

Examining the Asymmetric Impact of Macroeconomic Policy in the UAE: Evidence from Quartile Impulse Responses and Machine Learning

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Summary

This paper examines the asymmetric effects of changes to monetary and fiscal variables on different types of firms in the UAE. By computing impulse responses on selected shock and switching variables, we examine 180 firms listed in the UAE exchanges and find significant asymmetries among financial and non-financial firms and among low- and high-debt firms when there is a shock to macroeconomic monetary or fiscal variables. Quartile analysis shows that firms belonging to the first and last quartile of debt respond negatively to expansionary policies, while middle-quartile firms respond more positively.

Comprehending the cross-firm variation of responses to changes in monetary and fiscal variables is important as it can yield important insights into the expected impact of government policies. The results of this paper demonstrate the importance of comprehending the heterogeneity in the micro characteristics of the underlying corporate environment when evaluating macroeconomic policies. From a policymaker perspective, it can facilitate the design and implementation of policy in the UAE and can help explain the transmission mechanisms towards corporations.

Following up on the "micro-data revolution" and on recent research that has demonstrated the different responses of corporations to macroeconomic policies, our work examines the asymmetric effects of changes in fiscal and monetary macroeconomic variables on the different types of firms in the United Arab Emirates (UAE). We show that different financial and operational characteristics of firms in the UAE lead to asymmetric outcomes on shocks to macro variables. We examine a sample of 180 firms listed in the Dubai Financial Market (DFM) and the Abu Dhabi Stock Exchange (ADX), which we split into subsamples, based on financial and operational characteristics. We select the switching and the shock variables using a machine learning approach for variable selection, namely Random Regression Forests, and then calculate impulse response functions (IRFs). This approach permits us to capture the nonlinear effects of the shock variable on the UAE firms. We show that while firms respond symmetrically to fiscal stimuli, there are asymmetric responses to monetary variables and debt is the primary driving factor behind this asymmetry. We proceed to perform quartile analysis on the firm sample to further examine the differences between firm responses.

Our methodological approach involves a technique called local projections. This approach permits us to construct impulse response functions of an endogenous variable to different shock variables. The local projections approach runs regressions on the endogenous variable for each time period following the shock, over the forecast horizon (which in our paper is 8 quarters after the shock). Impulse responses demonstrate how the endogenous variable responds on each period and can suggest if this response is statistically significant. In addition, we expand the approach to a dual panel methodology, by splitting the firms into subsamples according to their financial and operational characteristics, which we select using

machine learning. We select firm age, size, debt, operational efficiency and profitability as the switching variables (i.e. the variables that distinguish the firms into subsamples) and examine if different types of firms generate different responses. The model also includes control variables to account for possible external effects.

Our work demonstrates the asymmetric impact of policy decisions on firms in the UAE, based on their individual characteristics. Firm responses are not driven by firm age or size, as suggested by previous literature, but are primarily driven by debt, which influences financial and operating decisions. Our quartile analysis also shows that neither very high nor very low indebtedness is desirable as firms in the middle quartiles experience more positive outcomes compared to firms in the extreme quartiles (Q1 and Q4). We have also shown that financial firms tend to experience a negative change in excess returns in response to expansionary monetary variables, which is more profound for high-debt firms. Finally, responses to expansionary fiscal policies are typically symmetric across all types of firms in the UAE, with financial firms experiencing an immediate positive impact.

Our results demonstrate the need for policymakers to examine the demographics of the underlying firm population, when evaluating monetary and fiscal policy decisions. More specifically, we highlight the importance of debt (rather than e.g. age or size) for comprehending expected responses to fiscal and monetary shocks. However, we note that debt ratios are dynamic and are constantly changing. This means that policymakers need to consistently monitor balance sheet data and utilise this information when gauging the potential results of policy changes. Our work has provided a framework under which potential policy decisions can be evaluated. As opposed to symmetric effects, which impact the underlying corporate environment in the same manner, we have shown that the effect of macroeconomic policies is asymmetric across the different types of firms, with the level of debt standing out as the primary determining factor. Despite the fact that our outcomes are based on listed firms in the UAE, we believe that they can be applied or expanded to other similar economies as well, particularly those where the government plays an active role in economic activity.