Nominal Stock Price Anchors: A Global Phenomenon?

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Abstract

Weld, Michaely, Thaler, and Benartzi (2009) find that the average nominal stock price on the New York Stock Exchange and the American Stock Exchange has been approximately $25 since the Great Depression. They report that this "nominal price fixation is primarily a U.S. or North American phenomenon." Using a larger data set from 38 countries, we show that nominal prices of most stocks tend to revert to their initial public offer (IPO) prices. IPO prices are natural anchors because they are the first public prices observed by investors. We demonstrate that corporate actions maintain these nominal stock price anchors.

Anchoring is a cognitive bias that describes the common human tendency to rely excessively on the first piece of information offered (the 'anchor') when making decisions. Tversky and Kahneman (1974) describe an experiment in which a group of students, given 5 seconds to evaluate the product of eight numbers, estimated that 1X2X3X4X5X6X7X8 was 512 but 8X7X6X5X4X3X2X1 was 2,250. The first digit, the anchor, mattered.[1]

Anchors also matter in finance. In an intriguing paper, Weld, Michaely, Thaler, and Benartzi (2009) find that the average nominal price for a share of stock on the New York Stock Exchange (NYSE) and the American Stock Exchange (AMEX) has been approximately $25 since the Great Depression. The price has not even kept pace with the rate of inflation. However, they find that 16 other countries did not share this peculiar trait. Hence, they conclude that the nominal price fixation is primarily a U.S. or North American phenomenon.

The goal of this paper is to revisit their last conclusion. Because anchoring is such a common human trait, we are skeptical that the United States is the only country whose stock markets exhibit this phenomenon. To find out whether the nominal price fixation is indeed a North American phenomenon, we extend the analysis by Weld et al. (2009) to international markets using a larger data set. We collect the nominal stock prices of firms, in both the local currency and the U.S. dollar, at the end of June in each year for 38 countries from 1981–2010.

A few interesting, sometimes, surprising facts stand out in this panel. First, when we compute the mean or median level of stock prices in a country over the sample period, we observe

[1] Epley and Gilovich (2001) establish the existence of both anchoring and heuristic adjustment in the classic Tversky and Kahneman (1974) experiments.

a large variation between countries. The mean (median) of the nominal price level in Switzerland, for example, is $925 ($348.9) whereas that of Hong Kong is only $0.6 ($0.1). The U.S. mean (median) share price is $51.3 ($21.9).[2] It is clear that a single, global anchor does not exist.

Second, surprisingly, the median nominal stock price of all surviving firms in our sample remains remarkably flat and stable throughout the sample period, suggesting that nominal share prices are held roughly constant although these firms generate positive returns on average. In fact, the median level of nominal stock prices in 2010 is remarkably similar to the median level of nominal stock prices 29 years earlier.

Third, a firm's nominal stock price has a tendency to revert to the stock price level that it had when it first entered the panel. When we partition our sample firms into tercile groups by their nominal stock price levels every year and keep track of the tercile group membership, we find that a majority of firms in almost all countries remains in their initial tercile group.

We test this last observation formally using a regression model. We hypothesize that the initial stock price of a listed firm, an IPO price, may well serve as an anchor for future nominal stock prices and may be the most important determinant of nominal share prices. To the extent that investors/managers tend to rely heavily on the first piece of pricing information offered, the IPO price is likely to affect how managers "control" the future nominal stock price with corporate actions such as stock splits, dividend payouts, and reverse stock splits. We run the cross–sectional

[2] The mean nominal price of $51.3 for U.S. stocks in our sample differs from the mean price of $25 in Weld et al. (2009) for many reasons. Our sample covers only the stocks on NYSE from 1981–2010, whereas their sample covers all NYSE and AMEX stocks from 1933–2007. A more important difference is that they exclude Berkshire Hathaway from the sample, whereas we include it. The mean price drops to $26.2 without Berkshire Hathaway in our sample.

regression of a firm's nominal stock price in year t on the IPO price in addition to firm size and institutional ownership, which are shown to be two important determinants of a firm's nominal share price in Dyl and Elliott (2006). Since there is a large variation in the nominal stock price levels across countries, we allow for country–specific coefficients on the explanatory variables (i.e., the explanatory variables are interacted with the country dummy) and country–specific and industry–specific constants. This regression model is equivalent to running the cross–sectional regressions country by country, but the advantage of using this approach is that we can get a single summary measure of explanatory power of our explanatory variables across all countries.

The cross–sectional regression results show that the IPO price is the single most important variable in explaining the current nominal stock price. The IPO price alone without any other explanatory variables explains, on average, 82%. No other variables, whether they are firm–specific, industry–specific, or country–specific, matter as much. Given the paucity of IPO price data, we next use the initial nominal stock price of a firm when it first entered our sample period as an alternative proxy to the IPO price. This dramatically increases the sample size of our previous regression. The results, nevertheless, are remarkably similar. We conclude that the nominal price fixation around an anchor (whether the anchor is the IPO or the initial stock price in the sample) is a global phenomenon. As the U.S. has a large number of observations and, therefore, has a disproportionate large influence on this conclusion, and since a goal of this paper is to answer whether countries outside the U.S. also have anchors, we run the above regressions for the rest of sample countries without the U.S. Our results do not change.

One criticism against the cross–country analysis is that IPO prices across countries are not comparable because in some countries IPO prices are regulated. For instance, in countries like South Korea and Denmark, IPO prices during the early period of our sample were heavily regulated leaving little discretion over the choice of offer prices. A different criticism is that IPO prices are endogenous. Both criticisms are not relevant to our claim that the IPO price plays the role of an anchor price. No matter how IPO prices are determined, whether by regulation or by market demand or by the firm, the finding that IPO prices turn out to be the most important variable affecting nominal stock prices a few decades later suggests that IPO prices are anchors.

Fourth, borrowing the test methodology from Lemmon, Roberts, and Zender (2008), we find that firms adjust their nominal stock prices more promptly toward their anchor prices when their nominal stock prices are high relative to the anchor price than when the stock prices are low relative to the anchor. This result seems intuitive because bringing down nominal prices through stock splits and cash dividends is easier than raising up nominal prices. Deteriorating firm conditions may make it difficult to raise nominal prices.

Fifth, Weld et al. (2009) show that the correlation between average nominal stock prices and the primary stock exchange index in their sample of 16 countries is the lowest and the next–to–lowest for the New York Stock Exchange and the Toronto Stock Exchange, respectively. They argue that the low correlations in the U.S. and Canada are suggestive of the fact that nominal price fixation is primarily a North American phenomenon. Our ranks for these two exchanges for correlations with the value–weighted index in our sample of 38 countries are 34th and 23rd when ordered from the lowest.

Finally, we show that nominal stock prices tend to revert to their anchors due to corporate actions such as stock splits, dividend payouts, or even reverse stock splits. This suggests that corporate managers seem to manage the nominal stock prices. The introduction of the euro in January of 1999 offers a natural experiment that further corroborates this finding. We find a much higher proportion of euro firm managers than non–euro firm managers in Europe taking corporate actions to bring down their nominal share prices just before and after the introduction of the euro. It appears that the introduction of the euro brought in a 'new' anchor for euro firms, which triggered euro firm managers to adjust their nominal stock prices.

Our findings have links, directly and indirectly, with many literatures. The direct link is with Weld et al. (2009), who find that firms proactively use corporate actions like stock splits to keep their prices within a narrow trading range. Why? They conclude that it must be norms and traditions. In our paper, we show that this phenomenon is global, and we therefore conclude that norms and traditions exist in all countries, not just in the U.S. Our paper also has a direct link to Dyl and Elliott (2006), who find that firms tailor their share prices around a specific range to reflect the desires of owners.

The norm uncovered by the above two papers as well as our paper is the existence of an anchor price that firms try to target their nominal share price at. In our paper, unlike the previous two papers, we give evidence identifying the IPO price as the likely anchor price. Our paper, therefore, has an indirect link to the anchoring literature. The underlying theme in this body of literature is that financial market participants make decisions based on a variety of anchors or reference points. George and Hwang (2004) observe that investors use the 52–week high as an

"anchor" against which they value stocks. Hirota and Sunder (2007) show in a laboratory experiment that if investors do not have dividend anchors, price bubbles tend to arise. Baker, Pan, and Wurgler (2012) show that the 52–week high price is a reference point for valuing corporations in mergers and acquisitions. Li and Yu (2012) find that the predictability of the market index also demonstrates this 52–week high effect. Farrell, Krische, and Sedatole (2011) report that employees evaluating the value of their stock options use three simple anchors, one of which is simply the current stock price. Cen, Hilary, and Wei (2013) investigate the role of anchoring bias on financial analysts' earnings forecasts. They find that analysts make optimistic (pessimistic) forecasts when a firm's forecast earnings per share are lower (higher) than the industry median. Chang, Luo, and Ren (2014) observe that cum–day prices are the dominating anchor for ex–day stock valuation. Dougal, Engelberg, Parsons, and Van Wesep (2014) find that the path of credit spreads since a firm's last loan influences the level at which it can currently borrow, indicating that even in a market as highly competitive as syndicated loans, behavioral biases play a role. Our study shows that the anchor of an initial nominal stock price that occurred as long as three decades ago still has a surprising effect on the current nominal stock price.

Incidentally, anchoring exists not just in financial markets but also in many other markets.[3] That leads to our last question. Why do firms use anchors? The anchoring literature in finance

[3] Flood and Mussa (1994) discuss how important inflation anchors are in generating price–stability in monetary policy. Exchange rates serve as anchors (Edwards (1992)). Precedents in legal theory are nothing but anchors (see, for example, Diamond, Rose, Murphy, and Meixner (2011)). In labor economics, the concept of career anchors, first explored by Schein and Maanen (1990), is becoming a fruitful field of study. In marketing, it has been determined that the purchase decision and the sell decision use different anchors (see, Simonson and Drolet (2004)). In real estate, prior price discounts serve as anchors in the housing choice decision (Arbel, Ben–Shahar, and Gabriel (2014)).

suggests that firms are catering to their investors because their investors use anchors. So our paper has important ramifications for the catering hypothesis (Baker, Greenwood, and Wurgler (2009)) literature as well as the investor recognition literature (Merton (1987)). A definite exploration of the question of why firms use anchors, however, is beyond the scope of this paper.

The rest of the paper proceeds as follows. Section I describes our data sources, sample construction, and summary statistics. Section II analyzes the trends in nominal stock prices. Section III shows that the most important determinant of a nominal stock price is its IPO price. Section IV investigates the role of corporate actions in managing the nominal stock price. Section V examines how the introduction of the euro in 1999 exogenously affected anchors and the consequent corporate actions undertaken to deal with this. Section VI presents conclusions.

I. Data

A. Nominal stock price

We start with the 49 countries analyzed in La Porta, Lopez–de–Silanes, and Shleifer (2006). We drop nine countries that have fewer than 40 firms on average or whose macro–economic data are not available in the World Bank database. These nine countries are Ecuador, Jordan, Kenya, Nigeria, Sri Lanka, Taiwan, Uruguay, Venezuela, and Zimbabwe. We also exclude Finland and Mexico because they have less than 10 yearly observations of nominal stock prices prior to their currency regime changes, on which we will elaborate later. The remaining 38 countries have reasonably large stock markets. We collect nominal stock prices of firms listed on each country's main organized exchange, in both the local currency and the U.S. dollar, at the end of June in each year from 1981 to 2010. We define the main organized exchange in a country as the exchange that holds the largest total stock market capitalization of the listed firms in that country. For example, the New York Stock Exchange and the London Stock Exchange, respectively, are the main exchanges in the United States and the United Kingdom. The nominal stock price data are obtained from Datastream. We require that our sample firms have at least 10 consecutive yearly observations of nominal stock prices and market capitalizations. This restriction results in a sample of 21,285 firms from the 38 countries.

The first four columns of Table 1 show the list of countries in the sample, the sample period in each country, the number of firms, and the name of the local currency. There is a large variation in the number of sample firms covered by Datastream across countries ranging from a minimum of 44 firms in Brazil to a maximum of 2,816 firms in the United States. For most countries, the

sample period is 20 to 30 years. The last four columns of Table 1 present the mean and the median of the nominal stock prices at the end of June in each year in the local currency and in the US dollar for each country during the sample period. We notice that that the mean share price is much higher than the median share price in all countries. In quite a few cases, the mean price is several times higher than the median price, suggesting positively skewed distributions in nominal stock prices. An extreme case is Chile, where the mean price (3,813,682 pesos) is 13,620 times greater than the median price (280 pesos). We focus on the median prices in the analyses that follow because of this positive skewness.

(INSERT TABLE 1 HERE)

We note that some of our sample countries have experienced regime changes with respect to their local currencies. For example, nine European countries in our sample adopted the common currency euro in 1999.[4] Turkey revalued its currency in 2005. In the Datastream database, the nominal stock prices in a country before a regime change are denoted in the new currency after the regime change (i.e., the euro for all euro–currency countries, and the new lira for Turkey). This implies that nominal stock prices before the regime change are converted by Datastream to new nominal stock prices using the conversion rate on the date of the regime change. For example, all local currency nominal prices in the euro area before January of 1999 were converted to and presented in euros using the fixed exchange rate set for each country on December 31, 1998.

[4] The number of euro countries in our sample becomes ten as Greece adopted the euro in January 1, 2001.

Similarly, Turkish lira before January 1, 2005 was converted to and presented in the new currency using a fixed conversion rate set on December 31, 2004.

If anchors exist in nominal stock prices, currency regime changes are likely to have disrupted the existing anchors. For this reason, they offer us a natural experiment to observe what happens before, during, and after the change. We will exploit this insight later in our analysis.

B. Other variables

To check whether the stock price at the time of initial public offering serves as an anchor, we obtain a firm's IPO price. 2,817 IPO prices in the 1991–2000 period are matched with our sample firms. We choose the sample period of 1991–2000 because IPO data in Global New Issues of SDC Platinum are incomplete before 1991[5] and we require that the sample firms have at least 10 yearly observations of nominal stock prices after an IPO.

We obtain the firms' institutional ownership and industry classification data from Datastream. Institutional ownership is defined as the proportion of shares exceeding 5% of the total shares outstanding held by institutional investors (such as pension funds and investment companies) among all shares outstanding. Datastream provides its own industry classification codes, which are based on Financial Times Stock Exchange's (FTSE's) industry classification. We use 19 different industry categories for our sample firms.

[5] Henderson, Jegadeesh, and Weisbach (2006) and Gozzi, Levine, and Schmukler (2010) note this.

We also collect from Datastream the total return index of each stock that captures the actual growth in the value of a share held over the previous year to the current year adjusted for all capital distributions, including cash dividends, stock splits, stock dividends, etc.

II. Trends in Nominal Stock Prices

A. Time–series trends of nominal stock prices

In this section, we investigate the time–series trends of nominal stock prices. To obtain an overall picture of the trend in nominal stock prices, we examine the median nominal stock prices of the firms in our sample during the 1981–2010 period. To eliminate the potential effect of entry and exit of firms on the nominal stock price trend, and to eliminate stocks that have mid–period anchor changes (stocks from euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and Turkey), we include only the 1,657 firms that had existed for the entire sample period. To compare averages of nominal prices that are in different local currencies, we "normalize" all local currencies by converting them to USD at the exchange rate that existed on June 30, 2000.

Figure 1 shows the time–series trends. Panel A depicts the trends of the median nominal stock prices and the median total return stock prices of the sample firms. The median nominal stock price in year t is the median of the "normalized" nominal stock prices of the sample firms in year t. The median total return stock price is the median of the adjusted "normalized" stock prices, where the adjusted stock price reflects the actual total return (growth in the value of a share held over the sample period assuming dividends are reinvested). We also present trends in the equal–

and value–weighted total "normalized" index returns constructed from total returns of the 1,657 firms. Both these indices are scaled to be one U.S. dollar as of 1981.

The three time–series of median total return price, equal–weighted index and value–weighted index continuously increase until 2008, suggesting that the actual total returns of the firms are positive during the sample period. However, the median nominal stock price is flat and stable throughout the sample period. This suggests that although firms generate positive returns, their nominal share prices are held roughly constant. The 2010 level of nominal stock prices is remarkably similar to the level of nominal stock prices in 1981. The time series pattern of nominal stock prices is similar to the evidence presented by Dyl and Elliot (2006) in their analyses of U.S. firms' nominal stock prices. Using 1,019 firms with continuous annual price data available for the period from 1976 through 2001, they show that the average nominal price of these firms changes very little over the 26–year period when the S&P 500 Composite index appreciated by 1,063% and the NYSE Composite Index appreciated by 1,238%.

Panel B of Figure 1 compares the level of the median nominal share price with the same three time–series of total return indices in Panel A adjusted for inflation. We use the U.S. consumer price index as the deflator for these 3 time–series. The figure shows that the three inflation–adjusted time series still keep rising and are still above the median nominal stock price time–series even after inflation adjustment, suggesting that nominal stock prices do not even keep pace with inflation. This last conclusion is the same as that of Weld et al. (2009).

(INSERT FIGURE 1 HERE)

We now investigate the phenomenon of a stable median nominal stock price at the firm level. The underlying motivation is simple. One may observe a stable median nominal price level at a global level even when no anchors exist in individual nominal prices. This is possible because upward trends of some nominal stock prices may cancel out downward trends in other nominal stock prices such that one observes no trends in the mean or the median.

B. Reversion of stock prices to initial price level: tercile analysis

In this section, we examine whether a firm's stock price tends to revert to its initial stock price level. For each country in each year, we partition our sample firms into tercile groups based on their nominal stock price levels. We then keep track of a firm's nominal price movement by noting the tercile groups to which it belongs year by year.

Such an analysis can tell us how many firms remain within their initial tercile group over time. If a large firm–specific shock hits a firm, whether positive or negative, its nominal stock price will likely deviate from its initial tercile group. If the firm's manager allows this deviation, the nominal stock price will leave its initial tercile group. On the contrary, if the firm's manager does not allow this deviation but "manages" the nominal share price by corporate actions such as stock splits, stock or cash dividends, and reverse stock splits, the nominal stock price will revert to the tercile group to which it initially belonged.

Table 2 presents the results.[6] The column labeled "< 50%" refers to the number of firms that stay within their initial tercile group for less than 50% of their sample years. Similarly, the columns labeled "50% <= & <75%" and ">=75%" denote the number of firms that stay within their initial tercile group, respectively, between 50% and 75% and more than 75%, of their sample years.

The last row of the table shows that the nominal stock prices of 7,712 sample firms around the world stay in their initial tercile group for more than 75% of the time. These 7,712 firms comprise 39.6% of the total sample of 19,465 firms. If we calculate the percentage of firms that stay in their initial tercile group more than 50% of the time, the percentage rises to 62.9% (=23.3% + 39.6%). When we examine this statistic country by country, we find that the majority of firms stay in their initial tercile group more than half of the time for all countries except Indonesia, South Korea, and Thailand.

(INSERT TABLE 2 HERE)

In sum, Table 2 shows that a majority of our sample firms remain in their initial nominal stock price tercile group most of the time. This finding further confirms our conjecture that most firms seem to have anchors. In the next section, we formally test the role of anchors in explaining nominal stock prices using a regression framework.

[6] In Tables 2 through 7, we exclude from our analysis observations after the introduction of the euro (January 1999) of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and of Turkey after its currency devaluation (January 2005). This is because old anchors get disrupted after the regime changes. Later, in Tables 9 and 9, we use these anchor disruptions as a natural experiment. In Table 2, the number of firms drops to 19,465 from 21,285 in Table 1 as we drop the after–regime–change observations and again require firms to have at least 10 consecutive yearly observations before the regime change.

III. Determinants of Nominal Stock Price: the Role of Anchor

A. The role of the anchor price in predicting current nominal stock price level

In this section, we investigate the role of an anchor in explaining nominal stock prices. We hypothesize that an IPO price may well serve as an anchor for future nominal stock prices. This may occur if investors/managers tend to rely heavily on the first piece of price information available, the IPO price, as 'the anchor'.

Using cross–sectional regressions, we examine the determinants of nominal stock prices and check whether IPO prices serve as the main determinant of the current nominal stock price levels, controlling for other important factors. We rely on prior literature to identify these other important factors. Dyl and Elliott (2006), Baker et al. (2009), and Weld et al. (2009) show a strong cross–sectional relationship between a firm's size and its nominal share price. Weld et al. (2009) also find an industry effect on nominal share prices in the U.S. stock markets. Ferreira and Matos (2008) report that institutional investors have a strong preference for the stocks of large firms with good governance around the world. Chang and Luo (2010) find that stocks with low R–squares in the index model have low prices, are more difficult to value, are subject to noise trading, and attract individual investors. Hence, we include the firm's stock market capitalization and institutional ownership in the regressions as the main control variables. We also include industry dummies to control for the industry effect on the nominal stock price level.

Macroeconomic variables may affect the firm's nominal stock price level. Different levels of institutional development and cultural background in various countries may also influence the

nominal stock price level. There is a large body of law and finance literature that shows that the degree of investor protection affects many aspects of financial markets.[7] When investor rights are well protected, small firms can have easy access to capital markets. When institutions are well developed, IPOs are actively pursued, and small firms with a low price level can be listed. This literature suggests that the degree of investor protection positively affects the proliferation of low–priced stocks.

Cross–cultural differences can also explain nominal stock price levels across countries. For instance, Hofstede's (1980) cultural dimensions theory predicts that some countries tend to accommodate more uncertainty and risk, which may explain the significant presence of penny stocks in some countries that score low on the uncertainty avoidance index.[8] There is also a growing body of literature in which a country's religion affects investors' risk preferences, which again may affect the presence of lottery–type, low–priced stocks in some countries.[9] Instead of controlling for all these country–specific variables, we include the country dummy in our regressions. The country dummy variable should soak up the effects of not only the institutional and cultural aspects of a country but also other time–invariant features that we may have overlooked.

[7] Many authors have contributed to this literature, but, according to our view, the most influential have been a series of papers by La Porta, Lopez–de–Silanes, Shleifer, and Vishny (1998). Their paper provides a good overview.
[8] Hofstede's five culture dimensions are: (i) individualism–collectivism; (ii) uncertainty avoidance; (iii) masculinity–femininity; (iv) power distance; and (v) long–term orientation.
[9] See, for example, Barberis and Huang (2008), Hilary and Hui (2009), Kumar (2009), and Kumar, Page, and Spalt (2011).

Table 3 presents the result of cross–section regressions.[10] We run the cross–section regression for each year of the sample period and report the summary information. The dependent variable is a firm's nominal stock price in "normalized" local currency at the end of June in year t (t=1992, 1993,...2010; so T=19). The independent variables are the firm's IPO price in "normalized" local currency, the firm's log market capitalization in "normalized" local currency at time t–1, and the firm's institutional ownership at time t–1. All independent variables are interacted with country dummies to allow for country–specific coefficients. Industry dummies are also interacted with country dummies to control country–specific industry effects. This regression model is equivalent to running the cross–sectional regressions country by country. The advantage of pooling all countries together in a single regression model is that we can get a single summary measure of the explanatory power of independent variables. Local currencies are normalized by converting to USD at the exchange rate that existed on June 30, 2000.

(INSERT TABLE 3 HERE)

IPO price is the price per share offered by a firm when it becomes public. Log (market value of equity) denotes the natural logarithm of a firm's share price multiplied by its number of shares outstanding. Institutional ownership is strategic ownership collected from Datastream,

[10] We do not run panel regressions because we have a concern that the nominal stock price might be non–stationary, and this would nullify the interpretations obtained from panel regressions. Cross–sectional regressions are free from any problems associated with the non–stationarity of the variable. For robustness, we do run a modified panel regression, and its results (unreported) are qualitatively similar to our cross–sectional results. The modifications are as follows: We first conduct a unit root test at the individual firm level. If a firm's stock price does not have a unit root, the nominal stock prices may or may not be anchor price–reverting (i.e., have an anchor). If it has a unit root, the volatility of the nominal stock prices around the time trend is not finite, and it does not have an anchor. We include only the firms that have no unit roots in their nominal stock prices into the sample for the modified panel regression analysis.

which defines it as the proportion of shares exceeding 5% of total shares outstanding held by institutional investors such as pension funds and investment companies among all shares outstanding (%). Industry classification is Datastream level 3 group (19 industries) based on FTSE's industry classification benchmark. Observations are dropped if the number of IPOs in each year in each country is less than 10. Observations of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and Turkey after currency devaluation of Turkish lira (Jan. 2005) are excluded. All continuous variables are winsorized at 1% and 99% percentiles.

There are N countries in each of the T regressions, and so there are N coefficients, N t–statistics, one R–square and one adjusted R–square per regression. The coefficients and t–statistics are averaged across the N countries for each yearly regression. Table 3 shows the weighted average of these averaged coefficients, averaged t–statistics (shown in parenthesis), R–squares, and adjusted R–squares across T regressions, where the weights are the sample size of each of these T regressions. The first (second) number inside the square brackets denotes the proportion of coefficients that are positively (negatively) significant at 10% level or less. R–squares are shown for the 25^{th}, 50^{th} and 75^{th} percentiles at the bottom of the table.

The regressions cover the period of 1992 to 2010 because we need to use the 1991 IPO price. For firms that entered in our IPO sample after 1991, the regressions are run one year after they enter.

In Panel A of Table 3, we run the regressions using all sample firms from all countries regardless of their sample period. In column (1), we regress the nominal stock prices only on firms'

IPO stock prices. The overall coefficient estimates on the IPO price are positive and highly significant in 66% of the estimated 316 coefficients. It is never negative. The weighted average (median) R^2 is remarkably high at 0.82 (0.88). This means that more than 80% of the variation in the current nominal stock price can be explained by just one piece of time–invariant information: the IPO price. In 2010, for example, the information on the IPO price is 19 years old for firms that went public in 1991, and yet, it has such high explanatory power to explain the variation in 2010 nominal stock prices. In column (2), we replace IPO price with firm size (log of market capitalization). The coefficient estimates on the firm size are significant and positive for also 66% of the coefficients, but 3 coefficients are negatively significant. This indicates that larger firms tend to command higher nominal share prices, an observation also made by Weld et al. (2009). However, the weighted average (median) R^2 significantly drops to 0.38 (0.38). In column (3), we only consider country fixed effects and industry fixed effects. The explanatory power to explain the variation in nominal stock prices significantly drops. The weighted average (median) R^2 is 0.30 (0.29). In column (4), we add all the variables – IPO price, log of market capitalization, country fixed effects and industry fixed effects – to explain the variation in nominal prices. The weighted average (median) R^2 is 0.86 (0.91). Considering that the weighted average (median) R^2 was 0.82 (0.88) with just the IPO price as the explanatory variable, we conclude that the IPO price has by far the highest explanatory power to explain the variation in nominal prices.

In columns (5)–(7), we run regressions for the sample period of 2003–2010, during which we have the firms' institutional ownership data available. In column (5), we only include the IPO price, and we find that the weighted average (median) R^2 is 0.76 (0.80). When we include all the

variables, including institutional ownership variable in the regression in model (7), the weighted average (median) R^2 increases to 0.81 (0.86). If we just include institutional ownership in model (6), the weighted average (median) R^2 is 0.14 (0.14). The coefficient estimates on institutional ownership are not significant and, interestingly, negative for some of the estimates.

One concern with the results in Panel A of Table 3 is that the IPO price in Panel A may be too near in time to its current nominal stock price, and this may drive the results. In Panel B of Table 3, we restrict our dependent variable of nominal stock prices such that they are at least 10 years away from their IPO prices.[11] In column (1) of Panel B, the IPO price alone again explains more than 75% of the variation in the nominal stock prices (weighted average (median) R^2 of 0.77 (0.85)). Other firm–level variables and country and industry fixed effects as regressors do not have as much explanatory power as the IPO price, similar to the results in Panel A.

In sum, the regression results in Table 3 show that the IPO price, our proxy variable for anchor price, is the single most important variable that explains current nominal stock prices and that none of the other variables, whether they are firm–specific, industry–specific, or country–specific, matters much.

As the U.S. has a large number of observations and, therefore, has a disproportionate large influence on the conclusion we draw above, and since a goal of this paper is to answer whether countries outside the U.S. also have anchors, we run the above regressions without the U.S. Table 4 shows the results of these cross–sectional regressions. Our qualitative results do not change.

[11] In Panel A of Table 3, the average time gap between the nominal stock prices and the IPO prices is 8.2 years. The gap becomes larger and is 12.8 years in Panel B.

(INSERT TABLE 4 HERE)

Given the paucity of IPO price data, the above regressions, though exhibiting statistically significant results, do have small sample sizes. To rectify this problem, we use the initial nominal stock price of a firm when it first entered our sample period as an alternative proxy for anchor price. The total sample size significantly increases from 35,811 to 322,089.

Table 1A in the Internet Appendix presents the results of regressions similar to those used in Table 3 (sample includes U.S. firms) but using the firms' initial nominal stock prices instead of IPO prices. The results of Panels A and B in Table 1A, using an alternative proxy to an anchor price instead of the IPO price, are remarkably similar to those of the corresponding panels in Table 3. Table 2A in the Internet Appendix presents the results of regressions similar to those used in Table 4 (sample excludes U.S. firms) but using the firms' initial nominal stock prices instead of IPO prices. The results of Panels A and B in Table 2A, using initial price as an anchor price instead of the IPO price, are remarkably similar to those of the corresponding panels in Table 4.

We conclude: nominal price fixation around an anchor (whether the anchor is the IPO or the initial stock price in the sample) is a global phenomenon of nominal stock prices.

B. Speed of nominal price adjustment to anchor price

In this section, we estimate the speed of adjustment (SOA) of a firm's nominal stock price in getting back to its anchor price. We borrow the test methodology from Lemmon, Roberts, and Zender (2008). Similar to the regression model employed in Lemmon et al. (2008), we assume that nominal price change is a product of speed of adjustment and anchor price ("target price" in

the terminology used by Lemmon et al. (2008)). We assume that the main determinant of anchor prices is the IPO price. We run the following regression model of nominal stock prices.

$$\Delta Nominal\ price_{ft} = v_c + \gamma_1\left(\beta_1 IPO\ price_{1f} + \tau_t + \iota_i - Nominal\ price_{1ft-1}\right) \times v_c + \gamma_2\left(\beta_2 IPO\ price_{2f} + \tau_t + \iota_i - Nominal\ price_{2ft-1}\right) \times v_c + \varepsilon_{it} \quad (1)$$

where τ_t and ι_i are year (time) and industry fixed effects. *IPO price*$_{1f}$ and *Nominal price*$_{1\ ft-1}$ (*IPO price*$_{2f}$ and *Nominal price*$_{2\ ft-1}$) are set to zero when the firm's nominal stock price at t–1 is less than or equal to (greater than) its IPO stock price. If they are not set to zero, then they are set to firm's IPO stock price and nominal stock price at t–1, respectively. All independent variables and year and industry dummies are interacted with country dummies (v_c) to allow for country–specific coefficients. Local currencies are normalized by converting to USD at the exchange rate that existed on June 30, 2000. These prices are winsorized at 1% and 99% percentiles.

The main parameters of interest are γ_1 and γ_2 and $\beta_1$and β_2. γ_1 captures the speed of adjustment when the nominal price is above the anchor whereas γ_2 captures the speed of adjustment when the nominal price is below or equal to the anchor price. If γ_1 and γ_2 are positive, nominal stock prices approach the anchor price and these prices are anchor price–reverting. If they are negative, nominal stock prices move away from the anchor price. $\beta_1$and β_2 measure the extent to which the IPO price has an effect on the anchor price determination. If current nominal stock prices target only IPO prices, which implies that the anchor price is the IPO price, then the

coefficient will be one. As for the computation of standard errors of β_1 and β_2, we use the delta method, a first–order approximation of the Taylor expansion, following Lemmon et al.(2008).[12]

Table 5 presents the results of this test. It shows the weighted average of averaged coefficients, averaged t–statistics (shown in parenthesis), where the weights are the sample size of each country. The first (second) number inside the square brackets denotes the proportion of coefficients that are positively (negatively) significant at 10% level or less. The speed of adjustment estimates, γ_1, are positive and significant in more than 80% of the estimated coefficients in all regression models, indicating that nominal stock prices are indeed IPO price–reverting when the nominal stock prices are higher than the IPO price. The coefficient estimates of the IPO price (β_1) are also significant and positive in approximately 60% of the estimated coefficients in all regression models. This result implies that a firm's IPO price level is an important anchor in guiding the level of its future nominal stock prices even when we control for the stock prices in the previous year. In fact, the estimate of β_1 in column (1) in which we include only the firm's IPO price in the specification of the target price interacted with country dummies is 0.84. This estimate is very close to 1, suggesting that the IPO price is a very strong anchor for the current nominal price. The estimates of β_1 are all close to 1 in columns (2), (3), and (4), where year and industry dummies are interacted with country dummies. The speed of adjustment estimates, γ_2, are also positive in general, indicating that nominal stock prices are indeed anchor

[12] Calculating standard errors of the variables is not trivial; they are presented in the form of the variance of the product of two variables. This is not equal to the product of the variance of each variable: $V(xy) \neq V(x) \times V(y)$. In computing $V(f(x))$ where $f(X) = xy$, we use the delta approximation of the Taylor expansion: $f(x) \approx f(a) + f'(a)(x - a)$. Then $V(f(x)) = E[f(x) - f(\mu)]^2 = E[f(\mu) + f'(\mu)(x - \mu) - f(\mu)]^2 = f'(\mu)^2 E[x - \mu]^2 = f'(\mu)^2 V(x)$.

price–reverting when they are lower than the IPO price. But the magnitude of the coefficient estimates on γ_2 are only half of those on γ_1. The estimates of $\beta_2$are significant only in about 25% of the estimated coefficients.

The above findings suggest that firms adjust their nominal stock prices more promptly toward their IPO prices when their nominal stock prices are high relative to the IPO price than when the stock prices are low relative to the IPO price. It also suggests that the effect of the IPO price on future nominal stock prices is larger when the nominal stock prices are higher than when they are lower than the IPO price.

To conclude, the results of the speed of price adjustment to the anchor indicate that a firm's nominal stock price does revert to its anchor price, and the main determinant of an anchor price is its IPO price. The reversion is stronger when the nominal price is higher than the IPO price than when the nominal price is lower than the IPO price.

(INSERT TABLE 5 HERE)

We redo the above analysis assuming that the initial nominal stock price instead of the IPO price is the anchor. As explained before, this dramatically increases the sample size. Table 3A in the Internet Appendix presents these results. The conclusions are the same as those obtained from Table 5.

C. Comparison with Weld, Michaely, Thaler, and Benartzi (2009)

Weld et al. (2009) assert that nominal price fixation is primarily a U.S. or North American phenomenon. In sharp contrast, we claim that nominal price fixation is a global phenomenon. To

understand why we obtain different results, we examine the nominal price pattern of the U.K. and Japan during 1981 – 2010.[13] Unlike Weld et al. (2009) who examine average nominal prices, we focus on median nominal prices. We believe that the pattern of median nominal price changes presents a more reliable trend than that of average nominal price changes because nominal stock price data are highly skewed due to some outliers. Even in the U.S., adding or dropping a firm such as Berkshire Hathaway makes a huge difference in the interpretation of nominal stock price patterns.

The median nominal stock price in the U.K. in our sample is quite stable throughout the sample period and does not show any trend. It has stayed around the average of £1.2 ranging from the minimum of £0.7 to the maximum of £1.7. In Japan, the nominal stock price is more volatile and the average of the annual median prices ranges from the minimum of ¥680 to the maximum of ¥1,460. However, when one excludes the 1988 – 1991 period, the period of the stock market bubble in Japan, the median nominal share price becomes quite stable. More importantly, median nominal stock prices in Japan show no long–term upward or downward trend whether the bubble period is included or not.

Weld et al. (2009) examine the correlation between average nominal stock prices and the primary stock exchange index for 16 international stock exchanges, and find that the New York Stock Exchange has the lowest correlation at 0.41, followed by the Toronto Stock Exchange with

[13] Weld et al. (2009) examine 16 international stock exchanges in addition to London and Tokyo. They do not mention the other 14 countries they include in their additional analysis. They detail the nominal price movement in the U.K. and Japan, which is the reason we choose to focus on the Tokyo and London stock exchanges.

the correlation of 0.64. They argue that the low correlations in the U.S. and Canada are suggestive of the fact that nominal price fixation is primarily a North American phenomenon.

We follow their approach and examine the magnitude of correlations for our 38 sample countries. Table 6 shows the correlations of median nominal price with median total return stock price, equally– and value–weighted total return index during 1981 – 2010.

(INSERT TABLE 6 HERE)

The correlations of median nominal prices for the US and Canada with their respective value–weighted indices in our sample of 38 countries are 34th and 23rd when ordered from the lowest. The correlations of median nominal prices for the US and Canada with their respective equally–weighted indices in our sample of 38 countries are 34th and 17th when ordered from the lowest. The correlations of median nominal prices for the US and Canada with their respective median total return share price in our sample of 38 countries are 27th and 36th when ordered from the lowest. It appears that the U.S. and Canadian correlations are not among the lowest. These countries are not outliers in this sense.

IV. Corporate Actions and Anchoring

The previous sections show that nominal stock prices tend to stay in their initial tercile group. We also observe that IPO prices are very good predictors of the firms' current nominal stock prices. Formal tests show that nominal stock prices tend to revert to their IPO prices, particularly for positive deviations from the IPO price.

In this section, we examine how the firms manage their nominal stock prices to target an anchor. As average stock returns are positive, nominal stock prices would increase with their

accumulated earnings if the number of shares outstanding did not change and/or there were no payouts. Corporate actions such as stock splits and dividend payouts are the usual managerial instruments in curbing the explosion of the stock price when it becomes too high, whereas reverse stock split is the main tool in preventing the implosion of the stock price when it becomes too low.

Ideally, we would like to document the actual corporate actions that force the nominal prices to change, but such data are not easily available to compile in an international setting. As an alternative approach, we proceed in the following way. We first compute the extent of deviation from the firms' IPO price in the beginning of year t as in equation (2):

$$Deviation\ (D) = \frac{Price_{t-1} - IPO\ Price}{IPO\ Price} \tag{2}$$

We then classify stocks in each country into three groups based on the extent of the deviation in the beginning of year t. A firm belongs to group 1, 2, or 3 if D is less than –0.5, if D is between –0.5 and 0.5, or if D is greater than 0.5, respectively. Stocks in group 1 have their t–1 share prices that are well below (where "well below" is defined as 50% or less) their IPO, stocks in group 2 have their t–1 nominal share prices that are close to their IPO price, and stocks in group 3 have their t–1 nominal share prices that are much higher (where "much higher" is defined as 150% or more) than their IPO price.

We then compute change in the nominal stock price (%) from t–1 to t as:

$$\textit{Change in nominal stock price (\%)} = \frac{Price_t - Price_{t-1} * (1 + total\ return_t)}{Price_{t-1}} \times 100 \qquad (3)$$

where *total return*$_t$ is the actual growth in the value of a share held from year t–1 to year t adjusted for all capital distributions including dividends. Because corporate actions such as stock splits, dividend payouts, and reverse stock splits cause the difference between the actual total return of a share and the return on its nominal share prices, the change in (3) will be 0 if there are no such corporate actions. Based on this observation, we make the following prediction. If the change is over x% (or below –x%), this change is caused by corporate actions that force the nominal stock price to increase (decrease). Without corporate actions, a positive or negative x% change in nominal stock price is not possible. To be conservative, we assume x to be 20%.

We now provide evidence that corporate actions may cause the nominal share price to revert to an anchor. Table 7 presents the number and percentage of nominal stock price changes due to corporate actions per country from July 1981 to June 2010 for firms that have at least 10 consecutive yearly observations. The first four columns of Table 7 list the name of the country and the number of firm–year observations in each group, partitioned by the extent of the deviation of the nominal price from the IPO price as explained in (2). The next six columns show the number of firm–year observations whose nominal stock prices are forced to increase by corporate actions and their percentages by each group, as explained in (3). The last six columns show the number of firm–year observations whose nominal stock prices are forced to decrease by corporate actions and their percentages by each group as explained in (3).

The results in the last row of Table 7 shows that when the firms' nominal stock prices fall by more than 50% compared to their IPO prices (group 1), 2.82% of these firms increase their nominal share prices by corporate actions. However, when the firms' nominal stock prices rise by more than 50% compared to their IPO prices (group 3), only 0.30% of these firms increase their nominal share prices. This figure is almost 9 times lower. We also see that when the firms' nominal stock prices rise by more than 50% compared to their IPO prices (group 3), 10.39% of these firms decrease their nominal share prices. However, when the firms' nominal stock prices fall by more than 50% compared to their IPO prices (group 1), only 4.56% of these firms decrease their nominal share prices by deliberate actions. This figure is less than half.

When we examine this pattern country by country, in none of the 38 countries, corporate actions increase nominal prices more often when their nominal stock prices are considerably higher than their IPO prices than when their nominal stocks are considerably lower than their IPO prices. In only 5 out of 38 countries, corporate actions decrease nominal stock prices more often when their nominal stocks are considerably lower than their IPO prices than when their nominal stocks are considerably higher than their IPO prices.

We also note that the decrease in nominal stock price due to corporate actions such as stock splits and large dividend payouts is more frequent than the increase due to, for example, reverse stock splits. This implies that firms tend to adjust their stock prices more promptly toward the IPO price – the anchor – when they are greater than the anchor. When the prices are lower than the anchor, the adjustment is slower. This finding is consistent with the results in Table 5, which shows that the speed of adjustment to the IPO price is faster when the current nominal price is

higher than the IPO price, but the speed of adjustment is slower when the current nominal price is lower than the IPO price. The fact that dividend payouts and stock splits are easier to do than reverse stock splits may drive the asymmetry. Further, negative dividends are not possible.

(INSERT TABLE 7 HERE)

We redo the above analysis assuming that the initial price instead of the IPO price is the anchor. As explained before, this dramatically increases the sample size. Table 4A in the Internet Appendix presents these results. The conclusions are the same as the one obtained from Table 7.

V. Nominal Stock Price after Euro Introduction

As of January 1, 1999, nominal stock prices in nine European Union members in our sample were converted to the euro using the fixed exchange rate set for each country on December 31, 1998.[14] This currency regime change, which entails the change of nominal price units, is a shock to old anchors. This external shock offers us a natural experiment to investigate what happens before, during, and after the change. In our analysis so far, we have excluded the euro countries after the introduction of the euro from the sample because their old anchors were disrupted. In this section, we include them to find out what their new anchors are.

In Figure 2, we draw the time–series pattern of the nominal stock prices for firms in euro countries and firms in non–euro European countries separately. The figure shows the trend of median nominal stock prices presented for the period 1987 to 2010. We partition the sample into

[14] The nominal stock prices of firms in Greece were converted to euro as of January 1, 2001.

two 12–year periods: 1987 to 1998 before the euro introduction and 1999 to 2010 after the euro introduction. We require that the firms be present during the entire 24–year period. Therefore, we have 350 firms from the euro countries and 463 firms from non–euro European countries.[15] All non–Euro nominal stock prices are "normalized" to Euro using the euro exchange rate at the end of 2000. We plot in Figure 2 each sub–group's median nominal prices in each year for each sub–period.

Figure 2 shows that the median of non–euro European firms' nominal stock prices are quite stable throughout the entire sample period. This is similar to what we observe in Figure 1. However, the average of the median nominal stock prices of euro area firms, whose stock prices are measured in euro instead of their local currency after January 1, 1999, dropped dramatically after the euro introduction. The average median nominal prices in the euro area dropped more than half (€25.0 from €61.4), whereas that of the non–euro European countries stayed almost the same.

(INSERT FIGURE 2 HERE)

In Figure 3, we plot the trend of median absolute difference in nominal stock prices between euro firms and matching non–euro European firms. All non–Euro nominal stock prices are "normalized" to Euro using the euro exchange rate at the end of 2000. We match 350 firms from euro countries in Figure 2 with non–euro European firms in Figure 2 with respect to industry and firm size. A matching firm is selected such that it has the closest market capitalization in the same industry as of the end of June in 1998. Figure 3 shows that the median absolute difference in

[15] We exclude firms from Greece that adopted the euro in 2001 to clearly compare before and after the initial introduction of the euro in 1999. Non–euro European countries are: Denmark, Norway, Sweden, Switzerland, and the United Kingdom.

nominal stock price between firms in euro countries and their matching firms in non–euro European countries significantly drops right after the euro introduction, narrowing the gap between euro firms and their comparable non–euro European neighbors. This suggests that the new anchors for the euro firms, whose old anchors were disrupted by the introduction of the euro in the beginning of 1999, may possibly be the nominal prices of similar European firms that are outside the euro area.

(INSERT FIGURE 3 HERE)

To further investigate the behavior of nominal stock price changes by euro firms in Figures 2 and 3, we partition euro firms into tercile groups by the level of nominal stock prices in 1998 (right before the euro introduction) where tercile group 1 has the lowest nominal price level and tercile group 3 the highest. Figure 4 presents the results.

(INSERT FIGURE 4 HERE)

The results are striking. The median of nominal stock prices in tercile group 1 seldom changes during the entire sample period of 1987–2010. In sharp contrast, euro firms in tercile group 3 experience a dramatic decrease in their nominal stock prices around the introduction of euro in 1999. The median nominal price dropped from €230.6 before euro in 1998 to €64.2 after euro in 2001. Euro firms in tercile group 2 also experience a decrease in their nominal stock prices, although not as dramatic as in tercile group 3.

We conclude, from Figures 2, 3 and 4, that the introduction of the Euro disrupted old anchors in the stock prices of firms in the Euro areas. The new anchors for the euro firms appear to be the nominal prices of similar European firms that are outside the euro area. Interestingly, the

new anchors appeared only for Euro firms with originally high nominal prices; their nominal stock price levels fell whereas Euro firms with originally low nominal prices did not show much change.

An interesting question is whether corporate actions facilitated the drop in the nominal stock price in the euro area. To answer this, we examine the number and percentage of firms whose nominal stock prices in local currency decrease due to corporate actions. We use the same methodology as in Table 7. However, here we focus on firms that took corporate actions to reduce the nominal prices.

Table 8 presents the statistics by year for euro and non–euro European countries, for firms that had been present during the entire period of July 1998 to June 2010. Thus, we have 1,068 firms for euro countries and 1,037 firms for non–euro European countries for this experiment. Columns 3 and 5 in Table 8 present the percentage of firms that took corporate actions to decrease the nominal share prices for euro countries and non–euro European countries, respectively. We notice that a much higher percentage of the euro firms decreases their stock prices by corporate actions right after the euro introduction (1999 and 2000). These percentages in 1999 and 2000 are 11.0% and 15.2%, respectively, and they are much higher than the corresponding percentages for the non–euro European firms in 1999 and 2000 (5.6% and 7.3%, respectively). It is interesting to observe from the last column in Table 8 that after these two years, there appears to be little difference between the percentages of euro and non–euro European firms that reduce their nominal share prices by corporate actions.

(INSERT TABLE 8 HERE)

In Table 9, we partition 1,068 euro firms into tercile groups by the level of nominal stock prices in 1998 – 3 terciles of 356 firms each – and present the number and percentage of firms in each tercile group that took corporate actions to decrease the nominal share prices. We note that a much higher percentage of the euro firms decreases their stock prices by corporate actions in tercile group 3 followed by tercile group 2 followed by tercile group 1. For instance, the proportion of firms decreasing their nominal stock prices during 1999–2000 is 25.6%, 12.9%, and 7.0% for tercile groups 3, 2, and 1, respectively. The last three columns of Table 8 test the null hypothesis of equal means in the statistics among three groups of euro firms and confirm that the results are statistically significant mostly around the time of the Euro introduction (1998 to 2000).

(INSERT TABLE 9 HERE)

The results in Tables 8 and 9, along with Figures 2, 3 and 4, suggest that the typical firm in the euro area intentionally decreased their nominal stock prices after the regime change. Why did this happen? We believe that currency regime changes are likely to disrupt existing anchors present in nominal prices that investors/managers have been accustomed to. The introduction of the euro is likely to have made the 'old' anchor disappear and brought in a 'new' anchor for euro firms. It is plausible that the new anchors will be nominal prices of other European firms that are not in the euro area. One looks for one's neighborhood for a 'norm'. Realizing that their nominal prices in the new currency will be much higher than the nominal prices of non–euro European firms, euro firm managers brought down their stock prices by corporate actions like stock splits or dividend payouts. In other words, euro firm managers adjust their stock prices to a 'new' anchor, the nominal stock prices of other non–euro European firms. We see this happening in Figures 2, 3

and 4. This is consistent with the overall story in Table 7, where we observe that corporate actions deliberately bring down the nominal share prices if they are higher than the anchor. Here the new anchor was nominal prices of other European firms that were not in the euro area.

VI. Conclusions

In this paper, we revisit Weld et al.'s (2009) observation that the average nominal share price of NYSE and AMEX stocks has been approximately $25 since the Great Depression and this "nominal price fixation is primarily a U.S. or North American phenomenon." Using a larger data set of nominal stock prices of individual firms from 38 countries around the world, we compile some evidence in support of the existence of an anchor price in most countries. The nominal price fixation does not appear to be primarily a U.S. or North American phenomenon, but rather a global phenomenon. In other words, anchors are norms (a point made in Weld et al (2009), and norms exist in all countries.

We also find that a very good predictor of a firm's current stock price is its IPO price and/or initial nominal stock price, suggesting that subsequent nominal stock prices tend to revert to their anchor prices, and these anchors are their IPO prices or the initial nominal stock price. The reversion, we document, is stronger if nominal prices are higher than the anchor than when they are lower than the anchor.

Further tests indicate that corporate actions, such as stock splits, dividend payouts, and even reverse stock splits, are responsible for this curious phenomenon. We see this quite

dramatically during the introduction of the euro in 1999, where corporate actions in euro firms adjusted very fast to the disappearance of old anchors and the birth of new anchors.

We do not answer why firms anchor. It is a puzzle. We leave it to future research to explore the motivations of corporations to anchor their nominal share price.

References

Arbel, Y., D. Ben–Shahar, and S. Gabriel, 2014, "Anchoring and Housing Choice: Results of a Natural Policy Experiment," *Regional Science and Urban Economics,* forthcoming.

Barberis, N., and M. Huang, 2008, "Stocks as Lotteries: The Implications of Probability Weighting for Security Prices," *American Economic Review* 98, 2066–2100.

Baker, M., R. Greenwood, and J. Wurgler, 2009, "Catering Through Nominal Share Prices," *Journal of Finance* 64, 2559 – 2590.

Baker, M., X. Pan, and J. Wurgler, 2012, "The Effect of Reference Point Prices on Mergers and Acquisitions," *Journal of Financial Economics* 106, 49–71.

Chang, E., and Y. Luo, 2010, "R–Squared, Noise, and Stock Returns," *University of Hong Kong,* Unpublished Working Paper.

Chang, E., Y. Luo, and J. Ren, 2014, "Ex–Day Returns of Stock Distributions: An Anchoring Explanation," *University of Hong Kong*, Unpublished Working Paper.

Cen, L., G. Hilary, and K. Wei, 2013, "The Role of Anchoring Bias in the Equity Market: Evidence from Analysts' Earnings Forecasts and Stock Returns," *Journal of Financial and Quantitative Analysis* 48 (1), 47–76.

Diamond, S., M. Rose, B. Murphy, and J. Meixner, 2011, "Damage Anchors on Real Juries," *Empirical Legal Studies 8,* 148–78.

Dougal, C., J. Engelberg, C. Parsons, and E. Van Wesep, 2014, "Anchoring on Credit Spreads," *Journal of Finance,* forthcoming.

Dyl, E., and W. Elliott, 2006, "The Share Price Puzzle," *Journal of Business* 79, 2045–2066.

Edwards, S., 1992, "Exchange Rates as Nominal Anchors," *National Bureau of Economic Research,* Working Paper, No. 4246.

Epley, E., and T. Gilovich, 2001, "Putting Adjustment Heuristic: Differential Processing of Self–Generated and Experimenter–Provided Anchors," *Psychological Science* 12, 391–396.

Farrell, A., S. Krische, and K. Sedatole, 2011, "Employees' Subjective Valuations of Their Stock Options: Evidence on the Distribution of Valuations and the Use of Simple Anchors," *Contemporary Accounting Research* 28(3), 747–793.

Ferreira, M., and P. Matos, 2008, "The Colors of Investors' Money: The Role of Institutional Investors around the World," *Journal of Financial Economics* 88, 499–533.

Flood, R., and M. Mussa, 1994, "Issues Concerning Nominal Anchors for Monetary Policy," *National Bureau of Economic Research*, Working Paper, No. 4850.

George, T., and C–Y. Hwang, 2004, "The 52–week High and Momentum Investing," *Journal of Finance* 59, 2145–2176.

Gozzi, J., R. Levine, and S. Schmukler, 2010, "Patterns of International Capital Raisings," *Journal of International Economics* 80, 45–57.

Henderson, B., N. Jegadeesh, and M. Weisbach, 2006, "World Markets for Raising New Capital," *Journal of Financial Economics* 82, 63–101.

Hilary, G., and K. Hui, 2009, "Does Religion Matter in Corporate Decision Making in America?" *Journal of Financial Economics* 93, 455–473.

Hirota, S., and S. Sunder, 2007, "Price Bubbles sans Dividend Anchors: Evidence from Laboratory Stock Markets," *Journal of Economic Dynamics & Control* 31, 1875–1909.

Hofstede, G., 1980, *Culture's Consequences: International Differences in Work–Related Values,* Sage Publication, Beverly Hills, CA.

Kumar, A., 2009, "Who Gambles in the Stock Market?" *Journal of Finance* 64, 1889–1933.

Kumar, A., J. Page, and O. Spalt, 2011, "Religious Beliefs, Gambling Attitudes, and Financial Market Outcomes," *Journal of Financial Economics* 102, 671–708.

La Porta, R., F. Lopez–de–Silanes, A. Shleifer, and R. Vishny, 1998, "Law and Finance," *Journal of Political Economy* 106, 1113–1115.

La Porta, R., F. Lopez–de–Silanes, and A. Shleifer, 2006, "What Works in Securities Laws?" *Journal of Finance* 61, 1–33.

Lemmon, M., M. Roberts, and J. Zender, 2008, "Back to the Beginning: Persistence and the Cross–Section of Corporate Capital Structure," *Journal of Finance* 63, 1575–1608.

Li, J., and J. Yu, 2012, "Investor attention, Psychological Anchors, and Stock Return Predictability," *Journal of Financial Economics* 104, 401–409.

Merton, R., 1987, "A simple model of capital market equilibrium with incomplete information," *Journal of Finance* 42, 483–510.

Schein, E., and J. Van Maanen, 1990, *Career Anchors*, John Wiley and Sons, New York, NY.

Simonson, I., and A. Drolet, 2004, "Anchoring Effects on Consumers' Willingness-to-Pay and Willingness-to-Accept," *Journal of Consumer Research* 3, 681–690.

Tversky, A., and D. Kahneman, 1974, "Judgment under Uncertainty: Heuristics and Biases," *Science* 185, 1124–1131.

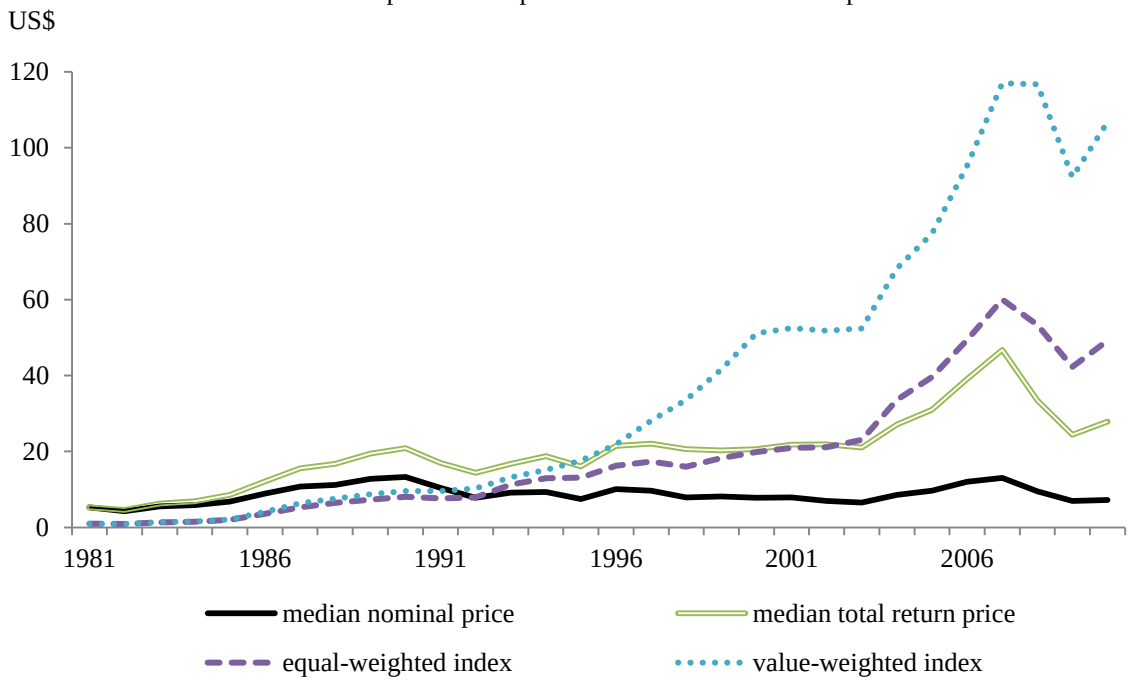
Weld, W., R. Michaely, R. Thaler, and S. Benartzi, 2009, "The Nominal Share Price Puzzle," *Journal of Economic Perspectives* 23, 121–142.

Figure 1

Trends of median nominal stock price, median total return stock price, equally– and value–weighted total return index

Panel A shows the trend of median nominal stock price, median total return stock price, equally– and value–weighted total return index for the period 1981 to 2010 for 1,657 firms that had been present during the whole sample period. Euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and Turkey are excluded. All local currencies are "normalized" by converting them to USD at the exchange rate that existed on June 30, 2000. The median nominal stock price in year t is the median of the "normalized" nominal stock prices of the sample firms in year t. The median total return stock price is the median of the adjusted "normalized" stock prices, where the adjusted stock price reflects the actual total return (growth in the value of a share held over the sample period assuming dividends are reinvested). We also present trends in the equal– and value–weighted total "normalized" index returns constructed from total returns of the 1,657 firms. Both indices are scaled to be one U.S. dollar as of 1981. Panel B shows the trend of median nominal stock price, deflated median total return stock price, deflated equally– and deflated value–weighted total return index. The last three series are deflated by the consumer price index of the U.S.

A. Median nominal stock price in comparison with total return stock price and indices



B. Median nominal stock price in comparison with inflation–adjusted total return stock price and indices

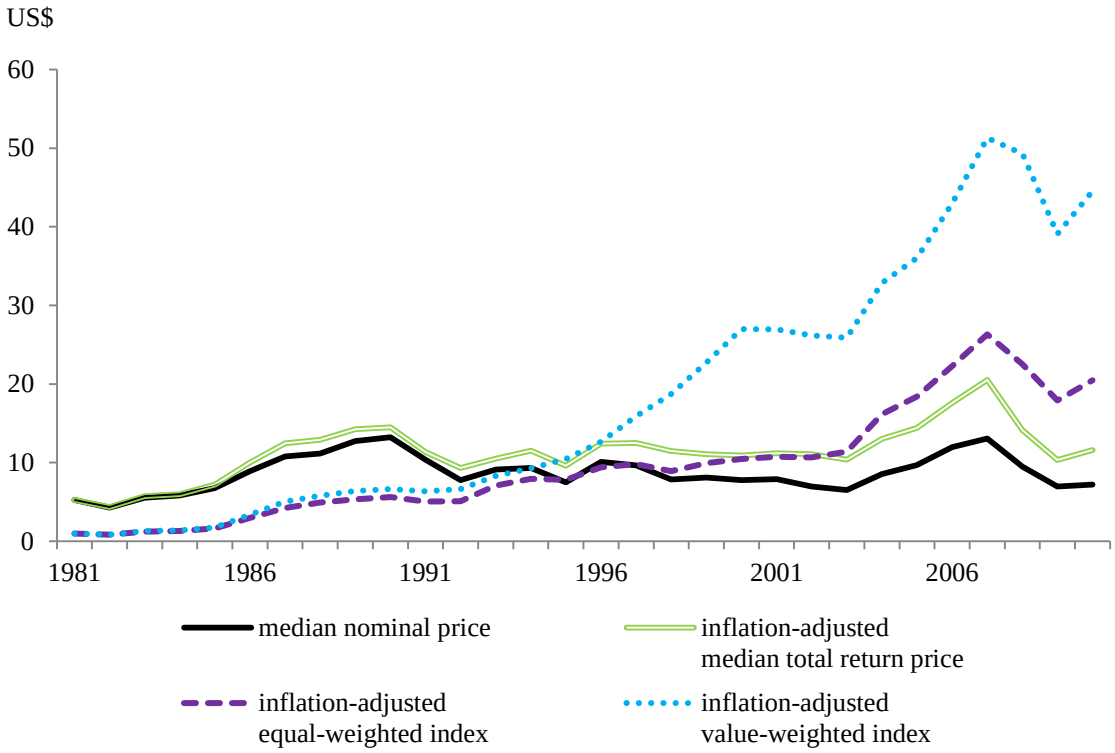


Figure 2
Trend of median nominal stock price of euro and non–euro European countries in euro
The figure shows the trend of median nominal stock prices at the end of June in each year for 1987 to 2010, partitioned into two 12–year periods (1987 to 1998, and 1999 to 2010), for firms that had been present during the entire 1987 to 2010 period. Firms are divided into two groups: 350 firms from the euro countries (excluding Greece which adopted the euro in Jan. 2001) and 463 firms from non–euro European countries. All non–Euro nominal stock prices are "normalized" to Euro using the euro exchange rate at the end of 2000. Euro countries are Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Portugal, and Spain. Non–euro European countries are Denmark, Norway, Sweden, Switzerland, and the U.K. The "average" is the average of each year's median nominal price for each sub–group for each sub–period.

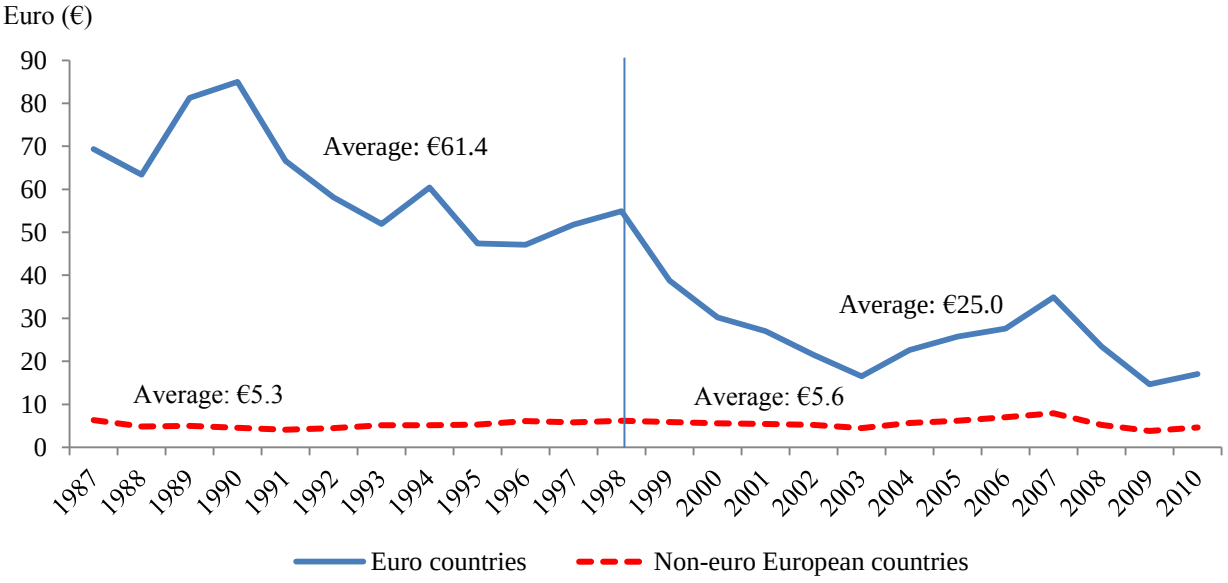


Figure 3

Trend of median absolute difference in nominal stock price in euro between firms in euro countries and their matching firms in non–euro European countries

The figure shows the trend of median absolute difference in nominal stock prices between euro firms and matching non–euro European firms. All nominal prices are at the end of June each year. All non–Euro nominal stock prices are "normalized" to Euro using the euro exchange rate at the end of 2000. The sample firms in the figure have to have been present during the entire 1987 to 2010 period. 350 firms from euro countries in figure 2 are matched with non–euro European firms in figure 2 with respect to industry and firm size. A matching firm is selected such that it has the closest market capitalization in the same industry as of the end of June in 1998. Euro countries include Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Portugal, and Spain (excluding Greece which adopted the euro in Jan. 2001). Non–euro European countries include Denmark, Norway, Sweden, Switzerland, and the U.K.

Figure 4
Trend of median nominal stock price of euro countries in euro, partitioned into tercile groups
The figure shows the trend of median nominal stock prices at the end of June in each year for 1987 to 2010, of 350 firms that had been present during the entire 1987 to 2010 period. All non–Euro nominal stock prices are "normalized" to Euro using the euro exchange rate at the end of 2000. The firms are partitioned into tercile groups with respect to the level of nominal stock prices in 1998 (right before the euro introduction), where tercile group 1 has the lowest nominal price level and tercile group 3 the highest. Euro countries are Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Portugal, and Spain (excluding Greece which adopted the euro in Jan. 2001).

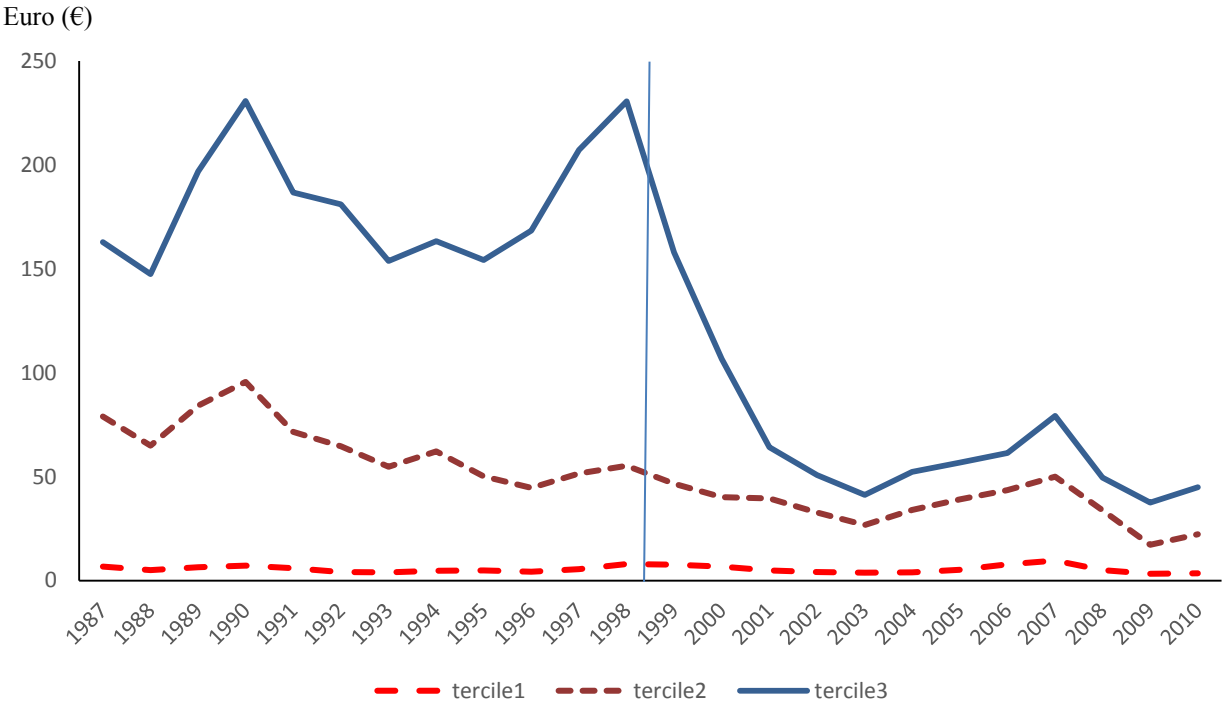


Table 1
Mean and median of nominal stock prices per country
This table shows the mean and median of nominal stock prices in local currency at the end of June in each year from 1981 to 2010 per country. It also shows the mean and median of nominal stock prices in USD at the end of June in each year from 1981 to 2010 per country. To be included in the sample, firms are required to have at least 10 consecutive yearly observations.

Country	Period	No. of firms	Local currency			USD	
			Name	Mean	Median	Mean	Median
Argentina	94 ~ 10	80	Argentine peso	4.6	2.0	2.4	1.0
Australia	81 ~ 10	1,154	Australian dollar	2.2	0.4	1.6	0.3
Austria	86 ~ 10	114	Euro*	143.7	47.5	164.5	55.1
Belgium	81 ~ 10	206	Euro*	249.5	72.6	287.1	79.3
Brazil	94 ~ 10	44	Real	90.3	25.0	55.8	13.5
Canada	81 ~ 10	1,351	Canadian dollar	9.3	3.1	7.3	2.4
Chile	90 ~ 10	208	Chilean peso	3,813,682	280.0	7,748.5	0.6
Colombia	95 ~ 10	51	Colombian peso	5,436.4	1,500.0	2.8	0.8
Denmark	87 ~ 10	224	Danish krone	1,609.8	335.0	248.9	51.2
Egypt	97 ~ 10	95	Egyptian pound	58.3	24.4	12.6	5.0
France	81 ~ 10	966	Euro*	109.5	40.9	125.9	45.5
Germany	81 ~ 10	846	Euro*	134.9	36.5	152.3	41.4
Greece	88 ~ 10	279	Euro*	8.5	4.0	11.0	4.8
Hong Kong	81 ~ 10	736	Hong Kong dollar	4.4	1.0	0.6	0.1
India	90 ~ 10	1,524	Indian rupee	51.0	9.2	1.4	0.2
Indonesia	91 ~ 10	264	Rupiah	2,849.2	850.4	0.7	0.1
Ireland	86 ~ 10	71	Euro*	4.3	2.0	5.1	2.3
Israel	86 ~ 10	559	New shekel	128.7	6.9	43.1	1.9
Italy	81 ~ 10	312	Euro*	6.7	3.1	8.4	3.9
Japan	81 ~ 10	2,343	Yen	10,720.2	706.0	93.1	5.8
Malaysia	86 ~ 10	721	Ringgit	3.4	1.9	1.2	0.5
Netherlands	81 ~ 10	233	Euro*	118.6	24.7	127.3	27.2
New Zealand	99 ~ 10	66	New Zealand dollar	2.3	1.4	1.4	0.8
Norway	81 ~ 10	180	Norwegian krone	166.1	88.5	24.0	12.7
Pakistan	93 ~ 10	301	Pakistani rupee	63.6	18.0	1.2	0.3
Peru	92 ~ 10	126	Nuevo sol	149.6	1.6	48.3	0.6
Philippines	90 ~ 10	209	Philippine peso	41.5	1.8	1.2	0.0
Portugal	88 ~ 10	116	Euro*	10.2	6.5	12.4	7.9
Singapore	83 ~ 10	369	Singapore dollar	2.3	0.9	1.4	0.5
South Africa	81 ~ 10	463	Rand	22.6	5.0	5.4	1.0
South Korea	85 ~ 10	785	Won	21,307	12,450	22.8	13.7
Spain	87 ~ 10	170	Euro*	23.9	13.5	30.2	16.2
Sweden	82 ~ 10	325	Krona	98.6	63.0	13.4	8.2
Switzerland	81 ~ 10	298	Swiss franc	1,397.9	510.0	925.0	348.9
Thailand	89 ~ 10	385	Baht	76.6	22.7	2.7	0.6

Turkey	92 ~ 10	272	Turkish lira**	16.1	4.2	123.0	5.2
United Kingdom	81 ~ 10	2,023	British pound	3.3	1.2	5.4	2.0
United States	81 ~ 10	2,816	US dollar	51.3	21.9	51.3	21.9
Total	**81 ~ 10**	**21,285**				**135.9**	**4.0**

* Local currencies before January 1999 (2001) were converted to euro using fixed exchange rates set on December 31, 1998 (2000 for Greece).
** Old currencies before January 2005 were converted to new currencies using fixed conversion rates

Table 2

Percentage of firms whose stock prices in local currency remain in their initial tercile groups per country

This table presents the number and percentage of firms whose stock prices remain in their initial tercile groups for a certain percentage of the time for which they are in the sample. The nominal stock prices for each year are determined at the end of June in each year for the period 1981 to 2010. Observations after the introduction of the euro (Jan. 1999) of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. To be included in the sample, firms are required to have at least 10 consecutive yearly observations. Nominal stock prices for each country in each year are partitioned by tercile groups and are assigned into a tercile group. The initial tercile group for a firm is the tercile group that it belongs to when it is initially included in the sample period. The column labeled "< 50%" refers to the number (or the percentage) of firms that stay within their initial tercile group less than 50% of their sample years. Similarly, the columns labeled "50% <= & <75%" and ">=75%" denote the number (or the percentage) of firms that stay within their initial tercile group between 50% and 75%, and greater than 75%, respectively, of their sample years.

Country	Period	All (A)	Number of firms that remain in their initial tercile group during sample period (B)			B/A (%)		
			< 50%	50% <= & < 75%	>= 75%	< 50%	50% <= & <75%	>= 75%
Argentina	94 ~ 10	80	33	22	25	41.3	27.5	31.3
Australia	81 ~ 10	1,154	390	298	466	33.8	25.8	40.4
Austria	86 ~ 98	51	17	11	23	33.3	21.6	45.1
Belgium	81 ~ 98	110	32	18	60	29.1	16.4	54.5
Brazil	94 ~ 10	44	16	15	13	36.4	34.1	29.5
Canada	81 ~ 10	1,351	440	310	601	32.6	22.9	44.5
Chile	90 ~ 10	208	44	28	136	21.2	13.5	65.4
Colombia	95 ~ 10	51	11	9	31	21.6	17.6	60.8
Denmark	87 ~ 10	224	94	69	61	42.0	30.8	27.2
Egypt	97 ~ 10	95	39	21	35	41.1	22.1	36.8
France	81 ~ 98	437	148	93	196	33.9	21.3	44.9
Germany	81 ~ 98	355	97	86	172	27.3	24.2	48.5
Greece	88 ~ 98	71	14	18	39	19.7	25.4	54.9
Hong Kong	81 ~ 10	736	341	171	224	46.3	23.2	30.4
India	90 ~ 10	1,524	602	415	507	39.5	27.2	33.3
Indonesia	91 ~ 10	264	138	62	64	52.3	23.5	24.2
Ireland	86 ~ 98	53	19	6	28	35.8	11.3	52.8
Israel	86 ~ 10	559	202	118	239	36.1	21.1	42.8
Italy	81 ~ 98	180	44	34	102	24.4	18.9	56.7
Japan	81 ~ 10	2,343	818	503	1,022	34.9	21.5	43.6
Malaysia	86 ~ 10	721	342	171	208	47.4	23.7	28.8
Netherlands	81 ~ 98	177	76	37	64	42.9	20.9	36.2
New Zealand	99 ~ 10	66	6	15	45	9.1	22.7	68.2

Norway	81 ~ 10	180	66	47	67	36.7	26.1	37.2
Pakistan	93 ~ 10	301	91	62	148	30.2	20.6	49.2
Peru	92 ~ 10	126	31	38	57	24.6	30.2	45.2
Philippines	90 ~ 10	209	69	38	102	33.0	18.2	48.8
Portugal	88 ~ 98	69	18	19	32	26.1	27.5	46.4
Singapore	83 ~ 10	369	142	84	143	38.5	22.8	38.8
South Africa	81 ~ 10	463	121	100	242	26.1	21.6	52.3
South Korea	85 ~ 10	785	413	190	182	52.6	24.2	23.2
Spain	87 ~ 98	94	31	18	45	33.0	19.1	47.9
Sweden	82 ~ 10	325	134	78	113	41.2	24.0	34.8
Switzerland	81 ~ 10	298	113	83	102	37.9	27.9	34.2
Thailand	89 ~ 10	385	200	88	97	51.9	22.9	25.2
Turkey	92 ~ 04	168	82	31	55	48.8	18.5	32.7
United Kingdom	81 ~ 10	2,023	741	432	850	36.6	21.4	42.0
United States	81 ~ 10	2,816	999	701	1,116	35.5	24.9	39.6
Total	**81 ~ 10**	**19,465**	**7,214**	**4,539**	**7,712**	**37.1**	**23.3**	**39.6**

Table 3
Cross–section regressions of nominal stock prices on firm's IPO prices

This table presents the result of T cross–section regressions. The dependent variable is a firm's nominal stock price in "normalized" local currency at the end of June in year t (t=1992, 1993,...2010; so T=19). The independent variables are the firm's IPO price in "normalized" local currency, the firm's log market capitalization in "normalized" local currency at time t–1, and the firm's institutional ownership at time t–1. All three independent variables and industry dummies are interacted with country dummies. IPO price is the price per share offered by a firm when it becomes public. Log (market value of equity) is the natural logarithm of a firm's share price multiplied by its number of shares outstanding. Institutional ownership is strategic ownership collected from Datastream, which defines it as the proportion of shares exceeding 5% of total shares outstanding held by institutional investors such as pension funds and investment companies among all shares outstanding (%). Local currencies are normalized by converting to USD at the exchange rate that existed on June 30, 2000. Industry classification is Datastream level 3 group (19 industries) based on FTSE's industry classification benchmark. Observations are dropped if the number of IPOs in each year in each country is less than 10. Observations of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. The coefficients and t–statistics are based on White heteroscedasticity–corrected standard errors. There are N countries in each of the T regressions, and so there are N coefficients, N t–stats, one R–square and one adjusted R–square per regression. The coefficients and t–stats are averaged across the N countries. The table below shows the weighted average of these averaged coefficients, averaged t–stats (shown in parenthesis), R–squares, and adjusted R–squares across T regressions, where the weights are the sample size of each of these T regressions. The 25^{th}, 50^{th} and 75^{th} percentile of the R–squares are also shown. The first (second) number inside the square brackets denotes the proportions of coefficients that are positively (negatively) significant at 10% level or less. All continuous variables are winsorized at 1% and 99% percentiles.

Variables	Panel A: All sample						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Interaction of country dummies with							
IPO price	0.57			0.39	0.56		0.22
	(5.04)			(2.92)	(4.16)		(2.16)
	[0.66,0.00]			[0.46,0.04]	[0.58,0.04]		[0.35,0.10]
Log (market value of equity)		8.52		3.88			6.24
		(3.58)		(3.54)			(5.38)
		[0.66,0.01]		[0.70,0.01]			[0.79,0.00]
Institutional ownership						–0.02	0.09
						(–0.31)	(1.15)
						[0.07,0.19]	[0.15,0.11]

Dummies	Country	Country	Country × Industry	Country × Industry	Country	Country	Country × Industry
Number of							
Regressions	19	19	19	19	8	8	8
Regressions × countries	316	316	316	316	143	143	143
Observations (total)	35,811	35,811	35,811	35,811	16,694	16,694	16,694
R^2: average	0.82	0.38	0.30	0.86	0.76	0.14	0.81
25^{th}	0.76	0.31	0.26	0.85	0.60	0.11	0.68
median	0.88	0.38	0.29	0.91	0.80	0.14	0.86
75^{th}	0.89	0.67	0.39	0.96	0.91	0.16	0.94
Adj. R^2: average	0.82	0.37	0.20	0.84	0.75	0.12	0.78

Variables	Panel B: Sample of nominal prices that are 10 or more years away from the IPO price						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IPO price	0.57 (2.69) [0.55,0.00]			0.21 (1.44) [0.35,0.06]	0.72 (2.72) [0.53,0.01]		0.22 (1.15) [034,0.09]
Log (market value of equity)		5.48 (5.15) [0.73,0.00]		6.31 (4.97) [0.73,0.00]			5.21 (5.35) [0.72,0.00]
Institutional ownership						0.02 (–0.34) [0.07,0.23]	0.04 (0.17) [0.15,0.13]
Dummies	Country	Country	Country × Industry	Country × Industry	Country	Country	Country × Industry
Number of							
Regressions	10	10	10	10	8	8	8
Regressions × Countries	147	147	147	147	116	116	116

Observations (total)	13,553	13,553	13,553	13,553	10,448	10,448	10,448
R^2: average	0.77	0.52	0.28	0.82	0.76	0.12	0.81
25^{th}	0.71	0.55	0.24	0.85	0.70	0.11	0.76
median	0.85	0.57	0.26	0.92	0.90	0.12	0.92
75^{th}	0.91	0.68	0.50	0.94	0.91	0.14	0.93
Adj. R^2: average	0.76	0.51	0.16	0.79	0.76	0.10	0.77

Table 4

Cross–section regressions of nominal stock prices on firm's IPO prices without the U.S.

This table presents the result of T cross–section regressions. The dependent variable is a non–US firm's nominal stock price in "normalized" local currency at the end of June in year t (t=1992, 1993,…2010; so T=19). The independent variables are the firm's IPO price in "normalized" local currency, the firm's log market capitalization in "normalized" local currency at time t–1, and the firm's institutional ownership at time t–1. All three independent variables and industry dummies are interacted with country dummies. IPO price is the price per share offered by a firm when it becomes public. Log (market value of equity) is the natural logarithm of a firm's share price multiplied by its number of shares outstanding. Institutional ownership is strategic ownership collected from Datastream, which defines it as the proportion of shares exceeding 5% of total shares outstanding held by institutional investors such as pension funds and investment companies among all shares outstanding (%). Local currencies are normalized by converting to USD at the exchange rate that existed on June 30, 2000. Industry classification is Datastream level 3 group (19 industries) based on FTSE's industry classification benchmark. Observations are dropped if the number of IPOs in each year in each country is less than 10. Observations of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. The coefficients and t–statistics are based on White heteroscedasticity–corrected standard errors. There are N countries in each of the T regressions, and so there are N coefficients, N t–stats, one R–square and one adjusted R–square per regression. The coefficients and t–stats are averaged across the N countries. The table below shows the weighted average of these averaged coefficients, averaged t–stats (shown in parenthesis), R–squares, and adjusted R–squares across T regressions, where the weights are the sample size of each of these T regressions. The 25^{th}, 50^{th} and 75^{th} percentile of the R–squares are also shown. The first (second) number inside the square brackets denotes the proportions of coefficients that are positively (negatively) significant at 10% level or less. All continuous variables are winsorized at 1% and 99% percentiles.

Variables	Panel A: All sample						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Interaction of country dummies with							
IPO price	0.57			0.39	0.56		0.21
	(5.24)			(3.03)	(4.30)		(2.20)
	[0.67,0.00]			[0.47,0.01]	[0.57,0.04]		[0.36,0.10]
Log (market value of equity)		8.86		4.01			6.53
		(3.60)		(3.56)			(5.53)
		[0.64,0.01]		[0.69,0.01]			[0.78,0.00]
Institutional ownership						–0.02	0.11
						(–0.26)	(–0.04)
						[0.05,0.17]	[0.14,0.11]

Dummies	Country	Country	Country × Industry	Country × Industry	Country	Country	Country × Industry
Number of							
Regressions	19	19	19	19	8	8	8
Regressions × countries	298	298	298	298	135	135	135
Observations (total)	34,061	34,061	34,061	34,061	15,821	15,821	15,821
R^2: average	0.82	0.38	0.29	0.86	0.76	0.13	0.81
25^{th}	0.76	0.31	0.25	0.85	0.60	0.11	0.68
median	0.88	0.38	0.28	0.91	0.80	0.13	0.86
75^{th}	0.90	0.67	0.38	0.96	0.91	0.15	0.94
Adj. R^2: average	0.82	0.37	0.19	0.84	0.75	0.11	0.78

Variables	Panel B: Sample of nominal prices that are 10 or more years away from the IPO price						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IPO price	0.56 (2.76) [0.56,0.00]			0.20 (1.48) [0.37,0.07]	0.73 (2.79) [0.53,0.01]		0.19 (1.14) [0.35,0.10]
Log (market value of equity)		5.75 (5.29) [0.71,0.00]		6.63 (5.07) [0.71,0.00]			5.47 (5.49) [0.70,0.00]
Institutional ownership						0.03 (–0.24) [0.08,0.20]	0.05 (0.24) [0.17,0.12]
Dummies	Country	Country	Country × Industry	Country × Industry	Country	Country	Country × Industry
Number of							
Regressions	10	10	10	10	8	8	8
Regressions × Countries	137	137	137	137	108	108	108

Observations (total)	12,819	12,819	12,819	12,819	9,763	9,763	9,763
R^2: average	0.77	0.51	0.27	0.82	0.77	0.10	0.81
25^{th}	0.69	0.55	0.22	0.85	0.70	0.10	0.76
median	0.86	0.56	0.25	0.93	0.91	0.10	0.93
75^{th}	0.92	0.68	0.49	0.96	0.92	0.11	0.94
Adj. R^2: average	0.77	0.50	0.15	0.79	0.76	0.08	0.77

Table 5
Speed of adjustment of nominal stock prices to firm's IPO prices
This table presents the result of the following regression model of nominal stock prices at the end of June in each year for the period 1992 to 2010:

$$\Delta Nominal\ price_{ft} = \upsilon_c + \gamma_1\left(\beta_1 * IPO\ price_{1f} + \tau_t + \iota_i - Nominal\ price_{1ft-1}\right) \times \upsilon_c + \gamma_2\left(\beta_2 * IPO\ price_{2f} + \tau_t + \iota_i - Nominal\ price_{2ft-1}\right) \times \upsilon_c + \varepsilon_{it}$$

where τ_t and ι_i denote year (time) and industry fixed effects. $IPO\ price_{1f}$ and $Nominal\ price_{1\ ft-1}$ ($IPO\ price_{2f}$ and $Nominal\ price_{2\ ft-1}$) are set to zero when the firm's nominal stock price at t–1 is less than or equal to (greater than) its IPO stock price. If they are not set to zero, then they are set to firm's IPO stock price and nominal stock price, respectively. Local currencies are normalized by converting to USD at the exchange rate that existed on June 30, 2000. These prices are winsorized at 1% and 99% percentiles. All variables, including year and industry dummies, are interacted with country dummies, υ_c. Observations after the introduction of the euro (Jan. 1999) of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. Industry classification is Datastream level 3 group (19 industries) based on FTSE's industry classification benchmark. There are N countries in each regression, and so there are N coefficients, N t–stats, one R–square. The coefficients and t–stats are averaged across the N countries. The table presents the weighted average of these averaged coefficients, averaged t–stats (shown in parenthesis), where the weights are the sample size of each country. The first (second) number inside the square brackets denotes the proportions of coefficients that are positively (negatively) significant at 10% level or less. The t–statistics are based on robust standard errors that are corrected for clustering at the firm level. Standard errors of β_1, and β_2 are derived using the delta method.

Variables	(1)	(2)	(3)	(4)
Interaction of country dummies with				
$Nominal\ price_{ft-1} > IPO\ price_f$				
Speed of adjustment (γ_1)	0.43	0.42	0.44	0.44
	(6.05)	(5.85)	(6.75)	(6.48)
	[0.84,0.03]	[0.81,0.03]	[0.87,0.03]	[0.87,0.03]
IPO price (β_1)	0.84	0.93	0.59	0.74
	(16.21)	(16.62)	(18.78)	(19.36)
	[0.59,0.00]	[0.62,0.03]	[0.62,0.07]	[0.59,0.03]
$Nominal\ price_{ft-1} \leq IPO\ price_f$				
Speed of adjustment (γ_2)	0.23	0.19	0.24	0.16
	(1.41)	(0.89)	(1.88)	(1.33)
	[0.36,0.04]	[0.30,0.07]	[0.46,0.04]	[0.35,0.04]
IPO price (β_2)	2.08	0.81	0.44	0.99
	(4.88)	(3.90)	(1.95)	(1.45)
	[0.32,0.11]	[0.26,0.00]	[0.21,0.04]	[0.26,0.04]
Dummies	Country	Country × Year	Country × Industry	Country × Year Country × Industry

No. of observations	36,258	36,258	36,258	36,258
R^2	0.16	0.23	0.19	0.25

Table 6
Correlations of median nominal price with median total return stock price, equally– and value–weighted total return index

This table shows the correlations of median nominal price with median total return stock price, equally– and value–weighted total return index. Observations after the introduction of the euro (Jan. 1999) of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. The median nominal stock price in year t is the median of the nominal stock prices of the sample firms in year t. The median total return stock price is the median of the adjusted stock prices, where the adjusted stock price reflects the actual total return (growth in the value of a share held over the sample period assuming dividends are reinvested). Equally– and value–weighted total return indices are constructed for each country using firms' adjusted stock prices where value–weighted is weighted by firms' market capitalizations.

Country	No. of firms	Correlations of median nominal price with		
		Median total return price	Equal–weighted index	Value–weighted index
Argentina	80	0.82	0.71	0.58
Australia	1,154	0.98	–0.48	–0.48
Austria	51	0.62	0.06	–0.18
Belgium	110	0.82	0.86	0.83
Brazil	44	–0.18	–0.24	–0.24
Canada	1,351	0.98	–0.02	–0.07
Chile	208	0.91	0.90	0.89
Colombia	51	0.86	0.85	0.87
Denmark	224	–0.15	–0.36	–0.54
Egypt	95	0.42	0.21	0.09
France	437	0.81	–0.26	–0.28
Germany	355	0.58	0.16	–0.08
Greece	71	0.81	0.25	0.29
Hong Kong	736	0.98	–0.35	–0.38
India	1,524	1.00	–0.13	–0.08
Indonesia	264	0.84	–0.39	–0.36
Ireland	53	0.85	0.87	0.85
Israel	559	0.95	–0.20	–0.21
Italy	180	0.64	0.41	0.10
Japan	2,343	0.94	0.51	0.04
Malaysia	721	0.97	0.52	–0.40
Netherlands	177	–0.29	–0.50	–0.46
New Zealand	66	0.71	0.58	0.48
Norway	180	0.54	–0.49	–0.48
Pakistan	301	0.65	0.11	0.08
Peru	126	0.63	0.44	0.42

Philippines	209	0.94	0.09	0.06
Portugal	69	0.86	0.12	–0.29
Singapore	369	0.94	–0.60	–0.64
South Africa	463	0.90	–0.05	–0.08
South Korea	785	0.32	0.00	–0.15
Spain	94	0.63	0.45	0.15
Sweden	325	0.91	–0.55	–0.54
Switzerland	298	0.26	–0.71	–0.77
Thailand	385	0.92	–0.34	–0.39
Turkey	168	–0.31	0.18	–0.14
United Kingdom	2,023	0.81	–0.13	–0.25
United States	2,816	0.91	0.77	0.75

Table 7

Change (increase / decrease) in nominal stock price in local currency due to corporate actions per country

This table presents the number and percentage of nominal stock prices in local currency that change (increase / decrease) due to corporate actions per country for July 1981 to June 2010. The deviation of a firm's nominal price in year t–1 from its IPO price is defined as:

$$Deviation\ (D) = \frac{Price_{t-1} - IPO\ Price}{IPO\ Price}$$

A firm's stock in year t–1 belongs to group 1, 2, or 3 if D is less than –0.5, if D is between –0.5 and 0.5 (inclusive), or if D is greater than 0.5, respectively. Observations after the introduction of the euro (Jan. 1999) of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. Change in nominal stock price due to corporate actions (%) in year t is defined as:

$$Change\ in\ nominal\ stock\ price\ (\%) = \frac{Price_t - Price_{t-1}*(1+total\ return_t)}{Price_{t-1}} \times 100$$

where total return$_t$ is the actual growth in value of a share held from t–1 to t adjusted for all capital distributions including dividends. If it is over 20% (or below –20%), it is assumed there is an increase (decrease) in nominal stock price due to corporate actions such as reverse stock splits (stock splits or large dividend payouts).

Country	No. of firm / year observations			Increase						Decrease					
	By Group (A)			No. by Group (B)			B / A (%)			No. by Group (C)			C / A (%)		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Argentina	27	53	12	0	0	0	0.00	0.00	0.00	0	3	0	0.00	5.66	0.00
Australia	1,694	972	937	120	11	2	7.08	1.13	0.21	44	18	32	2.60	1.85	3.42
Austria	6	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00
Brazil	7	0	4	1	0	0	14.29	0.00	0.00	0	0	1	0.00	0.00	25.00
Canada	312	566	853	16	7	12	5.13	1.24	1.41	2	20	30	0.64	3.53	3.52
Chile	15	16	36	0	0	0	0.00	0.00	0.00	1	0	2	6.67	0.00	5.56
Colombia	0	0	9	0	0	0	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00
Denmark	83	86	56	1	0	0	1.20	0.00	0.00	3	6	5	3.61	6.98	8.93
Egypt	91	89	48	0	0	0	0.00	0.00	0.00	16	16	11	17.58	17.98	22.92
France	64	11	1	0	0	0	0.00	0.00	0.00	5	2	1	7.81	18.18	100.00

Germany	48	28	5	0	0	0	0.00	0.00	0.00	3	4	1	6.25	14.29	20.00
Greece	6	0	0	0	0	0	0.00	0.00	0.00	2	0	0	33.33	0.00	0.00
Hong Kong	2,018	1,338	783	154	15	4	7.63	1.12	0.51	100	75	54	4.96	5.61	6.90
India	1,820	1,226	902	7	2	2	0.38	0.16	0.22	51	46	37	2.80	3.75	4.10
Indonesia	912	228	75	2	0	0	0.22	0.00	0.00	55	48	15	6.03	21.05	20.00
Israel	0	2	8	0	0	0	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00
Italy	4	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00
Japan	2,120	2,100	722	2	0	0	0.09	0.00	0.00	100	121	106	4.72	5.76	14.68
Malaysia	1,574	1,678	852	12	5	0	0.76	0.30	0.00	60	166	145	3.81	9.89	17.02
Netherlands	2	0	0	0	0	0	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00
New Zealand	18	9	23	1	0	0	5.56	0.00	0.00	1	1	2	5.56	11.11	8.70
Norway	79	106	60	7	0	0	8.86	0.00	0.00	5	6	7	6.33	5.66	11.67
Pakistan	156	282	306	0	0	0	0.00	0.00	0.00	9	51	74	5.77	18.09	24.18
Philippines	256	154	108	3	1	1	1.17	0.65	0.93	17	9	7	6.64	5.84	6.48
Portugal	7	0	0	0	0	0	0.00	0.00	0.00	2	0	0	28.57	0.00	0.00
Singapore	718	713	309	7	0	0	0.97	0.00	0.00	43	53	43	5.99	7.43	13.92
South Africa	0	0	14	0	0	0	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00
South Korea	585	435	342	28	2	0	4.79	0.46	0.00	32	39	36	5.47	8.97	10.53
Spain	2	0	0	0	0	0	0.00	0.00	0.00	1	0	0	50.00	0.00	0.00
Sweden	89	106	46	3	0	0	3.37	0.00	0.00	6	3	8	6.74	2.83	17.39
Switzerland	105	58	15	0	0	0	0.00	0.00	0.00	2	3	5	1.90	5.17	33.33
Thailand	1,298	410	121	10	1	0	0.77	0.24	0.00	91	45	23	7.01	10.98	19.01
Turkey	9	0	0	0	0	0	0.00	0.00	0.00	3	0	0	33.33	0.00	0.00
United Kingdom	294	181	229	35	1	2	11.90	0.55	0.87	8	2	14	2.72	1.10	6.11
United States	208	573	849	4	2	0	1.92	0.35	0.00	5	18	144	2.40	3.14	16.96
Total	**14,627**	**11,420**	**7,725**	**413**	**47**	**23**	**2.82**	**0.41**	**0.30**	**667**	**755**	**803**	**4.56**	**6.61**	**10.39**

Table 8

Number and percentage of firms that decrease nominal stock price due to corporate actions every year, partitioned into euro countries and non–euro European countries

This table presents the number and percentage of the firms whose nominal stock prices in local currency decrease due to corporate actions by year for euro (excluding Greece which adopted the euro in Jan. 2001) and non–euro European countries, for firms that had been present during the entire period of July 1998 to June 2010. A (%) and B (%) present the percentage of those firms, out of the total firms in each subgroup, which decrease their nominal stock price by corporate actions. Euro countries are Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Portugal, and Spain (excluding Greece which adopted the euro in Jan. 2001). Non–euro European countries are Denmark, Norway, Sweden, Switzerland, and the U.K. The nominal stock prices are yearly observations at the end of June in each year. Change in nominal stock price due to corporate actions (%) in year t is defined as:

$$\textit{Change in nominal stock price (\%)} = \frac{Price_t - Price_{t-1} * (1 + total\ return_t)}{Price_{t-1}} \times 100$$

where total return$_t$ is the actual growth in value of a share held from t–1 to t adjusted for all capital distributions including dividends. If it is below –20%, it is assumed there is a decrease in nominal stock price due to corporate actions such as stock splits or large dividend payouts. The t–statistics in parentheses are the result of the test of mean equality and are based on the assumption of unequal variances of the two subsamples. ***, **, and * denote statistical significance at 1, 5, and 10% levels, respectively.

Period	Euro countries (1,068 firms)		Non–euro European countries (1,037 firms)		A – B (%p)
	No. of firms decreasing	A (%)	No. of firms decreasing	B (%)	
1998.7 ~ 1999.6	117	11.0	58	5.6	5.4 (4.49)***
1999.7 ~ 2000.6	162	15.2	76	7.3	7.9 (5.75)***
2000.7 ~ 2001.6	87	8.1	67	6.5	1.6 (1.49)
2001.7 ~ 2002.6	48	4.5	35	3.4	1.1 (1.32)
2002.7 ~ 2003.6	42	3.9	32	3.1	0.8 (1.06)
2003.7 ~ 2004.6	53	5.0	51	4.9	0.1 (0.05)
2004.7 ~ 2005.6	59	5.5	53	5.1	0.4 (0.42)
2005.7 ~ 2006.6	69	6.5	70	6.8	–0.3 (–0.27)
2006.7 ~ 2007.6	84	7.9	63	6.1	1.8 (1.61)
2007.7 ~ 2008.6	44	4.1	37	3.6	0.5 (0.66)
2008.7 ~ 2009.6	29	2.7	26	2.5	0.2 (0.30)
2009.7 ~ 2010.6	25	2.3	43	4.1	–1.8 (–2.34)**

Table 9

Number and percentage of euro firms that decrease nominal stock price due to corporate actions every year, partitioned into tercile groups

This table presents the number and percentage of firms whose nominal stock prices decrease due to corporate actions by year for euro countries for firms that had been present during the entire period of July 1998 to June 2010. All these 1,068 firms are partitioned with respect to the level of nominal stock prices in 1998 (right before the euro introduction) into tercile groups, where tercile group 1 has the lowest nominal price level and tercile group 3 the highest. A (%), B (%), and C (%) present the percentage of those firms, out of the total firms in each tercile group, which decrease their nominal stock price by corporate actions. Euro countries are Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Portugal, and Spain (excluding Greece which adopted the euro in Jan. 2001). The nominal stock prices are yearly observations at the end of June in each year. Change in nominal stock price due to corporate actions (%) in year t is defined as:

$$\textit{Change in nominal stock price (\%)} = \frac{Price_t - Price_{t-1}*(1+total\ return_t)}{Price_{t-1}} \times 100$$

where total return$_t$ is the actual growth in value of a share held from t–1 to t adjusted for all capital distributions including dividends. If it is below –20%, it is assumed there is a decrease in nominal stock price due to corporate actions such as stock splits or large dividend payouts. The t–statistics in parentheses are the result of the test of mean equality between subgroups and are based on the assumption of unequal variances of the two subsamples. ***, **, and * denote statistical significance at 1, 5, and 10% levels, respectively.

Period	Tercile 1 (356 firms)		Tercile 2 (356 firms)		Tercile 3 (356 firms)		C–A(%p)	C–B(%p)	B–A(%p)
	No. of firms decreasing	A (%)	No. of Firms decreasing	B (%)	No. of firms decreasing	C (%)			
1998.7 ~ 1999.6	18	5.1	32	9.0	67	18.8	13.8 (5.79)***	9.8 (3.82)***	3.9 (2.06)**
1999.7 ~ 2000.6	25	7.0	46	12.9	91	25.6	18.5 (6.91)***	12.6 (4.32)***	5.9 (2.64)***
2000.7 ~ 2001.6	20	5.6	15	4.2	52	14.6	9.0 (4.02)***	10.4 (4.81)***	–1.4 (–0.87)
2001.7 ~ 2002.6	8	2.2	19	5.3	21	5.9	3.7 (2.47)**	0.6 (0.33)	3.1 (2.16)**
2002.7 ~ 2003.6	11	3.1	17	4.8	14	3.9	0.8 (0.61)	–0.8 (–0.55)	1.7 (1.15)
2003.7 ~ 2004.6	18	5.1	20	5.6	15	4.2	–0.8 (–0.53)	–1.4 (–0.87)	0.6 (0.33)
2004.7 ~ 2005.6	17	4.8	22	6.2	20	5.6	0.8 (0.51)	–0.6 (–0.32)	1.4 (0.82)
2005.7 ~ 2006.6	20	5.6	26	7.3	23	6.5	0.8 (0.47)	–0.8 (–0.44)	1.7 (0.91)
2006.7 ~ 2007.6	32	9.0	36	10.1	16	4.5	–4.5 (–2.40)**	–5.6 (–2.89)***	1.1 (0.51)
2007.7 ~ 2008.6	10	2.8	17	4.8	17	4.8	2.0 (1.37)	0.0 (0.00)	2.0 (1.37)
2008.7 ~ 2009.6	6	1.7	12	3.4	11	3.1	1.4 (1.23)	–0.3 (–0.21)	1.7 (1.43)
2009.7 ~ 2010.6	11	3.1	7	2.0	7	2.0	–1.1 (–0.95)	0.0 (0.00)	–1.1 (–0.95)

Internet Appendix

Table 1A

Cross–section regressions of nominal stock prices on firm's initial prices

This table presents the result of T cross–section regressions. The dependent variable is a firm's nominal stock price in "normalized" local currency at the end of June in year t (t=1992, 1993,...2010; so T=19). The independent variables are the firm's price in "normalized" local currency when it first entered the panel, the firm's log market capitalization in "normalized" local currency at time t–1, and the firm's institutional ownership at time t–1. All three independent variables and industry dummies are interacted with country dummies. Log (market value of equity) is the natural logarithm of a firm's share price multiplied by its number of shares outstanding. Institutional ownership is strategic ownership collected from Datastream, which defines it as the proportion of shares exceeding 5% of total shares outstanding held by institutional investors such as pension funds and investment companies among all shares outstanding (%). Local currencies are normalized by converting to USD at the exchange rate that existed on June 30, 2000. Industry classification is Datastream level 3 group (19 industries) based on FTSE's industry classification benchmark. Observations of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. The coefficients and t–statistics are based on White heteroscedasticity–corrected standard errors. There are N countries in each of the T regressions, and so there are N coefficients, N t–stats, one R–square and one adjusted R–square per regression. The coefficients and t–stats are averaged across the N countries. The table below shows the weighted average of these averaged coefficients, averaged t–stats (shown in parenthesis), R–squares, and adjusted R–squares across T regressions, where the weights are the sample size of each of these T regressions. The 25th, 50th and 75th percentile of the R–squares are also shown. The first (second) number inside the square brackets denotes the proportions of coefficients that are positively (negatively) significant at 10% level or less. All continuous variables are winsorized at 1% and 99% percentiles.

Variables	Panel A: All sample						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Interaction of country dummies with							
IPO price	0.61			0.54	0.52		0.37
	(11.27)			(10.29)	(5.05)		(3.53)
	[0.78,0.01]			[0.78,0.00]	[0.57,0.03]		[0.56,0.03]
Log (market value of equity)		13.17		8.11			2.82
		(4.15)		(2.30)			(3.54)
		[0.67,0.04]		[0.57,0.04]			[0.72,0.04]
Institutional ownership						0.04	0.00
						(0.11)	(0.28)
						[0.18,0.19]	[0.17,0.08]
Dummies	Country	Country	Country × Industry	Country × Industry	Country	Country	Country × Industry
Number of							
Regressions	29	29	29	29	8	8	8
Regressions × countries	770	770	770	770	210	210	210

Observations (total)	322,089	322,089	322,089	322,089	82,069	82,069	82,069
R^2: average	0.71	0.48	0.55	0.76	0.58	0.25	0.65
25^{th}	0.68	0.30	0.37	0.73	0.47	0.22	0.55
median	0.72	0.56	0.63	0.77	0.62	0.24	0.69
75^{th}	0.83	0.71	0.75	0.86	0.68	0.27	0.74
Adj. R^2: average	0.71	0.48	0.53	0.75	0.58	0.24	0.64
Variables	Panel B: Sample of nominal prices that are 10 or more years away from the IPO price						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IPO price	0.63 (4.99) [0.71,0.02]			0.51 (4.15) [0.67,0.01]	0.60 (4.41) [0.58,0.04]		0.38 (2.49) [0.55,0.05]
Log (market value of equity)		5.23 (3.35) [0.72,0.05]		4.78 (2.70) [0.66,0.03]			2.42 (2.88) [0.67,0.05]
Institutional ownership						0.01 (0.02) [0.11,0.17]	–0.02 (0.29) [0.15,0.07]
Dummies	Country	Country	Country × Industry	Country × Industry	Country	Country	Country × Industry
Number of							
Regressions	20	20	20	20	8	8	8
Regressions × Countries	428	428	428	428	193	193	193
Observations (total)	142,979	142,979	142,979	142,979	63,189	63,189	63,189
R^2: average	0.59	0.47	0.54	0.67	0.46	0.33	0.57
25^{th}	0.53	0.38	0.45	0.62	0.42	0.29	0.53
median	0.66	0.58	0.66	0.73	0.48	0.35	0.58
75^{th}	0.74	0.66	0.72	0.79	0.49	0.37	0.59
Adj. R^2: average	0.59	0.47	0.52	0.65	0.46	0.33	0.54

Table 2A

Cross–section regressions of nominal stock prices on firm's initial prices without the U.S.

This table presents the result of T cross–section regressions. The dependent variable is a non–US firm's nominal stock price in "normalized" local currency at the end of June in year t (t=1992, 1993,...2010; so T=19). The independent variables are the firm's initial price in "normalized" local currency when it first entered the panel, the firm's log market capitalization in "normalized" local currency at time t–1, and the firm's institutional ownership at time t–1. All three independent variables and industry dummies are interacted with country dummies. Log (market value of equity) is the natural logarithm of a firm's share price multiplied by its number of shares outstanding. Institutional ownership is strategic ownership collected from Datastream, which defines it as the proportion of shares exceeding 5% of total shares outstanding held by institutional investors such as pension funds and investment companies among all shares outstanding (%). Local currencies are normalized by converting to USD at the exchange rate that existed on June 30, 2000. Industry classification is Datastream level 3 group (19 industries) based on FTSE's industry classification benchmark. Observations of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. The coefficients and t–statistics are based on White heteroscedasticity–corrected standard errors. There are N countries in each of the T regressions, and so there are N coefficients, N t–stats, one R–square and one adjusted R–square per regression. The coefficients and t–stats are averaged across the N countries. The table below shows the weighted average of these averaged coefficients, averaged t–stats (shown in parenthesis), R–squares, and adjusted R–squares across T regressions, where the weights are the sample size of each of these T regressions. The 25th, 50th and 75th percentile of the R–squares are also shown. The first (second) number inside the square brackets denotes the proportions of coefficients that are positively (negatively) significant at 10% level or less. All continuous variables are winsorized at 1% and 99% percentiles.

Variables	Panel A: All sample						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Interaction of country dummies with							
IPO price	0.58			0.52	0.51		0.35
	(11.60)			(10.61)	(5.09)		(3.54)
	[0.76,0.01]			[0.76,0.00]	[0.55,0.03]		[0.54,0.03]
Log (market value of equity)		12.98		8.40			2.90
		(4.01)		(2.29)			(3.54)
		[0.66,0.04]		[0.57,0.04]			[0.71,0.04]
Institutional ownership						0.09	–0.01
						(0.17)	(0.21)
						[0.17,0.19]	[0.17,0.08]
Dummies	Country	Country	Country × Industry	Country × Industry	Country	Country	Country × Industry
Number of							
Regressions	29	29	29	29	8	8	8
Regressions × countries	741	741	741	741	202	202	202
Observations (total)	273,280	273,280	273,280	273,280	71,624	71,624	71,624

R^2: average	0.71	0.46	0.54	0.76	0.59	0.23	0.66
25th	0.67	0.29	0.36	0.73	0.47	0.21	0.55
median	0.73	0.56	0.64	0.77	0.62	0.23	0.70
75th	0.84	0.71	0.76	0.86	0.69	0.25	0.75
Adj. R^2: average	0.71	0.46	0.51	0.74	0.58	0.23	0.64

Variables	Panel B: Sample of nominal prices that are 10 or more years away from the IPO price						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IPO price	0.61 (5.02) [0.69,0.02]			0.49 (4.18) [0.65,0.01]	0.59 (4.43) [0.56,0.05]		0.36 (2.46) [0.52,0.05]
Log (market value of equity)		5.31 (3.19) [0.71,0.06]		4.90 (2.70) [0.65,0.03]			2.50 (2.89) [0.66,0.05]
Institutional ownership						0.02 (0.02) [0.10,0.16]	–0.03 (0.23) [0.14,0.08]
Dummies	Country	Country	Country × Industry	Country × Industry	Country	Country	Country × Industry
Number of							
Regressions	20	20	20	20	8	8	8
Regressions × Countries	408	408	408	408	185	185	185
Observations (total)	119,514	119,514	119,514	119,514	54,387	54,387	54,387
R^2: average	0.58	0.46	0.54	0.67	0.45	0.32	0.57
25th	0.52	0.37	0.45	0.62	0.40	0.27	0.53
median	0.66	0.58	0.66	0.74	0.47	0.33	0.58
75th	0.74	0.67	0.73	0.79	0.48	0.36	0.60
Adj. R^2: average	0.58	0.46	0.51	0.65	0.45	0.31	0.54

Table 3A
Speed of adjustment of nominal stock prices to firm's initial prices
This table presents the result of the following regression model of nominal stock prices at the end of June in each year for the period 1982 to 2010:

$$\Delta Nominal\ price_{ft} = \upsilon_c + \gamma_1\left(\beta_1 * Initial\ price_{1f} + \tau_t + \iota_i - Nominal\ price_{1ft-1}\right) \times \upsilon_c + \gamma_2\left(\beta_2 * Initial\ price_{2f} + \tau_t + \iota_i - Nominal\ price_{2ft-1}\right) \times \upsilon_c + \varepsilon_{it}$$

where τ_t and ι_i denote year (time) and industry fixed effects. A firm's *initial price* is the price of its stock when it first entered the panel. *Initial price*$_{1f}$ and *Nominal price*$_{1\,ft-1}$ (*Initial price*$_{2f}$ and *Nominal price*$_{2\,ft-1}$) are set to zero when the firm's nominal stock price at t–1 is less than or equal to (greater than) its initial stock price. If they are not set to zero, then they are set to firm's initial stock price and nominal stock price, respectively. Local currencies are normalized by converting to USD at the exchange rate that existed on June 30, 2000. These prices are winsorized at 1% and 99% percentiles. All variables, including year and industry dummies, are interacted with country dummies, υ_c. Observations after the introduction of the euro (Jan. 1999) of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. Industry classification is Datastream level 3 group (19 industries) based on FTSE's industry classification benchmark. There are N countries in each regression, and so there are N coefficients, N t–stats, one R–square. The coefficients and t–stats are averaged across the N countries. The table below shows the weighted average of these averaged coefficients, averaged t–stats (shown in parenthesis) in each regression, where the weights are the sample size of each country. The first (second) number inside the square brackets denotes the proportions of coefficients that are positively (negatively) significant at 10% level or less. The t–statistics are based on robust standard errors that are corrected for clustering at the firm level. Standard errors of β_1, and β_2 are derived using the delta method.

Variables	(1)	(2)	(3)	(4)
Interaction of country dummies with				
$Nominal\ price_{ft-1} > Initial\ price_f$				
Speed of adjustment (γ_1)	0.14 (3.06) [0.61,0.00]	0.13 (2.98) [0.58,0.00]	014 (3.26) [0.63,0.00]	0.14 (3.19) [0.63,0.00]
Initial Stock price (β_1)	0.15 (1.79) [0.63,0.00]	0.45 (1.78) [0.61,0.00]	0.34 (1.71) [0.58,0.00]	0.40 (1.71) [0.61,0.00]
$Nominal\ price_{ft-1} \leq Initial\ price_f$				
Speed of adjustment (γ_2)	0.01 (0.86) [0.37,0.08]	0.01 (0.04) [0.39,0.05]	0.02 (0.97) [0.37,0.05]	0.00 (–0.10) [0.37,0.03]
Initial Stock price (β_2)	0.45 (1.36) [0.34,0.03]	1.39 (0.72) [0.24,0.03]	0.25 (1.38) [0.32,0.00]	2.94 (0.80) [0.26,0.00]
Dummies	Country	Country × Year	Country × Industry	Country × Year Country × Industry
No. of observations	318,181	318,181	318,181	318,181
R^2	0.07	0.15	0.08	0.16

Table 4A

Change (increase / decrease) in nominal stock price in local currency due to corporate actions per country

This table presents the number and percentage of nominal stock prices in local currency that change (increase / decrease) due to corporate actions per country for July 1981 to June 2010. The deviation of a firm's nominal price in year t–1 from its initial price (initial price is the nominal price of a firm when it first enters the panel) is defined as:

$$Deviation\ (D) = \frac{Price_{t-1} - Inital\ Price}{Initial\ Price}$$

A firm's stock in year t–1 belongs to group 1, 2, or 3 if D is less than –0.5, if D is between –0.5 and 0.5 (inclusive), or if D is greater than 0.5, respectively. To be included in the sample, firms are required to have at least 10 consecutive yearly observations. Observations after the introduction of the euro (Jan. 1999) of euro countries (Austria, Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain) and after currency devaluation of Turkish lira (Jan. 2005) are excluded. The nominal stock prices are yearly observations at the end of June in each year for 1981 ~ 2010. Change in nominal stock price due to corporate actions (%) in year t is defined as:

$$Change\ in\ nominal\ stock\ price\ (\%) = \frac{Price_t - Price_{t-1}*(1+total\ return_t)}{Price_{t-1}} \times 100$$

where total return$_t$ is the actual growth in value of a share held from t–1 to t adjusted for all capital distributions including dividends. If it is over 20% (or below –20%), it is assumed there is an increase (decrease) in nominal stock price due to corporate actions such as reverse stock splits (stock splits or large dividend payouts).

Country	No. of firm/year observations			Increase						Decrease					
	By Group (A)			No. by Group (B)			B / A (%)			No. by Group (C)			C / A (%)		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Argentina	354	460	245	4	6	0	1.13	1.30	0.00	27	48	32	7.63	10.43	13.06
Australia	5,353	5,600	5,029	364	98	25	6.80	1.75	0.50	173	186	200	3.23	3.32	3.98
Austria	94	278	139	2	2	0	2.13	0.72	0.00	2	24	15	2.13	8.63	10.79
Belgium	119	457	742	1	0	1	0.84	0.00	0.13	0	9	28	0.00	1.97	3.77
Brazil	203	114	226	3	2	1	1.48	1.75	0.44	19	25	50	9.36	21.93	22.12
Canada	5,119	7,257	6,986	255	107	77	4.98	1.47	1.10	111	209	395	2.17	2.88	5.65
Chile	522	712	2,074	5	1	2	0.96	0.14	0.10	40	39	84	7.66	5.48	4.05
Colombia	124	251	243	2	0	0	1.61	0.00	0.00	11	7	10	8.87	2.79	4.12
Denmark	1,061	1,678	875	2	11	0	0.19	0.66	0.00	52	93	127	4.90	5.54	14.51
Egypt	516	375	129	2	0	0	0.39	0.00	0.00	104	67	26	20.16	17.87	20.16
France	696	2,076	1,826	3	2	1	0.43	0.10	0.05	27	162	169	3.88	7.80	9.26
Germany	308	2,015	1,789	6	7	0	1.95	0.35	0.00	24	79	123	7.79	3.92	6.88

Greece	109	264	261	0	1	0	0.00	0.38	0.00	12	58	54	11.01	21.97	20.69
Hong Kong	5,244	3,764	2,517	336	55	18	6.41	1.46	0.72	257	315	210	4.90	8.37	8.34
India	11,274	6,133	3,272	30	11	1	0.27	0.18	0.03	270	227	186	2.39	3.70	5.68
Indonesia	2,671	896	302	21	1	0	0.79	0.11	0.00	233	188	59	8.72	20.98	19.54
Ireland	83	262	192	2	1	0	2.41	0.38	0.00	2	16	15	2.41	6.11	7.81
Israel	3,169	2,989	2,421	33	3	3	1.04	0.10	0.12	110	165	105	3.47	5.52	4.34
Italy	648	1,075	427	10	6	2	1.54	0.56	0.47	51	101	47	7.87	9.40	11.01
Japan	13,097	19,276	14,531	36	18	3	0.27	0.09	0.02	182	372	214	1.39	1.93	1.47
Malaysia	4,464	3,649	3,054	53	11	4	1.19	0.30	0.13	222	319	358	4.97	8.74	11.72
Netherlands	452	962	927	1	0	1	0.22	0.00	0.11	10	56	127	2.21	5.82	13.70
New Zealand	124	337	180	10	2	2	8.06	0.59	1.11	8	16	9	6.45	4.75	5.00
Norway	948	998	555	18	2	0	1.90	0.20	0.00	67	85	92	7.07	8.52	16.58
Pakistan	1,168	1,605	1,145	4	2	1	0.34	0.12	0.09	113	203	202	9.67	12.65	17.64
Peru	557	603	486	4	0	1	0.72	0.00	0.21	74	98	97	13.29	16.25	19.96
Philippines	1,265	983	910	28	36	31	2.21	3.66	3.41	84	104	79	6.64	10.58	8.68
Portugal	362	231	16	1	0	0	0.28	0.00	0.00	28	24	3	7.73	10.39	18.75
Singapore	2,078	2,575	928	18	1	2	0.87	0.04	0.22	133	217	98	6.40	8.43	10.56
South Africa	1,482	2,019	2,848	43	6	3	2.90	0.30	0.11	88	156	187	5.94	7.73	6.57
South Korea	4,058	4,390	5,178	247	33	12	6.09	0.75	0.23	257	377	420	6.33	8.59	8.11
Spain	313	406	151	1	4	1	0.32	0.99	0.66	15	30	9	4.79	7.39	5.96
Sweden	1,713	1,553	900	50	14	0	2.92	0.90	0.00	103	150	170	6.01	9.66	18.89
Switzerland	1,920	2,151	940	4	0	0	0.21	0.00	0.00	100	117	106	5.21	5.44	11.28
Thailand	4,476	1,266	373	31	4	2	0.69	0.32	0.54	299	181	59	6.68	14.30	15.82
Turkey	387	460	833	1	0	2	0.26	0.00	0.24	161	247	432	41.60	53.70	51.86
United Kingdom	7,118	11,397	13,304	279	46	30	3.92	0.40	0.23	172	418	865	2.42	3.67	6.50
United States	6,716	23,909	15,222	125	49	15	1.86	0.20	0.10	128	1,726	2,465	1.91	7.22	16.19
Total	**90,365**	**115,426**	**92,176**	**2,035**	**542**	**241**	**2.25**	**0.47**	**0.26**	**3,769**	**6,914**	**7,927**	**4.17**	**5.99**	**8.60**