

## **Improving Earnings per Share: An Illusory Motive in Stock Repurchases**

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### **1. Introduction**

Improving earnings per share (EPS) has been widely cited by financial managers to justify stock repurchases (Hribar et al., 2006). Other things equal, repurchasing stocks reduces the number of shares outstanding and boosts EPS. In practice, financial analysts and other market participants are closely monitoring and efficiently reacting to financial reports. If investors react to the boosted EPS around repurchase announcements, the positive correlation between the market reaction and the changes in EPS should then be observed. In this note, we find that, in Taiwan, investors do not react to the boosted EPS.

EPS is calculated as the ratio of the earnings available to the number of common shares outstanding. Even if the number of common shares outstanding falls following repurchases, claims that this boosts EPS may not be warranted (Hribar et al., 2006). For example, US firms might decrease their EPS if too much annual earnings are used for repurchasing. To isolate the impact on the numerator, we use a Taiwanese sample of firms that, under regulation, are required to repurchase outstanding shares using retained earnings. This special regulatory requirement makes it possible to improve EPS following repurchases and intuitively leads us to examine whether investors react to the boosted EPS.

First we identify whether the EPS has been improved in Taiwan around the repurchase announcements. Next, we modify the regression model in Zhang (2002)

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to examine the relation between market reaction and changes in EPS. We find that Taiwan's stock market reacts slowly to repurchase announcements and does not exhibit significant response to the improved EPS, which seems to contradict expectations of financial managers. Hence, improving EPS appears to be an illusory motive in stock repurchases.

## 2. Data and Methodology

Taiwanese firms have been allowed to initiate repurchases since August 2000. In light of the international financial crisis in 2007, we select firms that initiated repurchases from August 2000 to July 2006. All data are obtained from the Taiwanese Economic Journal. After excluding firms that made repeated purchases, our sample contains 145 observations.

To confirm whether EPS improved following repurchases, we compare the pre-event and post-event EPSs of those 145 firms. The pre-event EPS is defined as the EPS ratio at the time before actual repurchase; the post-event EPS is defined as the latest available EPS ratio following the repurchase. We use a paired t-test and a Wilcoxon signed-rank test to examine changes in EPS.

To examine whether investors reacted to the improved EPS around the announcement, we modify the model of Zhang (2002). Zhang (2002) indicated that an abnormal return at the announcement is positively related to a firm's announced repurchase percentage target ( $P$ ), which is the percentage of its total shares outstanding that the firm sought to repurchase. Zhang used firm size ( $MV$ ), book-to-market ratio ( $BM$ ), and prior price performance ( $CAR_i(-60, -25)$ ) as control variables in his regression model since Ikenberry et al. (1995) found that the announcement return is related to both firm size and book-to-market ratio, which could be the proxies for information asymmetries. Moreover, based on the undervaluation hypothesis, which asserts that financial managers undertake stock repurchases primarily because their shares are undervalued, the prior price performance is deemed to be a proxy of undervaluation. The calculation on the prior price performance excludes the 25-day period during which the financial managers work on scheduling and carrying out their repurchase plan right after identifying the undervaluation. Therefore, we modify Zhang's regression model as follows:

$$CAR_i(-1, n) = \alpha + \beta \cdot MV_i + \gamma \cdot BM_i + \theta \cdot CAR_i(-60, -25) + \lambda \cdot P_i + \varphi \cdot \Delta EPS_i + \varepsilon_i \quad (1)$$

$$CAR_i(-1, n) = \alpha + \beta \cdot MV_i + \gamma \cdot BM_i + \theta \cdot CAR_i(-60, -25) + \varphi \cdot \Delta EPS_i + \varepsilon_i, \quad (2)$$

where  $CAR_i(-1, n)$  represents the cumulative abnormal returns of firm  $i$  from one day before to  $n$  days after its buyback announcement. Following Zhang (2002),  $n$  can be either 2 or 5. Therefore, the cumulative abnormal returns for firm  $i$  can be computed as:

$$CAR_i(-1, n) = \sum_{t=-1}^n AR_{i,t}, \quad (3)$$

where  $AR_{i,t}$  represents the daily abnormal returns of firm  $i$  on day  $t$  and is estimated by the market model:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i \cdot R_{m,t}). \quad (4)$$

Here  $R_{i,t}$  is the daily return of firm  $i$  on day  $t$ ,  $R_{m,t}$  is the daily return of the market index on day  $t$ ,  $\hat{\alpha}_i$  is the estimated intercept term of firm  $i$ , and  $\hat{\beta}_i$  is the estimated slope coefficient for the market return. We estimate the market model parameters for each repurchase firm using daily returns over the period  $t = -122$  to  $t = -3$ . The  $MV_i$ ,  $BM_i$ , and  $P_i$  are respectively the market value, book-to-market value, and the announced repurchase percentage target of firm  $i$ . Finally, the  $\Delta EPS_i$  represents the changes in EPS for firm  $i$ , which is calculated as  $(EPS_{i,0} - EPS_{i,-1})/EPS_{i,-1}$ . The  $EPS_{i,-1}$  is the EPS ratio at the time before actual repurchase and  $EPS_{i,0}$  represents the latest available EPS number following the repurchase for firm  $i$ . Since the announced repurchase percentage target is closely related to changes in EPS, we also use the model (2) to investigate the market reaction to changes in EPS.

### 3. Results

The test statistics of the paired samples t-test and the Wilcoxon signed-rank test to the repurchase firms are 3.2203 (p-value 0.0002) and  $-3.878$  (p-value less than 0.0001). The results show that the differentials between pre- and post-event EPS are positive and significant around the announcement. We confirm that Taiwanese firms who repurchased shares using retained earnings improved their EPS around the announcement.

We then use the modified regression model of Zhang (2002) to test whether the investors react to the improved EPS in repurchases as financial managers would expect. Due to missing data for  $CAR(-60, -25)$ , only 127 firms are involved in this regression analysis. Results reported in Table 1 show that investors do not react to the changes in EPS around the repurchase announcements. This finding indicates that financial managers may be mistaken about market reaction to improving EPS.

Results from the regression analysis also show that Taiwan's market reacts slowly to the repurchase announcements. In the  $(-1, 2)$  window, none of the predictor variables are significantly related to the response variable. When we enlarge the window to  $(-1, 5)$ , the announced repurchase percentage target relates significantly to the cumulative abnormal return. However, the positive signs on the coefficients of  $CAR(-60, -25)$  and book-to-market items are contrary to the undervaluation hypothesis, which states that firms initiate stock repurchases when they perceive that their shares are undervalued. This finding sheds some light on the debate about stock price protection in Taiwan, since the financial press often claims

that Taiwanese firms undertake stock repurchases to prevent share prices from continuing declines.

**Table 1. Market Reaction to Changes in EPS**

	CAR(-1,-2)			CAR(-1,5)		
Intercept	1.5983 (0.1739)	3.1026* (0.0031)	1.9739 (0.1247)	2.7589* (0.0504)	4.8738*** (0.0001)	2.9542* (0.0556)
CAR(-60,-25)	0.0205 (0.5902)	0.0205 (0.5944)	0.0191 (0.6181)	0.0816* (0.0753)	0.0832* (0.0750)	0.0808* (0.0796)
MV	0.0000 (0.8783)	0.0000 (0.9605)	0.0000 (0.8113)	-0.0000 (0.6132)	-0.0000 (0.4673)	-0.0000 (0.6437)
BM	0.2627 (0.6442)	0.0399 (0.9502)	0.0542 (0.9321)	-0.2358 (0.7287)	-0.3684 (0.6335)	-0.3442 (0.6516)
P	0.4716 (0.1350)		0.4655 (0.1410)	0.7949** (0.035)		0.7916** (0.0374)
$\Delta EPS$		-0.6251 (0.4409)	-0.5934 (0.4623)		-0.3622 (0.7114)	-0.3084 (0.7495)
$R^2$	0.0220	0.0087	0.0263	0.0699	0.0366	0.0706

Notes: P-values are reported in parentheses. \*\*\*, \*\*, and \* represent 1%, 5%, and 10% significance levels, respectively.

#### 4. Concluding Remarks

The main purpose of this article is to identify whether the Taiwanese market reacts to improved EPS after stock repurchases. From the perspective of informational economics, the market should not react to artificial changes in EPS caused by stock repurchases. However, financial managers still declare that they repurchase shares in order to improve EPS. This note finds that the cumulative abnormal returns do not relate to the changes in EPS and argues that the improving EPS is only an illusory motive in stock repurchases.

Our result differs from the finding of Hribar et al. (2006), which suggested that investors on average discount repurchase-induced EPS increase. Hribar et al. (2006) reported that managers in the US can use stock repurchases to meet or beat analysts' EPS forecasting. The repurchase announcement in the US is informative, leading investors to react to the EPS increase. However, under Taiwanese regulation, firms are not allowed to cash out their annual earnings to do the repurchases. The repurchase-induced EPS increase does not reflect a firm's current earnings in Taiwan, yet this explanation helps investors simplify the evaluation of repurchase announcements. Our finding tends to support the efficient market hypothesis since investors can recognize such artificial improvement from financial reports and react appropriately. Therefore, it may be interesting to further explore the information context under different regulatory systems governing repurchases.

Furthermore, it may also be interesting to investigate how the market reacts to a firm that boosts its EPS using repurchases from a long-term perspective. In practice, firms can either redistribute or cancel their buybacks after their repurchases. A redistribution returns the number of shares outstanding to its original level and a cancellation decreases the number of shares outstanding permanently. We believe the markets should react differently to the ways a firm processes buybacks since the eventual outcome conveys information about the firm's future EPS.

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