The Real Effect of Primary and Secondary Equity Markets on Firm Performance: Evidence from Indonesia

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Abstract

The purpose of this paper is to investigate the real effects of primary and secondary equity markets on the post-issue operating performance of initial public offering (IPO) firms. This paper utilizes the intended use of proceeds as a proxy variable for the primary market and the investment-to-price sensitivity and the informativeness of stock prices as alternative proxy variables for the secondary market. The compositional data, and non-parametric quantile regressions which are more robust to outliers than standard least square regressions, are employed for Indonesian equity market over the period of 1999-2013. While confirming that firm operating performance can be explained by the firm's motivation to go public, this paper also shows that the operating performance is positively affected by investment-to-price sensitivity and negatively affected by stock price informativeness. The stock prices affect investment decisions by the way that the more liquid a stock is, the more informative its price is, and the more relevant stock prices are in investment decisions. These findings still hold after controlling for ownership structure.

1. INTRODUCTION

Andriansyah and Messinis (2014) investigate the role of primary and secondary equity markets in economic growth at macro-economic level. They find that the capital raising function of the primary market is not an important determinant of economic growth, while the liquidity function of the secondary market is. This study experiments with a similar framework at the micro-economic level. It utilises intended use of proceeds, as proxy variables for the primary market, used in Andriansyah and Messinis (2016). Instead of liquidity measure, this study proposes

two alternative proxy measures for the secondary market: that is, investment-to-price sensitivity which measures the degree of association between stock prices and real investment decisions, and informativeness of stock price which measures the amount of private information contained in stock prices. This study examines the impact of both these primary and secondary equity market variables on firm performance.

After an initial public offering (IPO) is completed and the shares of a public firm are traded on a stock exchange, there are no funds from the public other than the IPO proceeds that are available for investment activities of the firm. Andriansyah and Messinis (2016) show that intended use of proceeds explain post-issue operating performance. It provides evidence that investment in fixed assets indicates better performance in the post-issue era, which contrasts with other studies stating that such investment is not responsible for the decline in operating performance. Fixed asset investment is deemed an important determinant of firm growth as it affects the accumulation of capital that will be used to produce goods and services. That study however ignores what happens after the IPO. In order to maximize shareholder wealth, investment decisions must also be made after the IPO. Stock prices are one of the important considerations used by managers in an investment decision making process. In other words, managers can learn from stock prices.

Dow and Gorton (1997) argue that stock prices are a result of the aggregation of information possessed by many market participants which some of them may have additional information beyond those that listed firms have released to the public. A higher (lower) stock price in equity markets conveys additional positive (negative) information to the incentive driven managers about both investment opportunities and managers' past decisions. This market valuation is a feedback from the financial

market which informs investment decisions either to proceed, postpone or cancel a project; or alternatively, results in underinvestment or overinvestment (Blanchard *et al.* 1993; Stein 2003; Goldstein & Guembel 2008). According to Subrahmanyam and Titman (1999), a manager's main goal is to obtain this valuable information contained in stock prices, before they decide to go public. Foucault and Fresard (2012) hypothesize that this learning process improves firm capital allocation efficiency. Furthermore, they contend that a higher investment-to-price sensitivity leads to a better firm operating performance.

Existing studies on the investment-to-price sensitivity consistently show mixed and inconclusive results. For instance, Morck *et al.* (1990) contend that information in stock prices is not important for managers because market valuation has no additional information other than internal valuation. When stock prices do not fully reflect fundamentals, Blanchard *et al.* (1993) also assert that the role of market valuation is limited in affecting investment decisions. They argue that managers' response to market mispricing by issuing new shares is just a type of pure transfer from old shareholders to new shareholders. The proceeds from the issuance might also be used to buy riskless financial assets, not physical investment, in order to avoid the decrease in the capital's marginal product.

Baker and Wurgler (2002) and Baker *et al.* (2003) postulate the equity issuance or financing channel maintaining that managers tend to issue new shares when the market overprices their firm stocks and tend to repurchase outstanding shares when the market under-prices the stocks. Alternatively, Polk and Sapienza (2008) explain that managers may not necessarily respond to the market mispricing by issuing new shares, but rather by changing their investment policies. By catering to market

sentiment, listed firms may benefit from mispricing either by undertaking unprofitable investment projects when overpriced, or postponing profitable investments when under-priced. Furthermore, they reveal that investment in firms with higher R&D intensity and share turn-over are more sensitive to mispricing. Ovtchinnikov and McConnell (2009) find that both undervalued and overvalued firms might have the same sensitivity of investment to prices. Investment is significantly affected by both stock-price-based and non-stock-price-based measures of growth opportunities. However, according to these measures the relationship between investment and stock prices is actually from investment to stock prices, not the other way around.

Some studies in the U.S. market such as Chen *et al.* (2007) support the positive relationship between investment decisions and stock prices; while others such as Bakke and Whited (2010) suggest that there is no evidence of such relationship. When the prices are decomposed into those containing private information and those containing public information, both studies however confirm that private information – as a measure of price informativeness – plays a crucial role in a firm's investment decisions. Evidence for other markets also shows mixed results. Forster (2005) finds that stock prices in Germany may be positively related to investment but their effect is relatively minor due to its small coefficient value. Jiang *et al.* (2011) provide evidence in the international setting for investment sensitivity to stock prices through their study of 22 non-US markets. The study also finds that a more concentrated ownership creates less incentive for managers to learn from stock prices. Meanwhile in five Arabic markets, Bolbol and Omran (2005) show that stock prices have no impact on investment decisions.

Dependence of investment decisions on stock prices in turn depends on the informativeness of stock prices. Durnev *et al.* (2004) claim that more informative stock prices lead to more efficient investment allocation. Chen *et al.* (2007) contend that what managers learn from stock prices is actually the private information contained in the stock prices. They argue that stock prices contain both public and private information. What does matter for managers is the new private information revealed through speculators' trading activities. Empirical evidence from non-US markets is not consistent with this contention. Wang *et al.* (2009), Xiao (2009) and Kong *et al.* (2011), for instance, provide conflicting results for China. Wang *et al.* (2009) argues against the informativeness hypothesis, while Xiao (2009) and Kong *et al.* (2011) argue for it. Wang *et al.* (2009) asserts stock prices contain very little extra information regarding listed firms' future operating performance. Chinese market characteristics such as poor corporate governance practices, market manipulation and state-enterprises-dominated listed firms are responsible for this un-informativeness of stock prices (Wang *et al.* 2009). Xiao (2009), on the other hand, finds evidence that investment is (statistically) significantly affected by stock prices through Tobin *q*. Meanwhile, Kong *et al.* (2011) conclude that asymmetric information has a diminishing effect on the sensitivity of prices to investment. They find that aggregate prices as well as private information contained in stock prices are positively correlated with investment. They also provide evidence that investment may be positively or negatively related to stock prices. In a macro level study in Australia, Andersen and Subbaraman (1996) find that the fundamental component of stock prices plays a more significant role than the speculative component on investment decisions.

In a recent study, Asker *et al.* (2014) find that the impact of stock prices on investment decisions is also determined by the myopic behavior of managers. They argue that even though an IPO is aimed at raising capital for investment, post-listing investment decisions are distorted by short-term pressures. These pressures make managers less sensitive to changes in investment opportunities. Relative to private firms that are assumed to have lesser agency problems, Asker *et al.* (2014) also argue that this myopic behaviour causes public listed firms to avoid negative earnings surprises of investment decisions instead of exploiting positive investment opportunities. As a result, public firms may be more sensitive to stock prices.

In general, when stock prices contain useful information for managers and the information is used by managers in firm investment decision making process, equity markets are not a sideshow (Morck *et al*. 1990) and they do affect the real economic activity (Forster 2005; Bond *et al.* 2012). In other words, the secondary equity market through stock prices has real impact on economic activity. Forster (2005) argues that there are three direct transmission channels linking stock prices and the real economic activities: namely, *q*-channel, balance sheet channel, and consumption-wealth channel. Firstly, the *q*-channel, based on Brainard and Tobin (1968), proposes that a firm's incentive to invest can be measured by Tobin's *q*: that is, the ratio of stock price to the replacement cost of capital. If the price exceeds the cost (hence, the ratio is higher than one), then firms should invest because the cost of investing is relatively lower than the value of the capital. Romer (2006) demonstrates how the present value of profits from an additional dollar of the investment can be represented by the Tobin's *q*, which also reflects all future information about investment decisions. Secondly, the balance-sheet channel, applied for all economic

agents holding shares, conjectures that stock prices affect households' liquidity and their demand for durable goods and housing, as well as affects firms and banks' external financing costs. For firms in general, a change in stock price affects the value of their financial assets. A re-valuation of the financial assets leads to a re-valuation of collaterals, which is often based on some financial assets which, in turn, will affect the borrowing capacity of firms. At the same time, a change in assets of banks or other non-banking financial institutions will also affect their lending capacities. In short, stock prices of listed firms will also affect investment of non-listed firms and banks due to their influence on both borrowing and lending capacities. Finally, consumption-wealth channel holds that price changes influence households' financial wealth and their current and future consumption.

By assuming the informational role of prices, Bond *et al.* (2012) proposes three different channels: namely, managerial learning channel, price-based incentive channel, and irrational price anchoring channel. Managerial learning channel states that stock prices affect managers' decisions. Price-based incentive channel argues that prices reflect managers' decisions. A management incentive scheme dictates that managers are paid according to stock prices; therefore, they will make decisions that boost stock prices. Irrational price anchoring channel is similar to managerial learning channel except that managers anchor stock prices for their actions irrespective of whether stock prices reflect changes in the fundamentals or not. Managers may make irrational decisions due to their overreaction to stock price changes. This study mainly relates to either the q-channel or the managerial learning channel: that is, managers learn from stock prices by observing Tobin's q.

The studies on the investment-to-price sensitivity and the stock price informativeness discussed above have been conducted in isolation from firm performance. This study argues that in addition capital-raising in the primary market, public firms would also benefit from the informational role of stock prices in the secondary market. According to Bond *et al.* (2012), both markets interact closely in reality. This study provides a single framework for examining the role of both markets on firm performance.

The rest of this paper is organized as follows. Section 2 explains methodologies used to measure investment-to-price sensitivity and stock price informativeness. Section 3 presents the empirical model used to investigate the impact of the primary market and the secondary market on firm performance, as well as describes data. Section 4 presents and discusses the main empirical results. Lastly, Section 5 concludes.

2. METHODOLOGY

2.1. The Investment-to-price sensitivity

This study departs from standard literature in the measurement of investment-to-price sensitivity. Typical studies measure the investment-to-price sensitivity at country level because audited financial statements needed to compute firm investment and Tobin q are published annually. This study follows the approach of Asker *et al.* (2014) to calculate the investment-to-price sensitivity by estimating the sensitivity over a period of time. The study chooses the time period according to the period of cumulative change in an operating performance indicator. The investment-to-price sensitivity (*SENS*) is an ordinary least squares (OLS) estimate of γ_1, that is

$\hat{\gamma}_1$, of a basic of Tobin's q theory of investment model (Brainard & Tobin 1968)[1] as follows:

$$\frac{I_{i,t}}{K_{i,t-1}} = \gamma_0 + \gamma_1 Q_{i,t} + \epsilon_{i,t} \quad (1)$$

where $I_{i,t}$ is the change in total net fixed assets or property, plant and equipment (PPE) of firm *i* at time *t*,[2] $K_{i,t}$ is capital stock of firm *i* at time *t*, and $Q_{i,t}$ is Tobin q of firm *i* at time *t* measured by the ratio of the market value of equity plus book value of debt to book value of total assets. The main issue with this metric is that we need at least two years data for a regression with one independent variable and one dependent variable. The use of other variables that are commonly used as control variables in empirical q model of investment such as volatility, sales, leverage, cash flow, last year book assets, future returns, and firm size (Baker *et al.* 2003; Chen *et al.* 2007; Kong *et al.* 2011; Tran 2014) are avoided because they require more observations.

The interest of this study is in estimating the γ_1 parameter of model (1). Annual data is used for a period of four to six years. Investment-to-price sensitivity is estimated for a firm *i* over the three-year period, four-year period and five-year period after the IPO year (i.e. $SENS_{i,0+T}$ where $T = 3, 4, 5$).

[1] This model has also been used in many studies on the sensitivity of investment to various variables of interest in Indonesia context such as financing constraints (Prasetyantoko 2006) and liberalization on manufacturing firms (Harris *et al.* 1994).

[2] Alternatively, one can also use gross PPE, capital expenditure (CAPEX), or the percentage change in book assets. This study use the net investment main because this variable is the most complete data available.

2.2. The Stock Price Informativeness

The stock price informativeness of a firm over the period of *t* years after IPO, $INFO_{i,0+t}$, is measured by $1 - R^2$ where R^2 is the coefficient of determination of the following OLS regression:[3]

$$r_{i,j,t} = \beta_{i,0} + \beta_{i,m} r_{m,t} + \beta_{i,j} r_{j,t} + \varepsilon_{i,j,t} \quad (2)$$

where, $r_{i,j,t}$ is daily return of firm *i* in industry *j* at time *t*, $r_{m,t}$ is daily market return (i.e. Jakarta composite Index JCI) at time *t*, $r_{j,t}$ is daily return of industry index *j* at time *t*. The stock price informativeness is calculated over the period *T* year after the IPO, where $T = 3, 4, 5$. The daily return is a continuously compounded one and calculated using the following formula:

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right) \quad (3)$$

where P_t is price or index at time *t* and $\ln(\cdot)$ is the natural logarithm function.

The standard interpretation of a higher private informativeness of stock prices (a lower R^2 or a higher $1 - R^2$) reflects a higher asymmetric information measures, a higher price non-synchronization, but better quality of the information environment, and is expected to lead to more efficient investment. However, there are two alternative explanations for a higher $1 - R^2$. Firstly, Dasgupta *et al.* (2010) agree that a higher $1 - R^2$ may be due a higher firm-specific information, and therefore

[3] Lai *et al.* (2014) provide evidence against the use of the probability of information-based trading (PIN) as an alternative measurement of stock price informativeness by showing that there is no positive relation between PIN and expected stock returns.

represent a higher stock price informativeness. However, this lower return synchronicity can also indicate that the information environment is less transparent. They maintain that lower transparency in a firm's operations cannot supply enough information to investors who in turn are not able to incorporate the information into the stock prices. The investors then tend to be uninformed traders. A corporate announcement will contain significant additional announcements that in turn make stock prices to adjust significantly. Secondly, an occasional frenzy unrelated to concrete information (Roll (1988) and trading activities conducted by noise traders (Blacks 1986) can make stock prices jump.

This paper offers another explanation that higher $1 - R^2$ may be due to thin trading (lower trading volume). Consider that R^2 or $1 - R^2$can be expressed as

$$R^2 = 1 - \frac{\sum(r_{i,j,t} - \hat{r}_{i,j,t})^2}{\sum(r_{i,j,0+t} - \bar{r}_{i,j,t})^2} \quad (4)$$

$$1 - R^2 = \frac{\sum(r_{i,j,0+t} - \hat{r}_{i,j,t})^2}{\sum(r_{i,j,0+t} - \bar{r}_{i,j,t})^2} \quad (5)$$

where $\sum(r_{i,j,0+t} - \hat{r}_{i,j,0+t})^2$ is the sum of squares of residuals (SSR); $\sum(r_{i,j,0+t} - \bar{r}_{i,j,0+t})^2$ is the total sum of squares (SST); $\hat{r}_{i,j,t}$ is the predicted return for values of $r_{j,t}$; and $\bar{r}_{i,j,t}$ is the mean of $r_{i,j,t}$. SST is proportional to the variance of the daily stock returns, $VAR(r_{i,j,0+t})$. If the firm stock is thinly traded, the stock price most likely will not change significantly. Therefore, $VAR(r_{i,j,0+t})$ will be small. This in turn leads to a lower R^2 in Equation (4) or a higher $1 - R^2$ in Equation (5).

Little investor interest in stock trading, in particular that of a lesser known firm, leads to thin trading which in turn makes the stock price remain relatively unchanged. The stock price may only change in response to public information having been released by the firm. This change in the stock price, however, does not contain new additional information that can be learned by managers. Also, little analyst coverage contributes to thin trading. Derrien and KecskÉS (2013) show that analyst coverage positively correlates with investment decisions.

3. MODEL SPECIFICATION AND DATA

3.1. Model Specification

Equity markets, either the primary market or the secondary market, contribute to firm performance. The primary market performs the capital-raising function, while the secondary market performs the informational role of stock prices. This relationship can be expressed as follows:

$$performance = f(\text{the primary market, the secondary market, other determinants}) \quad (6)$$

The primary market provides new capital through a public offering; while the secondary market provides information to estimate investment-to-price sensitivity and price informativeness. Appendix A graphically illustrates these roles in a time line. We expand the firm operating performance model in Andriansyah and Messinis (2016) by including secondary market variables. The baseline empirical model tested is therefore as follows:

$$Performance_{i,0+T} = \beta_0 + \beta_1 FA_{i,0} + \beta_2 WC_{i,0} + \beta_3 SHARES_{i,0} + \beta_4 DEBT_{i,0} + \beta_5 DISINVT_{i,0} + \beta_6 SENS_{i,0+T} + \beta_7 INFO_{i,0+T} + \beta_8 (SENS_{i,0+T} \times INFO_{i,0+T}) + \boldsymbol{\gamma}' \boldsymbol{Z}_{i,0} + \varepsilon_{i,0+T} \quad (7)$$

where *i* indicates firm, *t* indicates a point of time, *T* indicates the end of period of time, and 0+*T* indicates a period over 0 to *T*. The dependent variable $Performance_{i,0+T}$ is defined as the cumulative change in an operating performance measure (i.e. operating profit scaled by total assets (*EBIT/TA*), net income scaled by total assets (*NI/TA*), and net sales scaled by total assets (*Sales/TA*)) as well as the number of employees (*EMPL*) from the IPO year to *T* years after IPO (*t* = 0 to T = 3, 4, and 5, for simplicity this will be denoted by +3, +4, and +5). These operating performance measures are used for comparison with previous literature, as in Jain and Kini (1994), Loughran and Ritter (1997), and Autore *et al.* (2009). To control for a management bias in the timing of IPOs, the adjusted-industry operating performance is also calculated by subtracting median industry operating performance from firm operating performance. This study does not use the operating performance of similar and comparable private firms to benchmark against that of issuers (such as in such as in Jain and Kini (1994) and Pagano *et al.* (1998)) due to limited data availability on private firms in Indonesia. Instead, this study compares the evolution of operating performance of the same firms before and after the issuing year. Therefore, the decline in operating performance of a firm after the IPO year is relative to the performance of its own at the IPO year. The study, however,

benchmarks listed firms belonging to the same industry at the same year such as also used in Kim *et al.* (2004), Wang (2005), and Autore *et al.* (2009).

One of the independent variables is the proportion of the proceeds that firm *i* received in the IPO year ($t = 0$) and allocated to five different usages: namely, fixed asset investment ($FA_{i,0}$), working capital financing ($WC_{i,0}$), investment in shares of stock ($SHARES_{i,0}$), debt repayment ($DEBT_{i,0}$), and disinvestment ($DISINVT_{i,0}$). These variables are used as proxy for primary market variables and are defined as in Table 1. Meanwhile, $SENS_{i,0+T}$ is investment-to-price sensitivity for firm *i* over period *T* years after IPO and $INFO_{i,0+t}$ is the stock price informativeness of a firm for firm *i* over period *T* years after IPO. The control variables $\boldsymbol{Z}_{i,0}$ are total proceeds scaled by total assets ($PROCEEDS_{i,0}$), firm size measured by the natural logarithm of the total assets ($SIZE_{i,0}$), leverage measured by the debts scaled by total equities ($LEVR_{i,0}$), and firm age measured by the number of years from its establishment date to its effective statement date ($AGE_{i,0}$). The control variables are also used in Rajan and Zingales (1995), Mikkelson *et al.* (1997), Wang (2005), Carpenter and Rondi (2006), and Autore *et al.* (2009). These variables are measured at the start of each IPO year, not at a year prior to the IPO, and include industry dummies and year dummies to control the impact of different industries and years. The industry classification is based on the Jakarta Industrial Classification of the Indonesia Stock Exchange (IDX).

Equation (7) is estimated by the non-parametric quantile regressions using the alternative Epanechnikov kernel function and the Chamberlain's bandwidth. As in Autore *et al.* (2009) and Barber and Lyon (1996), this estimation method is chosen because it is more robust to outliers than standard OLS regressions. In this study,

three different values of p or quantile are used: namely, 25th percentile, 50th percentile (or the median), and 75th percentile of the conditional distribution. The lower (higher) quantile represents low (high) performing firms where the cumulative change is lower (higher) than the median of conditional distributions.

3.2. Data

The sample is non-financial public listed firms having received an effective statement from the Indonesian securities authority over the period 2000-2010. However, because investment-to-price sensitivity measure requires data of at least three years after the IPO year, two firms which received effective statement at the end of the year 2010 and are listed on IDX in 2011 are excluded because the last financial statement data available from *Thomson Reuters* fundamentals is for the year 2013. Furthermore, one firm which had no data for the study period of 1999-2013 was excluded. The final sample consists of 138 firms. Individual stock prices, nine Jakarta sectoral indices and the Jakarta composite index data are collected from *Datastream Professional* database. Table 1 presents the variable definitions used in this study.

INSERT TABLE 1 ABOUT HERE

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

The Cumulative Change in Operating Performances

INSERT TABLE 2 ABOUT HERE

Table 2 shows that three to five years after the IPO year, both *EBIT*/*TA* and *NI*/*TA* decline, while *Sales*/*TA* and *EMPL* increase. Panel A, for example, exhibits that the mean ratio operating profit to total assets at the end of year 3 (*EBIT*/*TA* +3) has cumulatively decreased by 3.6% since the IPO year. A year later (+4) the cumulative change in this operating performance remains the same, but two years later (+5) the cumulative change reduces to -3.0%. This decreasing post-issue performance is also shown by *NI*/TA (Panel B). The median cumulative change in the ratio net income to total assets, however, shows a different pattern. For instance, at the end of year 5 and year 3, mean *NI*/*TA* has declined by 3.8% and 4.4%, respectively. Median *NI*/*TA*, on the other hand, experiences a higher decline at the end of year 5 compared to the end of year 3 (*NI*/*TA* +3 = -0.024 vs. *NI*/*TA* +5 = -0.028). Both industry-adjusted *EBIT*/*TA* and *NI*/*TA* also have a similar pattern with the unadjusted figures (Panel E and Panel F).

Sales/*TA* increases over the period three to five years after IPO (see Panel C and Panel G). The mean cumulative change in sales to total assets ratio increases by 5.2% at the end of year 3. A year later the cumulative change is still positive but at a lower level of 3.7%. The cumulative increase in *Sales*/*TA* at the end of year 5 is much higher than that at the end of year 3. The increase rate over this five years period, however, is lower when this study uses industry-adjusted value of *Sales*/*TA* as shown in Panel G. A different pattern is prevalent if median cumulative changes are used rather than the mean changes. The median unadjusted *Sales*/*TA* still shows an increase of 1.2% in the third year, but it shows a decrease of 1.1% in the fifth

year. Meanwhile, the median adjusted *Sales*/*TA* declines by 0.2% and 1.8% at the end of year 3 and year 5, respectively. This indicator then increases in year 5.

Employment consistently shows an increase in all periods. The mean (median) additional number of employees at the end of year 3 is 263 (306) persons. The mean (median) increases to 324 (348) persons and 492 (493) persons at the end of year 4 and year 5, respectively.

To sum up, there is a decline in the post-issue *EBIT*/*TA* and *NI*/*TA* of IPO firms, while there is an increase in *Sales*/*TA* and the number of employees over the period from three to five years after IPO year. These findings are similar to those in Andriansyah and Messinis (2016) when the cumulative changes are measured from a year before the IPO year.

The Sensitivity of Investment to Stock Prices and the Private Informativeness of Stock Prices

Table 3 summarizes the investment-to-price sensitivity statistics and the stock price informativeness. Panel A shows that the sensitivity can be positive or negative. A positive (negative) sensitivity means that Tobin's *q* positively (negatively) affects investment: that is, a higher stock price leads to a higher (lower) investment.

INSERT TABLE 3 ABOUT HERE

At the first glance, it seems that the longer the firm shares have been listed and traded on a stock exchange, the greater the negative effects of stock prices on firm investment. However, this is observed only when mean values are used. When median values are used, the results show that the sensitivity of investment to stock prices is always positive. Further investigation reveals that the data contains outliers producing the negative means. For instance, the minimum value for *SENS* +5 is -10.241, while the mean and median are -0.122 and 0.005 respectively. A 95% or 90% winsorization (i.e., deleting outliers) of the data leads to a positive sensitivity of investment to stock prices for all time periods. A 95% winsorization *SENS* +5, for instance, produces a mean value of 0.015. It is safe to conclude that the sensitivity of investment to stock prices in this study is positive and this positive correlation is as expected according to the Tobin *q* theory of investment. It is worth noting here that statistical significance of the sensitivity is not used as an important indicator due to the very small year observation used in the construction of the sensitivity measure. The impact of outliers has also been considered in using quantile regressions as proposed in the methodology section.

The results above are similar to the empirical evidence found in other studies. Asker *et al.* (2014) provide evidence that public firms' investments are less sensitive to changes in stock prices than private firms due to short-term pressures in the latter. The US public firms' investment-to-price sensitivity coefficients are between -0.014 to 0.124. These figures are 4.4 times lower than those of private firms. Chen *et al.* (2007) find a higher sensitivity within the range of 1.08 to 20.26, depending upon the proxy variable used for investment. In China, Kong *et al.* (2011) find that the minimum and maximum sensitivity values are -0.0137 and 0.0692, respectively.

Meanwhile, in Arab countries the coefficients are in the range of -0.07 to 0.06 (Bolbol & Omran 2005).

Panel B of Table 3 shows that private informativeness of stock prices is stable within the range of 0.85-0.90 up to five years after IPO year. For example, the mean (median) price non-synchronization over the period 3 years after IPO (*INFO* +3) is 0.884 (0.988), reflecting substantially higher firm-specific return variation. A longer sample period increases the variation, but the change is insignificant. At the end of year 4 and year 5, the mean (median) stock price informativeness has only increased to 0.887 (0.987) and 0.898 (0.959), respectively.

This relatively higher $1 - R^2$ (lower R^2) indicates higher stock price informativeness which in turn indicates higher firm specific informativeness. The quality of information environment may be deemed good because the cost of getting information is relatively low. This seems counterintuitive and can be challenged. Information environment in developed markets such as the U.S.A is much better than Indonesia; but their asymmetric information measures are even lower than Indonesia. For example, Dasgupta *et al.* (2010) find that mean (median) $1 - R^2$ in the U.S.A is 0.87 (0.918), relatively similar to those found by Chen *et al.* (2007) with mean (median) of 0.83 (0.92). The Indonesian market may be similar to the Chinese market. Kong *et al.* (2011) find that an asymmetric information measure in China is between 0.111 and 0.997, with a mean (median) of 0.550 (0.554). In general, total trading value in Indonesia's equity market is still relatively low compared to the rest of the emerging markets. In terms of trading turnover, Indonesia was still below Vietnam and Thailand. Indonesia's market turnover was 48.1%t, while Vietnam and Thailand were 141.4% and 104.8%, respectively. Indonesia is a French-civil-law

country with the weakest legal protections to shareholders and creditors, the poorest law enforcement and the lowest quality of accounting standards (la Porta *et al.* 1998),. Therefore the higher $1 - R^2$ may indicate thin trading as shown by Panel C and Panel D of Table 3.

Panel C shows that the variance of stock returns is relatively small which implies that stock prices do not change significantly. The variance is higher in the first year of trading, then stable until the end of year 5. This pattern also is visible in terms of average daily trading volume presented in Panel D. On average, the trading volume is about 26 million shares a day in the IPO year. However, the number of shares traded daily decrease significantly after that. The higher liquidity during the first year of listing may be related to the initial underpricing phenomena. Andriansyah and Messinis (2016) finds that the stock price of sample firms increases by 35% on the first trading day which attracts investors' attention to every new issues on the stock exchanges.

We also use another measure of liquidity if a stock firm has ever been included in the LQ45 index. The index is a market capitalization-weighted index that represents the performance of 45 most liquid firms listed on the IDX. Some of the criteria used to include a firm in the index include the stocks being in the top 60 highest transaction value in a regular market in the last 12 months, and the stocks having healthy financial conditions, prospects of growth, high trading frequency and transactions in the regular market. Over the period of three years after IPO, Figure 1 and Figure 2 confirm that stock price informativeness and variance of stock returns are affected by the stock's level of liquidity. Left panel in Figure 1 shows that firms that have their stocks included in LQ45 index will have a lower $1 - R^2$ than those

not included. The median $1 - R^2$ for LQ45 members is 0.715, while the median for non LQ45 member is 0.970. Right panel in Figure 1 also displays that non LQ45 members have a higher stock return variance than the members. The median *VAR* for LQ45 members is 0.0010, while median for non LQ45 members is 0.0014. Meanwhile, Figure 2 show that a more liquid stock leads to a lower $1 - R^2$ and a lower stock return variance, respectively.

Our sample also show that the differences in firm characteristics which may also partly explain the differences in stock price informativeness. It shows that firm size, firm age and public ownership correlate with investment-to-price sensitivity. The larger, the older, and the more diverse a firm is, the higher the stock price informativeness. On the other hand, a correlation between firm characteristics and investment-to-price sensitivity may not exist.

4.2. Empirical Results

More details and a formal examination of the effects of primary and secondary equity markets on firm operating performance are presented in Tables 4-7. Effects on low performing firms (25% quantile), average performing firms (50% quantile), and high performing firms (75% quantile) are examined. The estimations are based on Model (7) which includes control variables, industry dummies and year dummies. This study analyses the effects on the cumulative change in the industry-adjusted operating performance for the three years period after IPO.[4] Therefore, all ratios discussed below refer to those of industry-adjusted figures, expect for the number of employment.

[4] Similar findings can be found if the effects of secondary markets on firm performance and employment are examined over four and five year periods after IPO. The results are available upon request.

INSERT TABLE 4 ABOUT HERE

INSERT TABLE 5 ABOUT HERE

INSERT TABLE 6 ABOUT HERE

INSERT TABLE 7 ABOUT HERE

Table 4 indicates that investment-to-price sensitivity can only explain *EBIT*/*TA* for low performing firms, while stock price informativeness in general has no explanatory power in explaining the decline in post-issue *EBIT*/*TA*. The main effect of investment-to-price sensitivity for low performing firms is statistically significant at 1% level. A higher sensitivity leads to higher operating profit for low performing firms. The effect of investment-to-price sensitivity on firm performance however depends on the level of stock price informativeness, which is indicated by the significance of the interaction term between both variables. The interaction term shows that the positive impact of investment-to-price sensitivity on firm performance is higher when stock price informativeness is high.

In terms of intended use of proceeds, the cumulative change in *EBIT*/*TA* for low and average performing firms over the three years period after the IPO year is positively affected by fixed asset investment. This finding is similar to that in Andriansyah and Messinis (2016) which uses the cumulative change in *EBIT*/*TA* over the period from a year before IPO to two years after IPO. Debt repayment negatively affects *EBIT*/*TA* for all firms, which is contrary to the finding in Andriansyah and Messinis (2016) where it affects only average performing firms.

For low performing firms, a higher allocation to working capital financing and investment in shares of stock also leads to an increase in operating profit.

Table 5 presents quantile regression estimates for industry-adjusted net income per total assets. Results show that both investment-to-price sensitivity and stock price informativeness do not affect net income. None of these secondary market measures are statistically significant, neither is their interaction. Similar to *EBIT*/*TA,* debt repayment has a negative impact on *NI*/*TA* for all firms. Fixed asset investment, on the other hand, has a positive impact for average performing firms and high performing firms.

Table 6 provides evidence that stock price informativeness has explanatory power in explaining the variation in cumulative change of net sales. A higher $1 - R^2$ causes a decline in *Sales*/*TA* only for low performing firms and average performing firms. Net sales are also found to be negatively affected by working capital financing. In this study, the negative effect is significant for all firms, not only for low performing firms.

Table 7 shows similar findings to those presented in Table 8 where investment-to-price sensitivity and the interaction between investment-to-price sensitivity and stock price informativeness affect employment. However, the impact of both variables is different. A higher investment-to-price sensitivity leads to a decline in employment after going public while a higher interaction between investment-to-price sensitivity and stock price informativeness leads to an increase in employment.

Over all, this study finds that the secondary equity markets through investment-to-price sensitivity and stock price informativeness can explain firm performance, particularly the low performing firms and average performing firms. Investment-to-

price sensitivity positively affects firm performance while stock price informativeness negatively affects firm performance. The effects are more prevalent in stocks that have been trading on a stock exchange for a longer period: that is, four to five years since listing on the exchange. However, this study argues that a higher stock price informativeness found in the Indonesian equity market is related to thin trading rather than private information. In other words, the level of liquidity affects the level of informativeness. The more liquid a stock is, the more informative its price will be, and thus the more relevant stock prices will be in investment decisions. In terms of intended use of proceeds, this study confirms that the difference in intended use of IPO proceeds can explain the variation in three different measures of operating performance and employment. An intention to allocate more proportion of IPO proceeds to fixed asset investment leads to an improved operating performance. In addition, all control variables have a significant explanatory power. To conclude, both the primary market and the secondary market have impacts on firm performance and employment.

4.3. Robustness Tests

This study further assesses the robustness of the model by controlling for ownership structure. A quadratic relationship between initial ownerships (*Initial*) and operating performance or employment are studied. Appendices B to E present the estimates. Controlling for ownership structure makes the relationships between investment-to-price sensitivity, stock price informativeness, and firm performance even stronger. For instance, Appendix B shows that the positive impact of

investment-to-price sensitivity on operating profit is also discernible in average performing and low performing firms.

5. CONCLUSION

Departing from the existing literature; this study investigates the role of primary and secondary equity markets for firm performance and employment in an integrated framework. The study argues that public listed firms can benefit both from the capital-raising function of the primary market and from the informational role of stock prices of the secondary market, including how stock prices affect investment decisions.

Using a dataset of 138 Indonesian non-finance firms over the period of 1999-2013, this study finds that both markets play significant role in determining post-issue firm operating performance. While confirming that the intended use of IPO matters for three different measures of operating performance, firm performance is also found to be positively affected by investment-to-price sensitivity and negatively affected by stock price informativeness. This study, however, argues that, as a measure of stock price informativeness $1 - R^2$ must be understood in the context of thin trading in the sense that the level of liquidity affects the level of stock price informativeness. The more liquid a stock is, the more informative its price is, and the more relevant stock prices are in investment decisions.

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Table 1. Variables Definition

Variables	Source	Definition
Panel A. Firm Performance		
EBIT/TA	SOPI/ATOT	Operating profit (total revenue minus total operating expenses) scaled by total assets
NI/TA	NINC/ATOT	Net income scaled by total assets
Sales/TA	SREV/ATOT	Net sales scaled by total assets
EMPL	METL	Total number of full-time employees
Panel B. Primary Market		
FA	Own calculation	Fixed assets investment (investment in non-current assets)
WC	Own calculation	Working capital financing (investment in current assets)
SHARES	Own calculation	Investment in shares of stock (capital contribution to the firm's subsidiaries and other firms)
DEBT	Own calculation	Debt repayment (spending for paying principal debt balance)
DISINT	Own calculation	Disinvestment (shares sold by initial owners)
Panel C. Secondary Market		
I	APPN	Net property, plant & equipment (PPE)
Q	(*MVE*+*BVD*)/ATOT	Tobin *q* (the ratio between market value of the firm and its replacement costs)
K	ATOT	Total assets
MVE	QTCO*UP	Market value of equity (total common shares outstanding times the year end stock price)
BVD	ATOT-SCMS	Book value of debt (total assets minus common equity)
Stock prices	P	Closing stock prices
Sectoral indices	JAKAGRI	Agriculture
	JAKBIND	Basic industry and chemicals
	JAKPROP	Property and real estate
	JAKCGDS	Consumer goods industry
	JAKMINE	Mining
	JAKMISC	Miscellaneous industry
	JAKTRAD	Trade, service and investments
	JAKINFR	Infrastructure, utilities and transportation
JCI	JCI	Closing Jakarta composite index
Panel D. Controls		
AGE	Own calculation	The number of years from its establishment date to its effective statement date
SIZE	ATOT	Logarithm of the total assets
PROCEEDS	Own calculation	Total proceeds scaled by total assets
LEVR	STLD/ (ATOT-LTLL)	Total debt scaled by total equity

Notes: The main sources of data are prospectuses and *Thomson Reuters* fundamentals. Data from the fundamentals is used according to the four letters of chart of account and its definition related to the variable therefore is based on Reuters (2013).

Table 2. Descriptive Statistics of the Cumulative Change in Firm Performance

Performance	N	Mean	St.dev	Min	Q1	Median	Q3	Max
Panel A. *EBIT/TA*								
+3	137	-0.036	0.162	-1.115	-0.071	-0.026	0.019	0.758
+4	115	-0.036	0.132	-0.815	-0.080	-0.025	0.020	0.318
+5	105	-0.030	0.113	-0.381	-0.083	-0.021	0.025	0.326
Panel B. *NI/TA*								
+3	137	-0.044	0.158	-0.937	-0.066	-0.024	0.004	0.613
+4	115	-0.043	0.125	-0.674	-0.079	-0.028	0.023	0.274
+5	105	-0.038	0.102	-0.360	-0.084	-0.028	0.014	0.298
Panel C. *Sales/TA*								
+3	137	0.052	0.435	-1.896	-0.125	0.012	0.137	2.534
+4	115	0.037	0.480	-1.723	-0.139	-0.007	0.220	2.671
+5	105	0.063	0.451	-1.562	-0.119	-0.011	0.260	1.676
Panel D. *EMPL*								
+3	126	263.206	865.343	-1,894	-26	60	306	6,626
+4	111	324.045	1,752.621	-9,444	-40	71	348	11,421
+5	94	492.245	2,169.495	-9,391	-51	63	493	15,336
Panel E. *Adjusted EBIT/TA*								
+3	137	-0.038	0.162	-1.130	-0.075	-0.035	0.013	0.730
+4	115	-0.042	0.135	-0.838	-0.079	-0.030	0.016	0.349
+5	105	-0.035	0.114	-0.421	-0.079	-0.036	0.018	0.318
Panel F. *Adjusted NI/TA*								
+3	137	-0.048	0.160	-0.954	-0.072	-0.026	0.000	0.612
+4	115	-0.048	0.128	-0.757	-0.086	-0.031	0.007	0.269
+5	105	-0.044	0.103	-0.354	-0.090	-0.029	0.003	0.300
Panel G. *Adjusted Sales/TA*								
+3	137	0.053	0.440	-1.753	-0.132	-0.002	0.209	2.478
+4	115	0.017	0.481	-1.592	-0.176	-0.018	0.172	2.576
+5	105	0.035	0.461	-1.583	-0.169	0.007	0.238	1.777

Notes: *EBIT*/*TA, NI/TA,* and *Sales/TA* stand for operating profit, net income, and net sales, all scaled by total assets. *EMPL* is the number of employments. +3, +4, and +5 are the cumulative change in the corresponding operating performance measure over the period three, four, and five years after the IPO year, respectively. The adjusted figures are calculated by subtracting median industry operating performance from firm operating performance.

Table 3. Descriptive Statistics of Investment-to-Price Sensitivity, Stock Price Informativeness, Variance of Stock Returns and Trading Volume

Variable	N	Mean	St.dev.	Min	Q1	Median	Q3	Max
Panel A. Investment-to-price sensitivity								
+3	137	0.246	3.267	-2.979	-0.090	0.004	0.133	37.570
+4	115	-0.045	0.600	-3.232	-0.090	0.009	0.120	1.452
+5	104	-0.122	1.201	-10.241	-0.107	0.005	0.125	2.152
Panel B. Stock price informativeness								
+0	125	0.853	0.154	0.198	0.793	0.902	0.973	1.000
+1	140	0.860	0.158	0.360	0.787	0.917	0.984	1.000
+2	140	0.877	0.146	0.389	0.835	0.934	0.986	0.999
+3	140	0.884	0.143	0.393	0.847	0.951	0.988	1.000
+4	138	0.887	0.144	0.390	0.852	0.949	0.987	1.000
+5	117	0.898	0.139	0.419	0.870	0.959	0.988	1.000
Panel C. Variance of Stock Returns								
+0	139	0.0024	0.0034	0.0000	0.0007	0.0013	0.0028	0.0249
+1	140	0.0021	0.0025	0.0000	0.0008	0.0013	0.0024	0.0199
+2	139	0.0020	0.0022	0.0000	0.0008	0.0013	0.0023	0.0135
+3	137	0.0020	0.0023	0.0000	0.0009	0.0013	0.0021	0.0131
+4	116	0.0021	0.0024	0.0000	0.0009	0.0013	0.0024	0.0134
+5	106	0.0022	0.0023	0.0001	0.0009	0.0013	0.0023	0.0126
Panel D. Trading Volume								
+0	135	25.788	43.672	0.029	2.538	9.653	24.756	270.000
+1	135	11.569	18.657	0.014	1.436	4.131	12.303	110.000
+2	136	11.615	24.357	0.011	1.292	3.477	12.957	230.000
+3	135	13.056	28.991	0.008	1.204	3.826	13.608	190.000
+4	114	12.371	29.766	0.122	1.259	2.940	11.233	190.000
+5	104	12.762	28.339	0.108	1.272	2.769	11.273	160.000

Notes: +0 and +1, +2, +3, +4, +5 are the stock price informativeness (*SENS*), the investment-to-price sensitivity (*INFO*), variance of stock returns (VAT) and Trading volume in the IPO year and over the period one, two, three, four, and five years after the IPO year, respectively.

Table 4. EBIT/TA, Intended Use of Proceeds, Investment-to-price Sensitivity and Stock Price Informativeness: Quantile Regressions

	25% Quantile (1)	50% Quantile (2)	75% Quantile (3)
Constant	-0.2118**	-0.0838	-0.1376
	(0.0980)	(0.0753)	(0.1055)
Fixed asset investment	0.0007*	0.0008***	0.0005
	(0.0004)	(0.0003)	(0.0004)
Working capital financing	0.0008*	-0.0000	-0.0006
	(0.0004)	(0.0003)	(0.0005)
Investment in shares of stock	0.0008**	0.0004	0.0005
	(0.0003)	(0.0002)	(0.0004)
Debt repayment	-0.0014***	-0.0010***	-0.0009**
	(0.0003)	(0.0003)	(0.0004)
Disinvestment	-0.0008	-0.0002	0.0005
	(0.0005)	(0.0004)	(0.0006)
Stock price informativeness	0.0302	0.0014	0.0274
	(0.0456)	(0.0351)	(0.0492)
Investment-to-price sensitivity	0.2866***	0.1110	0.0602
	(0.0884)	(0.0679)	(0.0952)
$SENS \times INFO$	-0.2878***	-0.1131	-0.0640
	(0.0895)	(0.0688)	(0.0964)
Total proceeds	-0.1008***	0.0102	0.0153
	(0.0331)	(0.0254)	(0.0357)
Firm size	0.0225**	0.0091	0.0156
	(0.0102)	(0.0079)	(0.0110)
Leverage	0.0017	0.0136*	0.0102
	(0.0098)	(0.0075)	(0.0106)
Firm age	0.0007**	0.0007**	0.0003
	(0.0003)	(0.0003)	(0.0004)
Initial condition	0.1254**	0.1114***	0.0334
	(0.0538)	(0.0413)	(0.0579)
Observations	137	137	137
Pseudo-R^2	0.162	0.123	0.160

Notes: the dependent variable is the cumulative change in industry-adjusted *EBIT/TA* over the period three years after the IPO year. The estimation is using alternative Epanechnikov kernel function and Chamberlain's bandwidth. Significance at 1%, 5%, and 10% levels (two-sided) are denoted by ***, **, and *, respectively.

Table 5. NI/TA, Intended Use of Proceeds, Investment-to-price Sensitivity and Stock Price Informativeness: Quantile Regressions

	25% Quantile (1)	50% Quantile (2)	75% Quantile (3)
Constant	-0.0080	-0.1444**	-0.1135
	(0.0977)	(0.0684)	(0.0817)
Fixed asset investment	0.0004	0.0007***	0.0012***
	(0.0004)	(0.0003)	(0.0003)
Working capital financing	0.0006	0.0001	0.0000
	(0.0004)	(0.0003)	(0.0004)
Investment in shares of stock	-0.0000	0.0001	-0.0001
	(0.0003)	(0.0002)	(0.0003)
Debt repayment	-0.0007**	-0.0009***	-0.0009***
	(0.0003)	(0.0002)	(0.0003)
Disinvestment	-0.0003	-0.0001	-0.0002
	(0.0005)	(0.0004)	(0.0004)
Stock price informativeness	-0.0461	0.0200	0.0362
	(0.0456)	(0.0319)	(0.0381)
Investment-to-price sensitivity	0.1222	0.0793	0.0012
	(0.0894)	(0.0626)	(0.0748)
$SENS \times INFO$	-0.1228	-0.0816	-0.0050
	(0.0905)	(0.0634)	(0.0757)
Total proceeds	-0.0532	0.0791***	0.0963***
	(0.0330)	(0.0231)	(0.0276)
Firm size	-0.0005	0.0121*	0.0102
	(0.0102)	(0.0072)	(0.0085)
Leverage	0.0106	0.0041	0.0137*
	(0.0097)	(0.0068)	(0.0081)
Firm age	0.0004	0.0009***	0.0004
	(0.0003)	(0.0002)	(0.0003)
Initial condition	0.0131	0.0962*	0.1313**
	(0.0694)	(0.0486)	(0.0581)
Observations	137	137	137
Pseudo-R^2	0.134	0.125	0.172

Notes: the dependent variable is the cumulative change in industry-adjusted *NI*/*TA* over the period three years after the IPO year. The estimation is using alternative Epanechnikov kernel function and Chamberlain's bandwidth. Significance at 1%, 5%, and 10% levels (two-sided) are denoted by ***, **, and *, respectively.

Table 6. Sales/TA, Intended Use of Proceeds, Investment-to-price Sensitivity and Stock Price Informativeness: Quantile Regressions

	25% Quantile (1)	50% Quantile (2)	75% Quantile (3)
Constant	0.4584	0.3523	1.2056**
	(0.3377)	(0.3323)	(0.4748)
Fixed asset investment	0.0013	0.0020	0.0091***
	(0.0013)	(0.0013)	(0.0019)
Working capital financing	-0.0046***	-0.0032**	-0.0056**
	(0.0015)	(0.0015)	(0.0022)
Investment in shares of stock	-0.0023**	-0.0019*	-0.0010
	(0.0012)	(0.0011)	(0.0016)
Debt repayment	0.0049***	0.0036***	0.0003
	(0.0011)	(0.0011)	(0.0017)
Disinvestment	0.0007	-0.0005	-0.0027
	(0.0017)	(0.0018)	(0.0026)
Stock price informativeness	-0.4591***	-0.2606*	-0.3088
	(0.1573)	(0.1548)	(0.2212)
Investment-to-price sensitivity	-0.4066	-0.1430	0.2393
	(0.3008)	(0.2960)	(0.4230)
$SENS \times INFO$	0.3635	0.0912	-0.3121
	(0.3046)	(0.2998)	(0.4283)
Total proceeds	0.1037	0.1183	-0.1263
	(0.1139)	(0.1121)	(0.1602)
Firm size	0.0034	0.0086	-0.0815
	(0.0352)	(0.0347)	(0.0496)
Leverage	-0.0849**	-0.0568*	-0.1284***
	(0.0330)	(0.0325)	(0.0465)
Firm age	0.0041***	0.0029**	-0.0019
	(0.0011)	(0.0011)	(0.0016)
Initial condition	-0.0910***	-0.0162	0.0453
	(0.0248)	(0.0244)	(0.0349)
Observations	137	137	137
Pseudo-R^2	0.284	0.204	0.216

Notes: the dependent variable is the cumulative change in industry-adjusted *Sales*/*TA* over the period three years after the IPO year. The estimation is using alternative Epanechnikov kernel function and Chamberlain's bandwidth. Significance at 1%, 5%, and 10% levels (two-sided) are denoted by ***, **, and *, respectively.

Table 7. Employment, Intended Use of Proceeds, Investment-to-price Sensitivity and Stock Price Informativeness: Quantile Regressions

	25% Quantile (1)	50% Quantile (2)	75% Quantile (3)
Constant	-180.7394	-682.4542**	-2,244.9406***
	(347.3554)	(266.2944)	(477.6070)
Fixed asset investment	-3.2546**	-1.2193	-2.6554
	(1.2836)	(0.9841)	(1.7649)
Working capital financing	0.5806	0.7369	1.1404
	(1.5383)	(1.1731)	(2.1149)
Investment in shares of stock	-1.5936	-2.3355***	1.6613
	(1.1038)	(0.8462)	(1.5176)
Debt repayment	2.2576*	0.5199	-4.8753***
	(1.1822)	(0.9063)	(1.6255)
Disinvestment	2.0094	2.2979	4.7286*
	(1.7448)	(1.4313)	(2.3989)
Stock price informativeness	-97.0596	60.0964	-50.7126
	(163.3993)	(125.2674)	(224.6709)
Investment-to-price sensitivity	-767.0248***	-647.6926***	-1,372.3997***
	(282.4968)	(216.5716)	(388.4277)
$SENS \times INFO$	778.2282***	658.2674***	1,391.3766***
	(286.0596)	(219.3030)	(393.3265)
Total proceeds	15.1379	150.7185*	959.1121***
	(111.4535)	(85.4440)	(153.2464)
Firm size	53.4775	133.3070***	458.1734***
	(36.1676)	(27.7273)	(49.7298)
Leverage	-99.2503***	26.0906	-31.2031
	(32.3987)	(24.8380)	(44.5477)
Firm age	-4.1052***	-5.4524***	-10.7510***
	(1.2163)	(0.9325)	(1.6724)
Initial condition	-0.0076	-0.0136***	-0.0018
	(0.0058)	(0.0045)	(0.0080)
Observations	119	119	119
Pseudo-R^2	0.171	0.147	0.247

Notes: the dependent variable is the cumulative change in the number of full time employment over the period three years after the IPO year. The estimation is using alternative Epanechnikov kernel function and Chamberlain's bandwidth. Significance at 1%, 5%, and 10% levels (two-sided) are denoted by ***, **, and *, respectively.

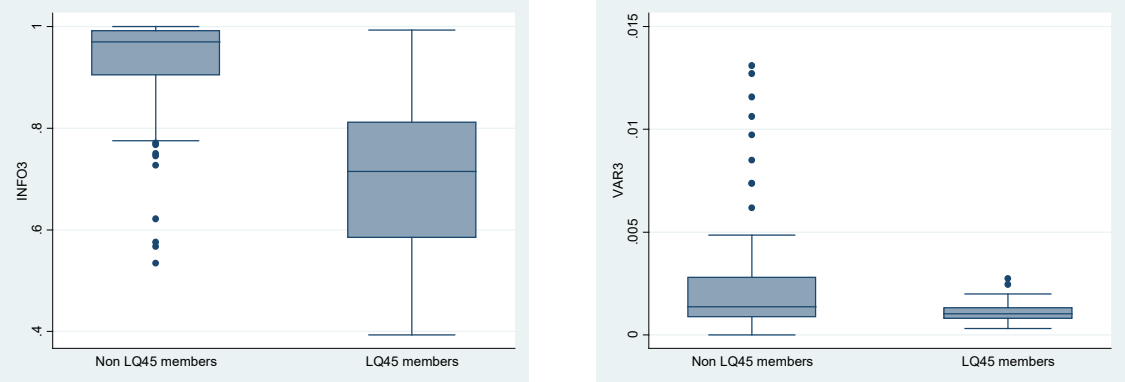


Figure 1. Stock Price Informativeness (left panel) and Variance of the Stock Return (right panel) by LQ45 Memberships

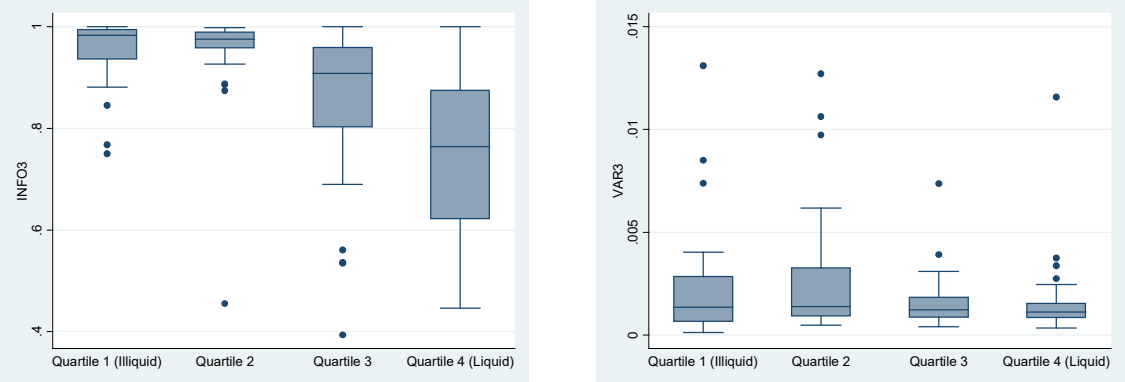
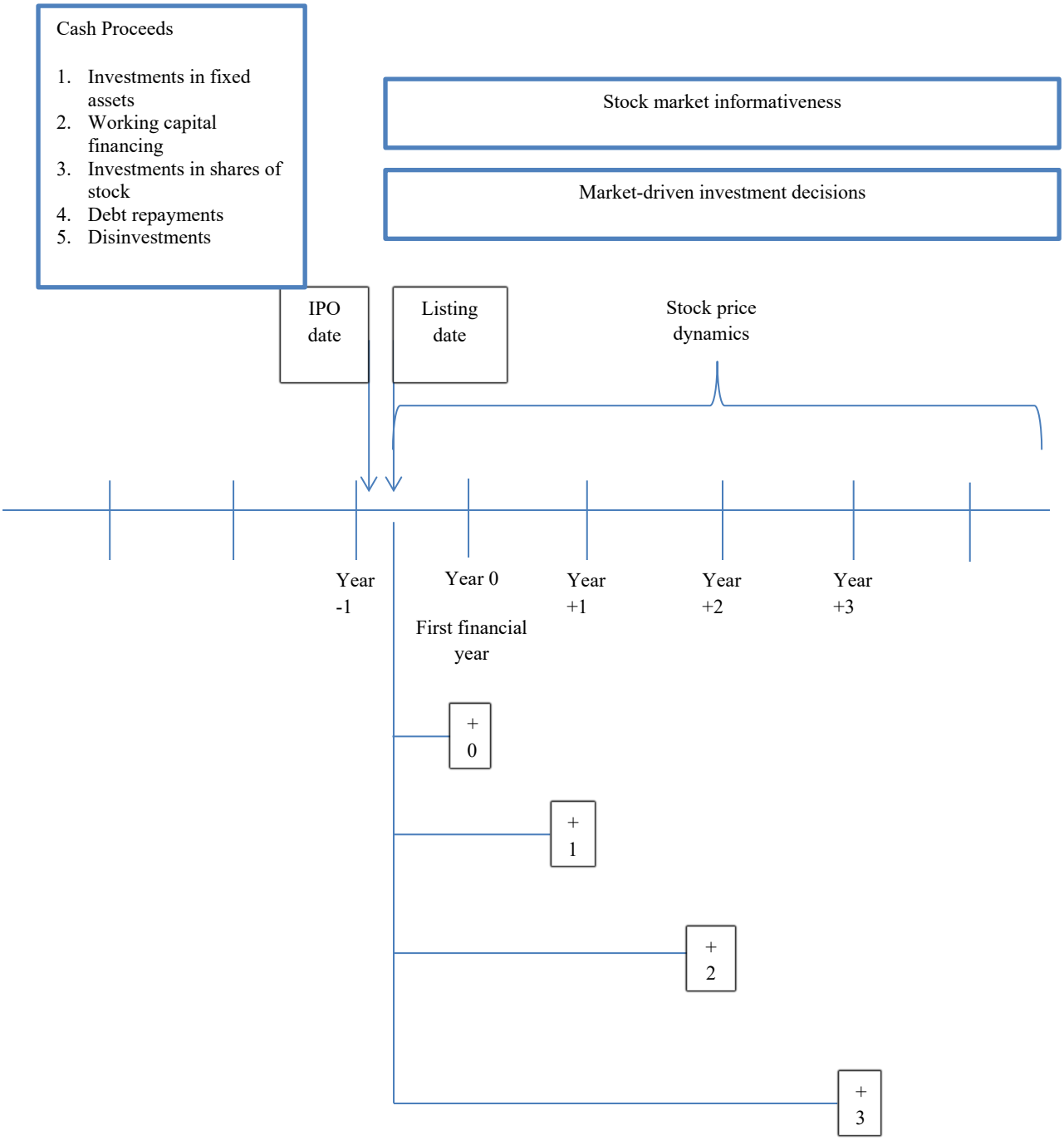


Figure 2. Stock Price Informativeness (left panel) and Variance of the Stock Return (right panel) by Trading Volume

Appendix A. Equity Markets in a Time Line



Appendix B. *EBIT/TA*, Primary and Secondary Equity Markets, and the Retention Rate by the Initial Owners: Quantile Regressions

	25% Quantile (1)	50% Quantile (2)	75% Quantile (3)
Constant	-0.4843***	-0.1629**	-0.3204***
	(0.1169)	(0.0796)	(0.1161)
Fixed asset investment	0.0009**	0.0010***	-0.0002
	(0.0004)	(0.0003)	(0.0004)
Working capital financing	0.0009*	0.0001	-0.0005
	(0.0005)	(0.0003)	(0.0005)
Investment in shares of stock	0.0007*	0.0007***	0.0001
	(0.0004)	(0.0002)	(0.0004)
Debt repayment	-0.0017***	-0.0014***	-0.0006
	(0.0004)	(0.0003)	(0.0004)
Disinvestment	-0.0007	-0.0003	0.0011**
	(0.0006)	(0.0004)	(0.0006)
Stock price informativeness	0.0816	0.0246	0.0951*
	(0.0515)	(0.0350)	(0.0511)
Investment-to-price sensitivity	0.2855***	0.1456**	0.0510
	(0.0974)	(0.0663)	(0.0967)
$SENS \times INFO$	-0.2923***	-0.1356*	-0.0329
	(0.1016)	(0.0692)	(0.1009)
Initial	0.0027***	0.0001	-0.0000
	(0.0007)	(0.0005)	(0.0007)
Initial^2	-0.0000***	-0.0000	-0.0000
	(0.0000)	(0.0000)	(0.0000)
Total proceeds	-0.0463	-0.0289	0.0692**
	(0.0340)	(0.0232)	(0.0338)
Firm size	0.0447***	0.0180**	0.0300**
	(0.0118)	(0.0080)	(0.0117)
Leverage	0.0070	-0.0020	0.0093
	(0.0103)	(0.0070)	(0.0103)
Firm age	0.0015***	0.0008***	0.0011***
	(0.0004)	(0.0003)	(0.0004)
Initial condition	0.0785	0.1391***	0.1266**
	(0.0588)	(0.0400)	(0.0584)
Observations	111	111	111
Pseudo-R^2	0.214	0.143	0.178

Notes: the dependent variable is the cumulative change in operating profit scaled by total assets over the period three years after the IPO year. The estimation is using alternative Epanechnikov kernel function and Chamberlain's bandwidth. Significance at 1%, 5%, and 10% levels (two-sided) are denoted by ***, **, and *, respectively.

Appendix C. *NI/TA*, Primary and Secondary Equity Markets, and the Retention Rate by the Initial Owners: Quantile Regressions

	25% Quantile (1)	50% Quantile (2)	75% Quantile (3)
Constant	-0.2411**	-0.3979***	-0.2025**
	(0.1066)	(0.0808)	(0.0907)
Fixed asset investment	0.0008**	0.0009***	0.0005
	(0.0004)	(0.0003)	(0.0003)
Working capital financing	0.0012***	0.0002	0.0004
	(0.0004)	(0.0003)	(0.0004)
Investment in shares of stock	-0.0001	-0.0000	0.0001
	(0.0003)	(0.0003)	(0.0003)
Debt repayment	-0.0014***	-0.0012***	-0.0009***
	(0.0003)	(0.0003)	(0.0003)
Disinvestment	-0.0004	0.0001	-0.0002
	(0.0005)	(0.0004)	(0.0004)
Stock price informativeness	-0.0491	0.0579	0.0539
	(0.0470)	(0.0356)	(0.0400)
Investment-to-price sensitivity	0.1269	-0.0526	0.0988
	(0.0915)	(0.0693)	(0.0778)
$SENS \times INFO$	-0.1470	0.0600	-0.0809
	(0.0956)	(0.0724)	(0.0813)
Initial	0.0018***	0.0021***	0.0003
	(0.0007)	(0.0005)	(0.0006)
Initial^2	-0.0000*	-0.0000***	-0.0000
	(0.0000)	(0.0000)	(0.0000)
Total proceeds	-0.0117	0.0942***	0.0837***
	(0.0311)	(0.0235)	(0.0264)
Firm size	0.0201*	0.0371***	0.0161*
	(0.0108)	(0.0082)	(0.0092)
Leverage	0.0093	-0.0041	0.0085
	(0.0094)	(0.0071)	(0.0080)
Firm age	0.0007**	0.0009***	0.0010***
	(0.0003)	(0.0003)	(0.0003)
Initial condition	0.0582	0.0146	0.1771***
	(0.0698)	(0.0529)	(0.0593)
Observations	111	111	111
Pseudo-R^2	0.240	0.148	0.208

Notes: the dependent variable is the cumulative change in the net income scaled by total assets over the period three years after the IPO year. The estimation is using alternative Epanechnikov kernel function and Chamberlain's bandwidth. Significance at 1%, 5%, and 10% levels (two-sided) are denoted by ***, **, and *, respectively.

Appendix D. *Sales/TA*, The Primary and Secondary Equity Markets, and the Retention Rate by the Initial Owners: Quantile Regressions

	25% Quantile (1)	50% Quantile (2)	75% Quantile (3)
Constant	0.5919*	0.7411***	1.6442***
	(0.3135)	(0.2806)	(0.4958)
Fixed asset investment	0.0014	0.0005	0.0015
	(0.0011)	(0.0010)	(0.0018)
Working capital financing	-0.0062***	-0.0057***	-0.0035
	(0.0013)	(0.0012)	(0.0022)
Investment in shares of stock	-0.0005	0.0009	0.0007
	(0.0010)	(0.0009)	(0.0016)
Debt repayment	0.0045***	0.0046***	0.0014
	(0.0010)	(0.0009)	(0.0017)
Disinvestment	0.0008	-0.0003	-0.0001
	(0.0015)	(0.0013)	(0.0025)
Stock price informativeness	-0.5124***	-0.3615***	-0.0885
	(0.1368)	(0.1224)	(0.2163)
Investment-to-price sensitivity	-0.9201***	-0.7880***	-0.2645
	(0.2516)	(0.2252)	(0.3979)
$SENS \times INFO$	1.0198***	0.8803***	0.4546
	(0.2627)	(0.2351)	(0.4154)
Initial	-0.0124***	-0.0101***	-0.0078**
	(0.0019)	(0.0017)	(0.0030)
Initial^2	0.0002***	0.0001***	0.0001***
	(0.0000)	(0.0000)	(0.0000)
Total proceeds	-0.0039	0.1285	-0.3151**
	(0.0902)	(0.0807)	(0.1426)
Firm size	0.0115	-0.0179	-0.1605***
	(0.0316)	(0.0283)	(0.0500)
Leverage	-0.1676***	-0.0498**	-0.0657
	(0.0268)	(0.0240)	(0.0424)
Firm age	-0.0010	-0.0024***	-0.0023
	(0.0010)	(0.0009)	(0.0016)
Initial condition	-0.0457**	-0.0419**	0.0429
	(0.0210)	(0.0188)	(0.0331)
Observations	111	111	111
Pseudo-R^2	0.314	0.261	0.252

Notes: the dependent variable is the cumulative change in the net sales called by total assets over the period three years after the IPO year. The estimation is using alternative Epanechnikov kernel function and Chamberlain's bandwidth. Significance at 1%, 5%, and 10% levels (two-sided) are denoted by ***, **, and *, respectively.

Appendix E. *EMPL*, Primary and Secondary Equity Markets, and the Retention Rate by the Initial Owners: Quantile Regressions

	25% Quantile (1)	50% Quantile (2)	75% Quantile (3)
Constant	624.7277	-1,580.5650***	-1,550.9237**
	(486.1206)	(322.6720)	(750.2590)
Fixed asset investment	-7.9593***	-2.9644**	-6.6329**
	(1.7136)	(1.1374)	(2.6446)
Working capital financing	2.9605	1.0517	2.2333
	(2.0370)	(1.3521)	(3.1438)
Investment in shares of stock	1.4889	0.0475	-2.6015
	(1.4633)	(0.9234)	(2.2583)
Debt repayment	-1.4342	0.3320	-7.5863***
	(1.5956)	(1.0069)	(2.4626)
Disinvestment	4.9440**	1.5331	14.5877***
	(2.2788)	(1.4380)	(3.5170)
Stock price informativeness	-530.7711**	483.3200***	-435.0076
	(216.8232)	(143.9206)	(334.6363)
Investment-to-price sensitivity	-112.6622	-1,030.7291***	-2,537.0537***
	(372.8898)	(247.5128)	(575.5031)
$SENS \times INFO$	174.6023	1,094.5435***	2,492.7643***
	(390.0181)	(258.8821)	(601.9384)
Initial	3.5409	-2.6052	4.5848
	(3.0453)	(2.0214)	(4.7000)
Initial^2	-0.0549	0.0313	-0.0322
	(0.0345)	(0.0229)	(0.0532)
Total proceeds	-33.8705	128.5094	710.8457***
	(140.4781)	(93.2451)	(216.8083)
Firm size	-12.5665	231.8528***	373.2772***
	(50.0833)	(33.2438)	(77.2966)
Leverage	50.9368	0.1436	93.5815
	(42.9611)	(28.5163)	(66.3045)
Firm age	-8.5772***	-4.1521***	-13.1674***
	(1.5966)	(1.0598)	(2.4641)
Initial condition	-0.0145	-0.0283***	-0.0314**
	(0.0100)	(0.0066)	(0.0154)
Observations	99	99	99
Pseudo-R^2	0.210	0.159	0.253

Notes: the dependent variable is the cumulative change in the number of full time employment over the period three years after the IPO year. The estimation is using alternative Epanechnikov kernel function and Chamberlain's bandwidth. Significance at 1%, 5%, and 10% levels (two-sided) are denoted by ***, **, and *, respectively.