IPO Underpricing and Information Asymmetry in an Emerging Market Country

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Abstract

Underpricing (measured using first-day returns) in initial public offerings of Turkish firms average 14 percent. Underpricing is larger in IPO firms that listed in the years immediately following the inauguration of Borsa Istanbul and in IPOs in which the offer price is not fixed but moves in a predetermined range of prices according to the information revealed in the book-building process. Information asymmetry about the IPO firm and volatility in the macro-economy seem to affect both the level of underpricing and the method through which IPO is priced and marketed. Underpricing is also significantly higher in IPOs where majority shareholders sell when compared to IPOs in which the firm issues new shares and raises capital.

\textit{JEL codes:} G15, G32
\textit{Keywords:} IPO; Emerging market country; Turkey.

I. Introduction

This paper investigates first-day through first-month underpricing in Turkish initial public offerings (IPOs). Our sample is comprehensive covering 459 firms (80 percent of all IPOs) listed in the Turkish stock exchange, Borsa Istanbul, from its inception in 1986 and extending through to 2017. Underpricing (first-day returns) in Turkish IPOs average 14 percent. When we increase the window in which we measure underpricing from one-day to one-month, underpricing averages 20 percent in the 1-week, 24 percent in the 1 and 2-week, and 25 percent in the one-month window. There is great cross-country variation in underpricing. Ritter (2003) calculates first-day returns for IPOs in USA as 18 percent. First-day returns in emerging markets that are more appropriate benchmarks for Turkey are: 79 percent in Brazil (Aggarwal \emph{et. al.}, 1993); 9 percent in Chile.
(Aggarwal et. al., 1993, Celis and Maturana, 1998); 35 percent in India (Krishnamurti and Kumar, 2002). The underpricing of 14 percent in Turkish IPOs are within the lower range of underpricing documented in other emerging market countries.

Beatty and Ritter (1985), Rock (1986), Allen and Faulhaber (1989), Welch (1989), Chemmanur (1993) and Chemmanur and Fulghieri (1994) develop theoretical models that rely on information asymmetries to explain IPO underpricing. The information asymmetry may be between firm insiders and investors (Welch, 1989; Allen and Faulhaber, 1989; Chemmanur, 1993), between investment banks and investors (In Beatty and Ritter, 1986; Chemmanur and Fulghieri, 1994), between informed and uninformed investors (Rock, 1986). Turkey as an emerging market country and Borsa Istanbul as a relatively young stock market is especially prone to information asymmetries between firm insiders and investors, and between informed and uninformed investors.

Turkey initiated a financial liberalization program that structurally changed the Turkish economy in the early 1980s. Borsa Istanbul (or as it was then known, The Istanbul Stock Exchange) was established in 1986 as a part of the financial liberalization program. The fifteen years from 1986 to 2001 proved volatile for both Borsa Istanbul and the Turkish economy. Balaban and Kunter (1997), Antoniou et.al. (1997) discuss how price inefficiencies resulting from lack of investor participation and thin trading in the early years of Borsa Istanbul improve with higher trading volume and structural reforms in institutional framework. We find that underpricing (using the first-week returns) in IPOs announced before 2001 averages 23 percent and in IPOs announced after 2001 14 percent. Cai et al. (2017) show that investors learn from their prior trading experience.

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1 Eighty firms with a total market capitalization of 657 million USD traded in Borsa Istanbul at its inception in 1986. As of 2016, 405 firms are trading in the national market with a market capitalization of 172 billion USD. ISE is the 8th largest stock market in Europe in terms of market capitalization. Statistics available from World Federation of Exchanges at https://www.world-exchanges.org/home/index.php/statistics/annual-statistics.
in Chinese IPOs. We also think the larger underpricing in Turkish IPOs before 2000 may be attributed to learning and the more pronounced information asymmetries inherent in the early years of Borsa Istanbul.

One strand of the literature focuses on how information asymmetries may affect the marketing and pricing method of IPOs. Benveniste and Spindt (1989), Benveniste and Wilhelm (1990), Spatt and Srivastava (1991), Sherman (2005) and Busaba and Chang (2010) explain underpricing as a by-product of the marketing process of IPOs where investors are compensated (via lower offer prices) for truthfully revealing their preferences. Basuba and Chang (2010) show that when there is aftermarket trading, a fixed offer price produces less underpricing relative to a book-building process. In line with the predictions of Basuba and Chang, underpricing in Turkish IPOs which are priced and marketed using a fixed offer price proves significantly smaller at 7 percent relative to underpricing of 11 percent in IPOs that allow offer prices to move in a pre-determined price range according to the information revealed in the book-building process. Information asymmetry about the IPO firm and the volatility in the Turkish economy seem to affect both the level of underpricing and the method through which IPO is priced and marketed.

Jensen and Meckling (1976) show how firm value decreases when owner/manager sells shares to outsiders. Decreasing the ownership stake of the majority shareholder while increasing the ownership stake of the minority shareholders would intensify incentive conflicts between the insider manager and outside investors. We find that underpricing proves significantly higher in IPOs where majority shareholders sell stock when compared to IPOs in which the firm issues new shares and raises capital. Investors who anticipate the increase in agency costs arising from incentive conflicts between the controlling, majority shareholder and minority shareholders seem to be demanding larger discounts in IPOs in which majority shareholders are selling their shares.
Our findings of larger underpricing in IPO firms that are more prone to information asymmetry and agency costs are in line with the findings of Banerjee et al. (2011) and Akyol et al. (2014) who report that cross-country and time-series differences in information asymmetry and agency costs affect underpricing, respectively.

II. Sampling Frame

We compile the first-trading day of Turkish IPOs using Borsa Istanbul IPO list. This list covers 574 IPO firms (excluding IPOs of exchange traded funds) with first trading dates ranging from 3 January 1986 to 15 June 2017. We pull data on the specifics of the deals (such as the offer price, the float rate, the underwriting method, the pricing mechanism, the IPO proceeds) and from Finans Yatırım, Borsa Istanbul, Bloomberg and Datastream databases. We also require sample firms to have offer price and post-IPO share prices on DataStream or Bloomberg databases. Our final sample covers 459 firms for which share price data is available. Figure 1 plots annual IPO volume using the full sample of IPO firms and the subsample of IPO firms for which share price data is available.

The sample covers less IPOs in the first four years of Borsa Istanbul since share price is available for only 21 out of the 98 IPO firms. The IPO sub-sample with share price data is comprehensive and covers 92 percent of all IPO deals after 1989. Figure 1 show that the number of firms undertaking IPOs is pro-cyclical with the number of IPOs bottoming in the crisis years of 2001-2002 and 2008-2009.

The average sample firm sold 22 percent of shares outstanding and generated proceeds of 49 million USD in its IPO. 24 percent of IPO firms eventually delisted; of the delisted 75 percent

\footnote{Data on first trading and delisting dates for IPO firms is available from ISE at \url{http://www.imkb.gov.tr/Data/StocksData.aspx}.}
went bankrupt and 31 percent were acquired. There also exists variation in how investment bankers are compensated, the shares being offered for sale, and how Turkish IPOs are priced and marketed. In 79 percent of deals underwriters purchase the issue directly from the IPO firm and assume the risk of insufficient demand from the public. In 41 percent of the deals IPO firm raises new capital and the proceeds accrue to the firm whereas in the rest of the deals at least some proportion of the proceeds accrue to pre-IPO shareholders from the sale of their existing shares. The offer price is fixed in 60 percent of IPOs and varies in a pre-determined range in the remaining 40 percent.

III. Results

Table 2 describes 1st day, and 1st through 4th week returns. 1st-day (n-week) return is defined as first-day (n th week) closing price minus offer price divided by the offer price. Underpricing (first-day returns) in Turkish IPOs average 14 percent. When we increase the window in which we measure underpricing, the one through four week returns range from 20 to 25 percent. Figure 2 plots the same data on mean, median, 25th and 75th percentile of returns in time horizons ranging from 1 to 20 trading days after the first trading day. The descriptive statistics and the figure reveal that first-day through first-month returns are right-skewed.

There is great variation in first-day returns across countries (Ritter, 2006). Ritter (2003) calculates first-day returns for IPOs (sample period 1980 to 2012) in USA as 18 percent. First-day returns in emerging markets that are more appropriate benchmarks for Turkey are: 79 percent in Brazil (sample period 1979-1990, Aggarwal et al., 1993); 9 percent in Chile (sample period 1982-1997, Aggarwal et al., 1993, Celis and Maturana, 1998); 35 percent in India (sample period 1992-

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3 We fail to compile all deal terms in our sample of 459 IPO firms. The most problematic deal term is the method through which investment bankers are compensated where in 35 percent of the deals we cannot find information on the type of compensation used. The reported averages in the text are calculated using the available sample size for each deal term.
1993, Krishnamurti and Kumar, 2002). Krymaz (2000), Güner et al. (1999), Durukan (2002), Küçükkocaoğlu (2008), Ünlü and Ersan (2008) find that underpricing in Turkish IPOs range from 7 to 15 percent in different sub-periods ranging from 1990 to 2008. This paper compiles the most comprehensive list of Turkish IPOs covering the period from 1986 to 2017 for 459 IPOs. The underpricing measured in first-day returns average 14 percent are within the lower range of underpricing documented in other emerging market countries.

Figure 3 plots underpricing (first-day returns) across industries and the business cycle. Underpricing proves largest at 29 percent in 2009 and at 23 percent in the first 7 years after Borsa Istanbul started operations. The large underpricing in 2009 is due to the dearth of IPOs (only 2) in the crisis year whereas the underpricing in the early years of Borsa Istanbul may be tied to the information asymmetry inherent in the young exchange and the volatility in the Turkish economy.

Turkey pursued a domestic market-oriented, high-tariff-protected, import substitution growth strategy before 1980. Following the military coup in 1980, the newly elected executive officials adopted a new export-led growth strategy based on “free market” notions of competition (Cecen, 1994; Selçuk and Ertugrul, 2001; Tanyeri, 2010) which included the opening of a stock exchange, Borsa Istanbul. The early years of deregulation from 1986 (establishment of Borsa Istanbul) to 2001 proved volatile both politically, with 14 coalitions ruling and, economically with three significant economic crises, in 1988, 1994 and 1999-2001 (Kibritçioğlu, 2001). There is also considerable variation in underpricing across industries. Firms in retail and whole-sale industries had the largest underpricing of 24 percent and firms in miscellaneous industries the smallest underpricing of 6 percent.

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4 Industry classification is from Bloomberg and Finans Yatirim. We classify the business cycles using Kibritçioğlu (2001) categorization and Turkish GDP growth rates.
Starting with Beatty and Ritter (1985) and Jensen and Meckling (1976), information asymmetry and agency costs, respectively, have been used to explain IPO underpricing. Benveniste and Spindt (1989), Benveniste and Wilhelm (1990), Spatt and Srivastava (1991), Sherman (2005), and Busaba and Chang (2010) explain underpricing as a by-product of the book-building process where investors are compensated (via lower offer prices) for truthfully revealing their preferences. Jensen and Meckling (1976) show how firm value decreases when owner/manager sells shares to outsiders. Decreasing the equity stake of the majority shareholder while increasing the stake of the minority shareholders would intensify the incentive conflicts between the insider manager and outside investors. Outside investors who anticipate the increase in the self-serving actions of the owner/manager would value the firm accordingly and demand larger discounts.

Table 2 investigates whether underpricing (measured using first-day to first-month returns) differs according to the pricing and marketing method used in Turkish IPOs differ in subsamples classified according to proxies for information asymmetry and agency costs. The subsamples are classified according to: whether the underwriter signed on for best effort versus firm commitment underwriting contract; whether the investment bankers fixed the offer price prior to the book-building process; whether the IPO took place prior to 2001; whether existing shareholders sold any portion of their stake in the IPO. Underpricing proves significantly lower: in IPOs where the underwriters signed on for firm commitment and assumed the risk of not selling the full offering; in IPOs where the offer price was fixed before the book-building process; and in IPO firms that listed after 2000. IPOs where the investment banker was willing to assume the risk of insufficient demand and fixed the offer price prior to book-building process are firms that are prone to less

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5 Huang et al. (2017) also find underpricing to be significantly higher in Taiwanese IPOs in which the offer price was fixed relative to IPOs in which the offer price was determined in the book-building process.
information asymmetry. Furthermore, the Turkish economy was less volatile and Borsa Istanbul more established after 2000. As such, these IPO firms that were less prone to information asymmetries did not need to underprice as heavily. Finally, underpricing (measured using first day returns) in IPOs in which existing shareholders offered stock up for sale proved significantly larger. IPO investors anticipating agency costs arising from the increased incentive conflicts from majority shareholders demanded larger discounts when existing shareholders chose to sell their shares.

Table 3 runs regressions of first-day, first-week, and first-month returns on contracting terms which may affect the level of IPO underpricing. As in univariate results, underwriters signing on for firm commitment, the offer price being fixed before the book-building process, listing after 2000 all decrease (albeit insignificantly in some specifications) underpricing. Furthermore, underpricing is decreasing in IPO size (as measure in IPO proceeds) confirming that larger IPOs that are prone to less information asymmetry can get away with smaller price discounts.

IV. Conclusion

Underpricing (first-day returns) in 459 Turkish firms that listed on Borsa Istanbul from its inception in 1986 to 2017 average 14 percent. The underpricing of 14 percent is within the lower range of underpricing documented in other emerging market countries. Turkey as an emerging market country and Borsa Istanbul as a relatively young stock market is prone to information asymmetries between firm insiders and investors, and between informed and uninformed investors. Underpricing proves significantly lower in IPOs where information asymmetry is less pronounced such as larger IPOs where the underwriters signed on for firm commitment and assumed the risk of not selling the full offering, where the offer price was fixed before the book-building process, and that listed after 2000. Finally, underpricing in IPOs in which existing shareholders offered stock up for sale proved significantly larger. IPO investors anticipating agency costs arising from
the increased incentive conflicts from majority shareholders and the new minority investors
demanded larger discounts when existing shareholders chose to sell their shares.

**Figure 1 – IPO volume**

Figure plots the number of firms that listed on Borsa Istanbul each year in the full sample and in
the subsample of firms for which we can calculate first-day returns.

**Figure 2 – Cumulative returns in the 1 to 20 trading day horizons.**

Figure 2 plots the mean, median, 25th and 75th percentile of cumulative returns in time horizons
ranging from 1 to 20 trading days after the first trading day.
Figure 3 – Underpricing across industries and the business cycle

Panel A and B report first-day returns (subtracts first-day closing price from offer price divided by offer price) across different industries and the business cycle, respectively. The number of IPOs in each period and industry is denoted with N.
Table 1 – Underpricing in Turkish IPOs

Table reports mean, median, minimum, maximum, 25th, 75th percentile, and the percent of positive returns in different horizons. 1st day, and 1st through 4th week returns calculated by subtracting first-day (or nth week) closing price from offer price divided by the offer price.

<table>
<thead>
<tr>
<th>Returns</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>25th percentile</th>
<th>Median</th>
<th>75th percentile</th>
<th>Maximum</th>
<th>% positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st day</td>
<td>13.9</td>
<td>41.4</td>
<td>-77.5</td>
<td>0.0</td>
<td>5.7</td>
<td>17.0</td>
<td>349.8</td>
<td>66%</td>
</tr>
<tr>
<td>1st week</td>
<td>19.6</td>
<td>46.0</td>
<td>-77.6</td>
<td>-3.7</td>
<td>4.5</td>
<td>28.1</td>
<td>320.0</td>
<td>61%</td>
</tr>
<tr>
<td>2nd week</td>
<td>23.8</td>
<td>65.8</td>
<td>-85.3</td>
<td>-6.7</td>
<td>4.7</td>
<td>29.8</td>
<td>547.7</td>
<td>58%</td>
</tr>
<tr>
<td>3rd week</td>
<td>24.4</td>
<td>68.0</td>
<td>-94.9</td>
<td>-10.0</td>
<td>3.5</td>
<td>31.1</td>
<td>479.5</td>
<td>56%</td>
</tr>
<tr>
<td>4th week</td>
<td>25.1</td>
<td>68.6</td>
<td>-96.5</td>
<td>-9.5</td>
<td>3.7</td>
<td>30.0</td>
<td>533.3</td>
<td>56%</td>
</tr>
</tbody>
</table>

Table 2 – Underpricing differences according to contract terms

Table tests whether underpricing (measured using first-day, first-week, first-month returns) differ according to: whether the underwriter signed on for best effort versus firm commitment underwriting contract; whether the investment bankers fixed the offer price prior to the book-building process; whether the IPO took place prior to 2001; whether existing shareholders sold any portion of their stake in the IPO.

<table>
<thead>
<tr>
<th></th>
<th>1st day return</th>
<th>1-week return</th>
<th>4-week return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>t-statistic</td>
<td>Mean</td>
</tr>
<tr>
<td>Underwriting method</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Best effort</td>
<td>14.03</td>
<td>2.80</td>
<td>24.90</td>
</tr>
<tr>
<td>Firm commitment</td>
<td>7.13</td>
<td></td>
<td>17.90</td>
</tr>
<tr>
<td>Offer price fixed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>10.92</td>
<td>2.03</td>
<td>29.97</td>
</tr>
<tr>
<td>Yes</td>
<td>6.81</td>
<td></td>
<td>12.67</td>
</tr>
<tr>
<td>Sample period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-2000</td>
<td>12.16</td>
<td>-0.73</td>
<td>14.53</td>
</tr>
<tr>
<td>Pre-2001</td>
<td>15.05</td>
<td></td>
<td>23.15</td>
</tr>
<tr>
<td>Shareholders selling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>7.74</td>
<td>-0.94</td>
<td>13.43</td>
</tr>
<tr>
<td>Yes</td>
<td>10.02</td>
<td></td>
<td>22.23</td>
</tr>
</tbody>
</table>
Table 3 – IPO contracting terms that affect underpricing

Table regresses the measures of IPO underpricing (first-day, first-week, and first-month returns) on deal characteristics. Size is the log of IPO proceeds. Fixed offer price indicator takes on the value one if the offer price is fixed before the book-building process and zero otherwise. Shareholders selling indicator takes on the value one if shares of existing shareholders are offered up for sale in the IPO and zero otherwise. Firm commitment indicator takes on the value one if the investment banker takes on the risk of insufficient demand in a firm commitment contract and zero otherwise. After 2000 indicator takes on the value one if IPO firm lists on Borsa Istanbul after 2000 and zero otherwise. Industry fixed effects are not reported but are included in the regressions if denoted. *, ** denote significance at 5 and 1 percent, respectively.

<table>
<thead>
<tr>
<th></th>
<th>First-day returns</th>
<th>First-day returns</th>
<th>First-week returns</th>
<th>First-week returns</th>
<th>First-month returns</th>
<th>First-month returns</th>
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<tr>
<td>Size</td>
<td>-2.94</td>
<td>-2.86</td>
<td>-6.12</td>
<td>-6.23</td>
<td>-8.88</td>
<td>-9.43</td>
</tr>
<tr>
<td></td>
<td>(2.55)*</td>
<td>(2.40)*</td>
<td>(4.89)**</td>
<td>(4.84)**</td>
<td>(4.53)**</td>
<td>(4.66)**</td>
</tr>
<tr>
<td>Fixed offer price indicator</td>
<td>-6.77</td>
<td>-6.79</td>
<td>-9.03</td>
<td>-9.86</td>
<td>-15.08</td>
<td>-16.45</td>
</tr>
<tr>
<td></td>
<td>(1.54)</td>
<td>(1.53)</td>
<td>(1.86)</td>
<td>(2.00)*</td>
<td>(1.98)*</td>
<td>(2.12)*</td>
</tr>
<tr>
<td>Shareholders selling indicator</td>
<td>-5.95</td>
<td>-5.58</td>
<td>4.03</td>
<td>2.57</td>
<td>-0.57</td>
<td>-1.53</td>
</tr>
<tr>
<td></td>
<td>(1.47)</td>
<td>(1.34)</td>
<td>(0.89)</td>
<td>(0.56)</td>
<td>(0.08)</td>
<td>(0.21)</td>
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<td>Firm commitment indicator</td>
<td>-8.25</td>
<td>-8.04</td>
<td>0.43</td>
<td>-0.7</td>
<td>4.55</td>
<td>4.28</td>
</tr>
<tr>
<td></td>
<td>(1.98)*</td>
<td>(1.88)</td>
<td>(0.09)</td>
<td>(0.15)</td>
<td>(0.62)</td>
<td>(0.57)</td>
</tr>
<tr>
<td>After 2000 indicator</td>
<td>-5.53</td>
<td>-5.67</td>
<td>-4.24</td>
<td>-5.07</td>
<td>-14.49</td>
<td>-14.06</td>
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<tr>
<td></td>
<td>-1.4</td>
<td>-1.41</td>
<td>-0.98</td>
<td>-1.14</td>
<td>(2.13)*</td>
<td>(2.01)*</td>
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<td>Intercept</td>
<td>30.48</td>
<td>25.45</td>
<td>35.9</td>
<td>46.92</td>
<td>54.2</td>
<td>61.42</td>
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<tr>
<td></td>
<td>(6.80)**</td>
<td>(3.08)**</td>
<td>(7.28)**</td>
<td>(3.31)**</td>
<td>(7.02)**</td>
<td>(2.75)**</td>
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<td>Industry FE</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
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<td>431</td>
<td>396</td>
<td>396</td>
<td>396</td>
<td>396</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>4%</td>
<td>3%</td>
<td>7%</td>
<td>7%</td>
<td>6%</td>
<td>6%</td>
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References


