, if lower interest rates 1 unit will be reflected by 6.11 unit increasing in Dax index. For M2, at lag 2, a 1 unit increase (expansionary policy) leads to a cumulative 4.53 unit increase in the DAX index, indicating that the DAX reflects the delayed positive impact of increased money supply on market performance over time. For REER, at lag 1, a 1 unit increase in REER results in a cumulative 2.10 unit decrease in the

DAX index. This indicates that the DAX reflects the negative impact of an appreciation in the real effective exchange rate, which may reduce export competitiveness and weigh on market performance. For IIP, the Dax reflect each change in IIP from short-term to long-term period. In long-term, an increase in IIP will be reflected by 1.08 unit increasing in Dax. In short-term, at lag 1, 2 and 3, a 1 unit increase in IIP are reflected in a cumulative 1.43, 0.66 and 0.61 unit increase in the DAX index respectively. For Trade balance, in short-term, at lag 1, 2 and 3, a 1 unit increase in Trade balance are reflected in a cumulative 0.11, 0.06 and 0.04 unit decrease in the DAX index respectively. For Gold futures, in short-term, a 1 unit decrease in Gold futures will be reflected by 0.49 unit decrease in Dax index.

Micro indicators, including Net Profit Margin, EBIT margin, Return on Equity (ROE), are more closely tied to firm-level performance. These metrics provide direct insights into profitability, operational efficiency, and investor confidence. By observing summary table above we can quantify the nature of the relationship between micro and Dax index:

For Net profit margin, for every 1 unit increase in the Net Profit Margin, the Dax index is expected to increase by 1.75 units in the long term. For Ebit profit margin, at lag 3 and 4, a 1 unit increase in Ebit margin will be reflected by 3.85 and 1.37 unit increase in Dax index. For ROE, for every 1 unit increase in the ROE, the Dax index is expected to increase by 0.62 units in the long term and 3.3 units in the short-term.

2.Do positive and negative shocks to macro and micro economic indicators have different impacts on Dax returns? If so then how the stock react to those shocks?

Yes, positive and negative shocks to macro and micro economic indicators have different impacts on stock returns. Positive and negative shocks to macro and microeconomic indicators exhibit distinct and asymmetric impacts on stock returns. For example:

Euribor 3 months: positive shocks like 1 unit lower of Euribor 3 months rate are associated with 6.11 unit rising in the index but the index seem to not reponse much to increase in Euribor 3 moths. The investors may perceive the increase in Euribor rate as an act of control market (like control inflation) in a downturn situation or posible downturn in the near future. As the result, the index response will be varied and make its insignificant.

M2: the Dax index seem to only well reflect positive changes of M2. In lag 2 and 3, an increase of M2 correspond to 4.53 and 3.51 increase in the Dax return correspondingly. Contrast to M2, the Dax index seem to only well reflect negative changes of Gold variable.

ROE: The way that the index respond to positive or negative change in ROE are different. At the immediate time point, the index will increase by 3.3 as a reflection for 1 unit rise in ROE but it won't response to a 1 unit drop of ROE. However, at first lag, 1 unit increase of positive change in the rate will be reflected by 4.48 unit increase in the Dax index. Meanwhile, 1 unit increase in the down of ROE will correspond with 3.43 unit increase in the Dax index. In both case of 1st lag, changes in the rate result in an increase in the Dax index but with different magnitude. In the second case, investor might consider the negative result of ROE is just temparary or less alarming therefore for final conclusion we must

consider the context that lead to the decrease of ROE and the magnitude of that drop as well.

3.How do short-term and long-term dynamics differ in the relationship between macro and micro variables and stock returns?

Short-term dynamics in the relationship are characterized by immediate reactions to new information. For example, changes in monetary policy, such as a reduction in the Euribor rate, can have rapid effects on investor sentiment, leading to immediate market adjustments. Similarly, quarterly updates on microeconomic variables like EPS or ROE drive short-term market behavior as investors reassess profitability and growth potential.

In contrast, long-term dynamics are driven by equilibrium relationships between variables. Macro factors like money supply and REEI influence structural trends in the DAX index over extended periods, while micro variables such as EBIT margin and NPM sustain firm-level competitiveness and valuation. The error correction mechanism highlights how deviations from equilibrium are corrected, ensuring that short-term shocks gradually integrate into long-term market trends. Together, these dynamics illustrate how immediate reactions align with deeper, more stable economic patterns over time.

4.With the quarterly micro factors and monthly macro factors, is there short-run and long-run dynamic relationship of them and the index? How?

There is a clear short-run and long-run dynamic relationship between quarterly micro factors, monthly macro factors, and the DAX index. In the short run, mismatches in data frequency create distinct adjustment patterns. Monthly macroeconomic changes, such as shifts in IIP, Trade balance, M2, REER influence stock valuations with a lag. Quarterly updates on micro factors like Net profit margins, EPS and ROE tend to have immediate effects on stock returns.

In the long run, cointegration between these variables confirms that both macro factors (IIP and Euribor 3 months) and micro factors (Net profit margin and ROE) are tied to the DAX index through equilibrium relationships. Sustained growth in macro factors like IIP or a stable Euribor rate anchors the broader economic environment, while consistent improvements in micro factors like Net profit margin and ROE ensure firm-level resilience and investor confidence. The rapid adjustment speed indicated by the error correction term further emphasizes the interconnectedness of short and long term dynamics, with the system actively correcting deviations to maintain equilibrium.

5.What are the implications of findings in this paper for investment strategies and strategic economic policies?

The findings of this paper offer actionable insights for both investors and policymakers.

From the insights of macroeconomic factors and monthly Dax index, we can tell that the authorities and policymarkers of the Germany market can utilise those factors to adjust or control the performance of the index in unfavourable economy conditions. Since an increase in IIP and rising Euribor rate support the index in the long run, policymakers must

be aware that a steady low borrowing interest rate can be favorable for the stock market. In addition, an increase of industrial index lead to positive response in the index. Moreover, by utilising those macro factors, we could stablise the market in long-run to prepare a good environment for any long-term policy. As for investors, since the index and the macro factors have a long-run equilibrium, they can apply a mean reversion strategy when participating in the stock market. If the index deviates significantly from its expected equilibrium level based on those macro factors, it could indicate for buying or selling opportunities. They can hold long-term positions if they anticipate that the index will revert to its long-run equilibrium. In addition, firms that rely heavily on international sales like automative, chemicals and machinery may face challenges when the euro become stronger, this will give investors a signal to adjust their exposure to export-driven comapanies.

From the isights of microeconomic indicators (financial indicators) of companies in the index and quarterly Dax index, we can tell that investors can gain more benefit from those insights compare to policymakers. For investors, focus on a company ability to generate consistent operational profits is more reliable than looking solely at a result figures, which in turn make analysing profitability combine with operational efficiency offer a better understanding of a company's long-term growth. From the viewpoint of investors, they should prioritize companies in the index that have high and improving net profit and Ebit margin as those indicators reflect better cost control, operational efficiency and sustainable profit generation. And those companies are more likely to perform well in long term and have a stronger impact on the index. However, we should be aware that different industirs will have different margin standard, therefore, investors should adjust ther expectations based on the indutry and look for companies's peers in the sector to make an appropriate decision. As for companies in the Dax, knowing that their business performance is well reflect to the index in equity market via margin indicators could help them build a suitable corporate strategy or raise capital plan. Firms listed on the Dax should focus on enhancing operational performance like optimizing cost structures, improving supply chains and focusing on high-margin products or services to maintain investor attration. In addtion, as we can see the impact of those micro indicators, they all have a certain level of lag, therefore, focusing on long-term strategies will likely have a greater impact on stock than short-term revenue boosts. The companies aslo shouldn't leave out the EPS and ROE factor since they also have significnat impact on the index.

Summary, by answering those questions the paper conclude that it is reasonable to accept the central hypothesis that the DAX index reflects the behaviors of both macroeconomic and microeconomic factors. This is evidenced by the observable short-term reactions along with the long-term cointegration between macroeconomic, firm-level financial performance factors and the stock market index.