



Research Paper

## **Comparing the Cash Holdings Speed of Adjustment During Economic Prosperities and Recessions<sup>1</sup>**

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### **INTRODUCTION**

Capital market imperfections make a connection between the level of cash holdings and the firm value. In other words, there is a level of cash holdings at which the entity achieves its maximum value (Gao et al., 2013). It is generally assumed that the actual cash holdings ratio is rapidly approaching the optimal level (Bates et al., 2009). However, several factors, such as financing frictions in the capital market (Dittmar and Duchin, 2011), macroeconomic shocks, financial constraints, and agency costs (Gao et al., 2013), slow down the adjustment speed. Although previous theoretical foundations and foreign research indicate that the effect of macroeconomic conditions on the cash holding's speed of adjustment, in domestic research, has been ignored. It will lead to inaccurate estimates of cash holding's speed of adjustment and the level of deviation from the optimal level. Therefore, to complete and strengthen the previous literature and cover the existing gap, it seems necessary to research in this field. Due to their impact on adjustment costs, institutional factors, and macroeconomic conditions affect not only leverage deviation and its adjustment speed but also various aspects of cash holding decisions (Orlova, 2020). Orlova and Sun (2018) argue that the speed of adjustment during the economic boom is expected to be faster than during the recession.

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Therefore, our purpose is to compare the cash holding's speed of adjustment during economic prosperities and recessions:

**Hypothesis:** The cash holding's speed of adjustment during economic prosperities is faster than during economic recessions.

## MATERIALS AND METHODS

In terms of research purpose, this research is quasi-experimental and correlational, and in terms of the time dimension, the data is retrospective and post-event. To collect financial and accounting data, the Rahavard Nowin database and financial reports published on the Codal website have been used. We collect 2893 observations during 2003-2020. To analyze the data, we used Stata software. To estimate dynamic models and measuring the speed of adjustment and also to test the research hypothesis, panel data and Blandel and Bond's (1998) system generalized method of moments estimator (System-GMM) were used. To measure the optimal level of firms' cash holdings, following Opler et al. (1999), Bates et al. (2009), Orlova and Rao (2018), and Orlova (2020), we estimate the following model by controlling the effects of years and industries. The fitted values of this model are defined as the optimal (target) level of cash holdings:

$$\text{Cash}_{it+1} = \omega + \psi \mathbf{Z}_{it} + \zeta_{it+1} \quad (1)$$

Where  $CASH_{it+1}$  is defined in the first method as the ratio of cash holdings to total assets and in the second method as the ratio of cash holdings to non-cash assets. Also,  $\mathbf{Z}_{it}$  is cash holdings vector variables including *MTB* growth opportunities (ratio of total book value of debt and stock market value to book value of assets), *SIZE* indicates firm size (logarithm of total assets in base ten), cash flow ratio depicted by *CF* (operating cash flows to total assets), *NWC* is net working capital (ratio of the difference between non-cash current assets and current liabilities to total assets), *CAPEX* represent capital expenditures (ratio of changes in fixed assets to total assets), *LEV* is s leverage ratio (ratio of total liabilities to total Assets), *ICFV* shows industry-level cash flows volatility (the median of standard deviation of operating cash flows ratio to total assets at the industry level over the past three years) and *DIVD* represents dividends (dummy variable for cash-distributing firms). The positive (negative) residual values of model (2) indicate that the cash holdings are higher (less) than the optimal level. To measure the cash holdings speed of adjustment, we follow Orlova and Rao (2018) and Orlova (2020) and estimate the following dynamic model:



$$\text{Cash}_{it+1} - \text{Cash}_{it} = \lambda(\text{Cash}_{it+1}^* - \text{Cash}_{it}) + \zeta_{it+1} \quad (2)$$

Finally, to examine the significance of the difference in the speed of adjustment during economic prosperities and recessions, it is first necessary to define these concepts. To determine the period of economic prosperity and recession, we follow Cook and Tong (2010) and use per capita GDP growth. More precisely, the dummy variable DGDPG is equal to 1 (prosperity period) when GDP per capita growth is positive and zero (recession period), otherwise:

$$\begin{aligned} \text{Cash}_{it+1} = & \alpha + (1 - \lambda)\text{Cash}_{it} + \phi_1\text{DGDPG}_{it} + \phi_2\text{DGDPG}_{it} * \text{Cash}_{it} \quad (3) \\ & + (\lambda\psi)\text{Z}_{it} + \vartheta_{it+1} \end{aligned}$$

All variables have been defined previously. According to the research hypothesis, it is expected that the coefficient of the interactive variable  $\text{DGDPG}_{it} * \text{Cash}_{it}$  to be negative and statistically significant.

## RESULTS AND DISCUSSION

The results show that the firms corrected half of the distance between the actual cash holdings and the target level during about 10 months. Furthermore, the results show that the adjustment speed during the economic recession and prosperity periods is about 62% and 77%, respectively. In other words, during prosperity, firms correct half of the deviation from the cash holding ratio over a period of about 8.5 months (5.5 months). Finally, according to the research hypothesis, the results show that cash holding's speed of adjustment during economic prosperities is significantly higher than during recessions.

## CONCLUSION

In recent years, firms have maintained a higher level of cash. This issue has been the focus of researchers in the study of factors affecting the level of cash holdings and the speed of its adjustment (Bates et al., 2009). We first show that Iranian firms set a target cash ratio for themselves and gradually adjust the current cash ratio to achieve it. These results are consistent with Orlova and Rao (2018). Furthermore, the results show that during economic prosperities, Iranian firms adjust their current cash ratio to the target ratio at a speed of about 24% faster than during recessions. These results are consistent with the findings of Orlova and Sun (2018) and Orlova (2020). Overall, the research findings are consistent with the concepts in the trade-off theory.

**Keywords:** Cash Holdings Speed of Adjustment, Target Ratio, Economic Prosperities and Recessions, Trade-off Theory.

**JEL Classification:** G11 .G15 .G18 .G23.

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