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RESEARCH ARTICLE

The Impact of Going Public on Firm-Level Employment: Evidence from IPO Listed Firms on BIST*

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Abstract
This paper investigates how issuing initial public offerings (IPOs) affects corporate decisions in a firm. We focus on the impacts of capital raised at IPO event dates on subsequent employment growth in IPO listed firms that went public between 2000 and 2016 in Borsa Istanbul (BIST). We find that accessing the public equity market has a positive impact on employment growth through accessing the debt market. As their borrowing abilities improve, firms tend to increase their expenditures on physical capital. In turn, firms need to hire more employees to run their operations. Moreover, we find that reliance on external financing above the median degree or being younger than the median sample age positively and significantly affect employment growth during IPO and in the post-IPO event years. Finally, we calculate the effects of marginal changes in primary capital on firms' assets, cash holdings, capital expenditure, personnel expenditure, and debt, and find that the firms tend to spend an incremental amount of externally generated funds via IPO mostly on physical capital expenditures.

Keywords

IPOs, employment growth, emerging market, corporate decisions

Introduction

What is the impact of going public on firm-level employment growth? Through what channel(s) does going public have an impact on the employment level in a firm? During the life of a company, the decision on issuing initial public offerings[1] (IPOs) can be counted as

1 The stage of an IPO has effects on corporate governance, financial constraints, information environment, and ownership and capital structure of a firm. To identify the main motivation for going public, literature follows different approaches, including surveys with managers, prospectus statements, and accounting information (Andriansyah & Messinis, 2016).

* This research is produced from Ahmet Usta's PhD thesis submitted to Graduate School of Business at Özyeğin University.

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one of the most important events. Therefore, the interest of academicians[2] and policymakers[3] on IPOs has been long-lasting. Similarly, the dynamics and functioning of labor markets are one of the most important prominent and ageless topics in economics. These issues have received great attention because human capital is an important source for the value of a firm (Zingales, 2000). Although the current literature has research on the effects of having access to the public equity market on employment growth in a firm operating in advanced economies, we have no evidence on the same issue in an emerging economy context. An empirical analysis of whether going public has an impact on employment growth is necessary, especially for policymakers in emerging economies that suffer from unemployment.

In this paper, we fill this gap on this topic and report several facts about firms issuing IPOs in Turkey by using microdata from firms listed on Borsa Istanbul (BIST). In particular, we empirically examine the employment dynamics of IPO firms listed on BIST and analyze how going public affects corporate actions, including firm-level employment growth. We also investigate channels via which this influence occurs. Lastly, we document the use of funds raised on the IPO date by using balance sheet items of IPO firms.

The main empirical results in this paper are as follows. Under various specifications, IPOs make a positive contribution to employment growth at the IPO year and the three years afterward. Furthermore, we find that small firms have higher employment growth. Moreover, firms aged below the median age of the sample have positive and statistically significant employment growth between the IPO event year and the succeeding year. These results highlight the growth-oriented motive of small and young firms. Additionally, firms with greater dependence on external equity financing experience higher employment growth in the first post-IPO year. The results of the regressions conducted to explore whether the relaxation of financial constraints have an impact on employment growth suggest that primary proceeds or the reduction in the relative cost of credit has mostly statistically insignificant impact on employment growth. Our results strongly suggest that firms that experience an increase in debt to assets ratio and increase in capital expenditures have positive employment growth during IPO year and subsequent years after IPO. These results suggest that access to external capital increases employment growth triggered by rises in capital expenditures by debt-financing. Finally, we calculate the effect of one-unit change in capital raised at IPO on balance sheet

2 The literature sheds light on the heterogenous effects of going public across different stock markets. Country-specific empirical studies including the U.S. (Bharat & Kini, 1994), Italy (Carpenter & Rondi, 2006; Pagano et al., 1998), Japan (Takahashi & Yamada, 2015), Indonesia (Andriansyah & Messinis, 2016), and Sweden (Baghai & Silva, 2019) consider the post-IPO performance of firms.

3 Policymakers enact laws to attract more firms to list on exchange markets because they view access to the external equity market as important for firm growth. For example, on the heels of the financial crisis, to encourage startups and support small businesses, Barack Obama, former president of the U.S., signed the Jumpstart Our Business Startups (JOBS) Act in 2012. According to this law, small businesses and high-growth oriented firms are expected to receive higher cash flows through IPO, which leads them to grow faster and hire more workers.

items of firms and find that the injection of fresh funds through IPO increases capital expenditures, debt levels, assets, and cash holdings. However, the effect on personnel expenditures is negligible.

The remainder of this paper consists of literature review and hypotheses, some facts about unemployment in Turkey, data and sample, results, and a conclusion.

A Summary of Literature and Hypotheses

This part surveys the relevant literature and establishes the main hypotheses of the analyses. This paper is related to several strands of the literature. First, it is related to the IPO literature that empirically considers the associations between issuing offerings and firm characteristics. Extant literature on IPO suggests that there are associations between issuing offerings and firms' financial constraints (Carpenter & Rondi, 2006; Pagano, Panetta, & Zingales, 1998; Subrahmanyam & Titman, 1999), firms' innovation activities (Bernstein, 2015), and firms' human capital (Carter, Dark, & Singh, 1998; Chemmanur & Paeglis, 2005; Dong, Michel, & Pandes, 2011; Borisov, Ellul, & Sevilir, 2015; Liu & Arthurs, 2019; Baghai & Silva, 2019; Babina, Ouimet, & Zurutskie, 2020).

This study contributes to the empirical literature on the nexus between corporate decisions and human capital. The literature has considered the role of human capital in IPO listed firms in various dimensions. For example, Carter et al. (1998) and Dong et al. (2011) emphasize the role of underwriters' reputation on the long-run performance of IPO stocks and find that good reputation of underwriter has a positive impact on the performance of IPO firms. Bernstein (2015) investigates the role of skilled inventors and finds that the technology firms that went public experience a decrease in the number of skilled workers following the IPO as the quality of innovation declines because of agency problems between managers and shareholders. The main issue is that shareholders blame managers when the innovation fails, causing the managers to lose their jobs. Such concern for one's career discourages the manager from investing in innovations. Baghai & Silva (2019) consider the effect of going public on the composition of the work force and find that access to public equity has a positive effect on professionalism in the recruitment process, wages, and human capital.

The particular interest of the most recent empirical works by Borisov et al. (2015) and Babina et al. (2020) is the change in firm-level employment level subsequent to going public. Both papers show that IPO firms, on average, experience positive employment growth in their post-IPO period. Borisov et al. (2015) examines employment dynamics of a sample of 3,654 U.S. firms and find that the average firm in the sample experiences employment growth by 39% during the IPO year. Their findings are consistent with the ability of a firm to hire more employees after the influx of fresh capital. Babina et al. (2020), with a sample of 3,400

U.S. IPO firms, find that the average annual employment growth increases by 22% over each of the three years following the IPO event year.

According to the above results, the first hypothesis can be established as follows:

Hypothesis 1: There is an association between going public and employment growth for IPO firms.

If **Hypothesis 1** holds true, we should observe employment growth after the IPO event year. When testing Hypothesis 1, we use number of employees in each firm during the period before IPO and in the subsequent three years after the IPO. Then, we calculate the employment growth in the respective year relative to pre-IPO event year. More detailed information about which variable is used to test which hypothesis is provided in subsection of Variables. Moreover, all variables that are used in testing the hypotheses are explained in Table A.1.

To understand the employment dynamics in more detail, the recent literature investigates the roles of firm size and firm age. While Moscarini & Postel-Vinay (2012) highlight the importance of firm size, Fort, Haltiwanger, Jarmin, & Miranda (2013), Colciago, Lindenthal, & Trigari (2019), and Pugsley & Şahin (2019) consider firm age as the first order determinant of employment dynamics of a firm. Haltiwanger, Jarmin, & Miranda (2013) empirically analyze the relationship between employment growth, firm size, and firm age by using the U.S. business sector data over the period between 1992 and 2005. They find that small firms contribute more to job creation. However, when they control for firm age, the inverse relationship between firm size and job growth disappears. Heyman, Norback, & Persson (2018) examine job creation and productivity dynamics by using Swedish business sector data over the period 1996 to 2013. Their findings suggest that small and young firms create most new jobs. They also find that large and mature firms create more productivity gains. Motivated by these studies, this paper takes age and size characteristics of IPO firms into account while testing **Hypothesis 1** and asserts the following second hypothesis:

Hypothesis 2: Age and size characteristics of firms matter for the degree of association in **Hypothesis 1**.

Hypothesis 2 is supported if we observe that employment dynamics vary with respect to age or size of the firm. We create a dummy variable to indicate whether a firm is young or mature. If the firm's age is below the median age of the sample, the dummy variable takes a value of 1. If its age is above the median age of the sample, the dummy variable takes a value of 0. While testing Hypothesis 2, we control the size effect by using different size measures, including sales and number of employees with different cut-offs.

Second, this study is related to the studies that assess the role of the IPO in relaxing the financial constraints of a firm. Pagano, et al. (1998) empirically analyze the impacts of IPOs on the financial constraints and investment policy of a firm. Their findings suggest that the

external equity gained through an IPO reduces leverage and cost of credit. According to Kim (1999), an IPO can relieve the financial constraints of a firm in several ways. The issuance of external equity by accessing the public equity market can allow a firm to reach external financing opportunities, to improve its bargaining power with banks, and to increase the liquidity of its stocks. Therefore, we can put forward the following hypothesis:

Hypothesis 3: Having access to the public equity market relieves the financial constraints of a firm, which can affect employment growth.

If **Hypothesis 3** holds true, we expect to have evidence that relaxation of financial constraints has an impact on employment growth. We use capital raised at IPO date and reduction in cost of debt to proxy for the relaxation. We also assess the role of accessing the debt- and equity-market in firm level employment.

Third, this study is related to studies that analyze use of externally generated funds in corporate decisions. Fresh equity gained at IPO has an impact on the use of funds. The intended use of funds raised at IPO[4] affect the firm's performance in the post-IPO period. This idea indicates that there is an empirical link between funds raised at IPO and corporate decisions (Kim & Weisbach, 2008; Erel, Julio, Kim, & Weisbach, 2012; Calomiris, Larrain, & Schmukler, 2018). In their pioneering work, Kim & Weisbach (2008) analyze how the money created in the offering is used by the firms that raise it. To do so, they consider changes in assets, capital expenditures, acquisitions, inventory, R&D, cash holdings, and the long-term debt using 17,226 IPOs and 13,142 SEOs from 38 countries between 1990 and 2003. Their estimates indicate that the largest portion of money created in the IPO is dedicated to funding R&D and capital expenditures. Moreover, firms also hold a significant part of this money in the form of cash. So, it is possible to test the following hypothesis:

Hypothesis 4: Use of external funds generated through accessing the public equity market would indicate the main motive(s) of the IPO.

Hypothesis 4 is supported by our results if we observe a significant use of external funds on a particular balance sheet item(s). To understand the main motive(s) of the IPO, we follow methodology by Kim & Weisbach (2008) and calculate how much of a one-unit increase in capital raised at IPO is spent on which balance sheet item the most.

This study adds to the previous literature in several ways. First, to the best of our knowledge, this paper is the first to analyze the association between going public and employment growth in an emerging economy context. Our sample consists of IPO firms listed on BIST,

4 Kim & Weisbach (2008) list potential motives for offerings as follows: 1) Finance investments; 2) Wealth transfer from new shareholders to existing ones; 3) Liquidity for both insiders and the firm. According to Andriansyah & Messinis (2016), the intended use of proceeds is classified under the following five categories: 1) Fixed asset investment; 2) Working capital financing; 3) Investment in shares of stocks; 4) Debt repayments; 5) Secondary shares.

Turkey. Second, we extend the analysis of Borisov, et al. (2015) and Babina, et al. (2020) by investigating the fraction of funds raised at IPO on personnel expenditures. To explore how much of the externally generated funds are used for employees, we follow the methodology proposed by Kim & Weisbach (2008). The analysis of the use of funds regarding accounting information enriches our results and informs us about mechanisms through which IPOs have an impact on employment level. Third, we differ from Borisov, et al. (2015) and Babina, et al. (2020) by considering the role of firm characteristics (age and size) of IPO firms. By doing so, we investigate the job creation[5] performance of IPO firms relative to their age and size characteristics. The results are sensitive to different definitions of these two firm characteristics[6]. We use sales and number of employees as size measures. For the age measure, we consider median age of the sample as cut-off.

Some Facts about Unemployment in Turkey

This part provides brief information about the issue of unemployment and job creation policies in Turkey. Moreover, this section addresses some socioeconomic consequences of being unemployed.

Turkey owes its high growth rates at the beginning of the 2000s to foreign capital flows. However, the credit-led growth strategy was accompanied by high unemployment rates. Turkey experienced a jobless-growth period in the post-2001 era (Yeldan & Ünüvar, 2015). On average, the total (youth) unemployment rate in Turkey was around 10% (18%) between 2000 and 2020, according to World Bank data. In the same period, the total unemployment rate for people aged 15 and older in Turkey was almost twice as high as Organization for Economic Co-operation Development (OECD) economies and the World. The youth (aged between 15 and 24) unemployment rate in Turkey exceeded that of the OECD economies and the World, on average, by 4% in the last 20 years. After 2012, both total and youth unemployment in Turkey has increased. Over the last ten years, the rate of total (youth) unemployment reached its peak in 2019 with a rate of 13.5% (23.7%). The wedge between the youth and total unemployment rates in Turkey has continuously expanded between 2012 and 2020. These facts indicate that job creation policies in Turkey were not sufficient to strengthen labor market conditions, especially for the young population.

5 There are voluminous attempts to identify the role of firm age and size in job creation and destruction (Colciago, et al., 2019; Fort, et al., 2013; Hopenhayn, 1992; Jovanovic, 1982; Moscarini & Postel-Vinay, 2012; Pugsley & Şahin, 2019). Recent research by Özlale and Polat (2019) documents a comprehensive summary on the impact of age and size on employment growth, both in advanced and developing economies.

6 According to Moscarini and Postel-Vinay (2012) and Colciago, et al. (2019) a firm is small/medium/large if it has less than 50 employees/between 50 and 999 employees/more than 1000 employees. Other studies, such as Fort, et al. (2013) and Pugsley and Şahin (2019), follow different size cut-offs. They define small/medium/large firms with less than 20 employees/between 20 and 499 employees/more than 500 employees. The age definition in Fort, et al. (2013) is as follows: a young (mature) firm is aged between 0 and 4 (more than 5+). However, Pugsley and Şahin (2019) apply higher age cut-offs, i.e., young (mature) firms are aged between 0 and 10 (more than 11).

The high unemployment rate, especially for the youth portion, has been a severe problem in Turkey. The social consequences[7] of being unemployed cannot be thought of separately from the functioning of the overall economy. According to Karaçimen (2014), the significant rise in consumer debt in Turkey is attributed to developments in the labor market, including rising unemployment and insecure jobs. To sustain their life, households suffering from unemployment become more dependent on borrowing through credit. So, their debt level increases. Akdoğan et al. (2019) highlight the importance of having secured jobs for households to reach housing credit, which affects home ownership rates.

The meagre performance of employment growth leads authorized institutions to support employers and firms by introducing incentives. To create additional employment, the Turkish Employment Agency (İŞKUR) provides wage subsidies, premiums, and tax support to employers who meet certain conditions. Together, İŞKUR and the Social Security Institution, both of which are funded by the unemployment insurance fund, play a major role in conducting such incentives. Moreover, the Capital Markets Board of Turkey, BIST, the Union of Chambers and Commodity Exchanges of Turkey, and the Turkish Capital Markets Association agreed to sign a protocol at the end of 2008 to contribute to firms to benefit from the capital market opportunities. The proposed rules were designed to encourage more IPOs, which, in turn, provide funds for firms and increase their employment levels. However, an academic evaluation of the consequences of this protocol is still missing.

Data

This paper aims to investigate the impact of accessing the public equity market on firm-level employment growth and the channels through which this influence occurs. This part introduces the sample and variable construction with data sources.

Sample

In this study, we consider both time series and cross-sectional data about the corporate characteristics of IPO listed firms on BIST. Regarding the classes of equity markets, our sample consists of firms traded on BIST Star (formerly National Market), BIST Main (formerly National Market), and the Submarket. To obtain information on firm-level data, we utilize several sources including financial annual reports and related footnotes retrieved from investor relations, BIST, and Public Disclosure Platform. In order to make as many observations as possible, we use data sources going back to 2000. Since we are interested in the developments in selected balance sheet items between the end of the year before the IPO event and the subsequent three years after the IPO, our sample includes IPOs that were issued up to

7 The possible costs of unemployment are as follows: debt, poverty, homelessness and housing stress, criminal activity, drug use, increased social exclusion (Attar, 2013)

2016. Using these restrictions, we have 155 firms with IPO filings between 2000 and 2016.

Variables

To measure how employment level evolves around IPO event year, we consider the pre- and post-IPO event windows. Assuming that an IPO-filing took place at year t, we require fiscal year-end observations of time t-1, t+1, t+2, and t+3. This window applies to all variables used in this paper if the relevant observations are available.

Our main variable of interest is the fiscal year-end employment levels in firms around IPO event year. We collect annual employment level data from financial reports by hand.

To investigate channels that establish a link between employment decision and going public, we need firm-specific characteristics. We follow Kim and Weisbach (2008) and Borisov et al. (2015) for these characteristics and consider age, net sales, expenditures made on capital and personnel, total assets, debt issuances, cash holdings, funds raised at IPO and cash flows generated from operating, investment, and financing activities. Annual financial reports are used to gather these characteristics. Table A.1 in the Appendix explains the construction of variables with their definitions used in this study.

Descriptive Statistics

Table 1 displays the distribution of offerings, the total amount of primary capital, and net sales year by year. To calculate the total amount of funds raised on IPO date, we multiply share price and stocks on IPO trading day. While the total amount of net sales is around 84 billion TL, the total amount of capital raised on IPO date is around 10 billion TL over the sample horizon.

Table 1
Number of IPOs, the Amount of Proceeds, and Net Sales (millions TL)

Year	Number of IPOs	Share %	Proceeds at IPOs	Net Sales
2000	31	20	476.56	2,613.88
2001	-	-	-	-
2002	4	2.5	32.18	96.15
2003	2	1.3	15.71	25.22
2004	11	7	310.84	3,690.53
2005	6	3.8	723.12	1,762.29
2006	10	6.4	676.82	6,833.34
2007	7	4.5	2,886.26	32,957.71
2008	2	1.3	841.03	10,476.64
2009	1	0.6	65.91	
2010	22	15	1,721.35	5,501.21
2011	23	15	1,511.80	11,567.79
2012	15	10	316.41	3,410.69
2013	9	6	369.46	3,452.31
2014	9	6	224.40	1,315.54
2015	2	1.3	6.17	68.85
2016	1	0.6	4.43	190.88
Total	155		10,182.46	83,963.02

This table reports the yearly distribution of IPOs in BIST between 2000 and 2016. The third column reports the share of IPOs. The fourth and fifth columns display total amount of capital raised at IPO and net sales in the given year, respectively.

Table 2 reports the summary statistics for main variables including firm characteristics around IPO event year. An IPO filing firm, on average, is around 16 years old, with a median age of 13. The average number of employee that a typical firm has is around 1,354, both in the pre-IPO year and during the IPO year. However, the employment growth rate increases by 4.5% (30%) in the first post-IPO year (in the third post-IPO year) relative to pre-IPO year. Over 17 years, on average, a firm has 65.7 million TL in primary capital. There is an increase in employment growth relative to average number of employees in the pre-IPO year. An IPO firm has 524 million TL and 694 million TL net sales in the pre-IPO and IPO year, respectively. Both assets and capital expenditures display increasing trajectories, while the latter one has a higher growth rate. Data on capital expenditures show that an IPO firm, on average, spent 92 million TL on capital during the IPO year. However, this amount increases to 153 million TL and 242 million TL in the following first and second post-IPO years, respectively. Capital expenditures, by the end of second post-IPO year, more than double.

Table 2
Summary Statistics on Main Variables

Variables	Time	Mean	Median	Obs.
Age	IPO	16.01	12.99	155
Primary Capital (Millions TL)	IPO	65.69	12.19	155
Employment	pre-IPO	1,354.3	166	133
	IPO	1,354.8	193	149
	post-IPO (1)	1,415	192	149
	post-IPO (2)	1,499	207	146
Sales (Millions TL)	pre-IPO	523.66	49.71	113
	IPO	693.91	58.51	121
	post-IPO (1)	794.96	76.96	122
	post-IPO (2)	765.76	90.18	123
Assets (Millions TL)	pre-IPO	926.65	71.74	155
	IPO	1,078.81	89.3	155
	post-IPO (1)	1,310.43	124.46	155
	post-IPO (2)	1,547.87	134.70	153
Capital Expenditures (Millions TL)	pre-IPO	56.44	9.45	149
	IPO	92.30	8.42	154
	post-IPO (1)	153.44	14.81	154
	post-IPO (2)	241.97	17.46	149

This table reports selected summary statistics for main variables used in this study. Age is the difference between IPO event year and founding year of a firm. Primary Capital is the capital raised at IPO event year. Employment is the number of employees of firms in the relevant year. Sales is the total amount of year-end annual sales of a firm in the relevant year. Assets is the total amount of assets that firms have in the relevant year. Capital Expenditures is the total amount of expenditures made by the firms in the relevant year. In the second column, pre-IPO is the year before the IPO event year, IPO is the year in which the firm issued offerings, and post-IPO is the subsequent years after the IPO event year.

In Table 3, we document the total employment statistics with growth rates around IPO year. We categorize firms based on median age in our sample. A firm is young (mature) if its age is below (above) median age. Table 3 displays the average number of employees and their growth rates relative to pre-IPO year. From Panel A, a firm has, on average, 1,354 employees in its pre-IPO year. The change in employment growth gradually increases over a three-year horizon. The average growth rates in Panel B and C imply that young firms have a higher employment growth rate relative to mature firms. While firms aged below 16 experience 26.8% (68.6%) employment growth following the first (third) post-IPO year, firms aged above 16 exhibit -0.72% (11.6%) firm-level employment growth relative to the pre-IPO year. These results indicate that young firms have higher employment growth.

Table 3
Total Employment Statistics Based on Age

Panel A. Sample	**pre-IPO**	**IPO**	**post-IPO (1)**	**post-IPO (2)**	**post-IPO (3)**
Sum	180,122	201,867	210,825	218,826	243,401
N	133	149	149	146	145
Average	1,354.30	1,354.81	1,414.93	1,498.80	1,678.62
Δ relative to pre-IPO		0.04%	4.48%	10.67%	23.95%
Panel B. Young					
Sum	42,014	58,272	61,245	67,231	78,248
N	67	77	77	76	74
Average	627.07	756.77	795.38	884.61	1,057.40
Δ relative to pre-IPO		20.68%	26.84%	41.07%	68.63%
Panel C. Mature					
Sum	138,108	143,595	149,580	151,595	165,153
N	66	72	72	70	71
Average	2,092.54	1,994.37	2,077.5	2,165.64	2,326.09
Δ relative to pre-IPO		-4.69%	-0.72%	3.49%	11.16%

This table reports the total employment statistics and employment growth rates relative to pre-IPO year. pre-IPO is the year before the IPO event year, IPO is the year in which the firm issued offerings, and post-IPO is the subsequent years after the IPO event year. A firm is Young (Mature) if its age in the IPO event year is below (above) the median age of the sample. Age is the difference between IPO event year and founding year of a firm. In Panel A, employment growth rates around IPO event year are calculated for the whole sample. In Panel B (C), employment growth rates around IPO event year are calculated for Young (Mature) firms.

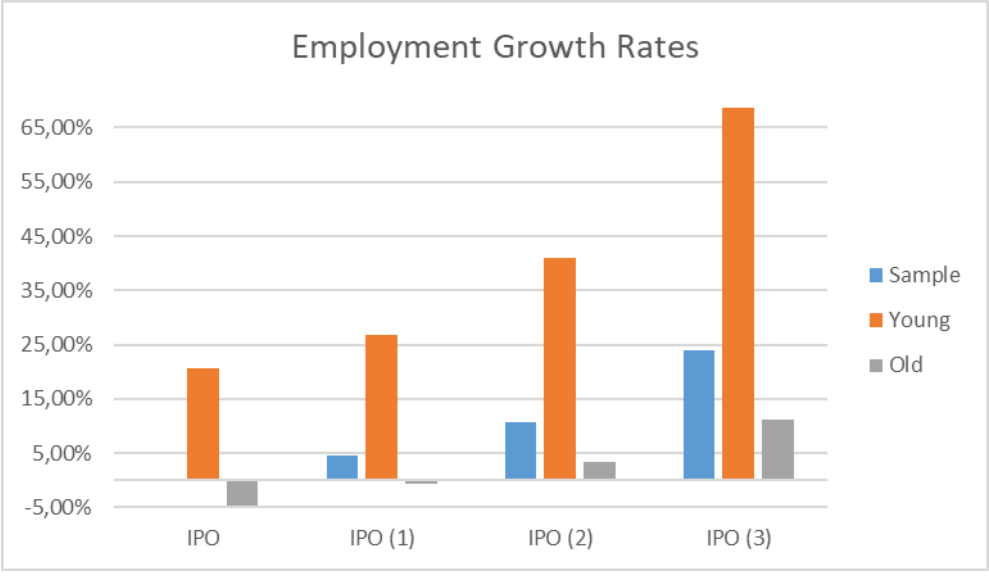

Figure 1: Employment Growth Rates around IPO year

(Source: Author's Calculation)

Results

The employment growth around IPO year

According to the empirical literature, establishment of a causal relation between going public and employment level is challenging. In this sense, we need to consider employment dynamics over a time interval including pre- and post-IPO periods.

One possible concern in our analysis is a potential endogeneity issue that the IPO decision might be influenced by some circumstances of firms. To address the inherent endogeneity issue, we use a restricted sample of firms that complete IPO filings successfully.

In these two subsequent subsections, we are testing Hypothesis 1 and Hypothesis 2.

Table 4 presents the formal test results from a panel regression in which the dependent variable is employment growth rate relative to pre-IPO year. For each of the specifications, we create and use dummy variables. We list firms according to their IPO event years and rename these years t=0, irrespective of actual years. By doing so, we have a common time profile for all firms. To observe the employment dynamics, we expand the time length up to three years ahead of the event year. In the end, we have four time series for all firms, and therefore four dummy variables. D (IPO) takes a value of 1 if the firms are in their IPO year.

A similar argument follows for the rest of the dummies. For example, D (IPO) +2 is a dummy variable that takes the value of 1 for a firm that is in their second post-IPO year. To capture size effects, we consider common proxies, sales, and number of employees, which have been extensively used in the literature. In this way, we have a chance to compare the inferences stemming from either of these proxies regarding the size. For the number of employees, we consider two different categorizations. In the first case, we rely on the median value of the number of employees in our sample. We consider firms with the number of employees above (below) median as large (small). In the second case, we follow size definitions by Eurostat. We categorize the firms with respect to the number of employees they have. Firms with 1- 49 employees are identified as small (S); 50-249 employees are identified as medium (M); and more than 250 employees are identified as large (L).

The results show that the IPO firms have significant employment growth during the IPO and in their post-IPO years. The employment growth for IPO firms becomes more pronounced in their second and third post-IPO years. In all columns, positive coefficients for dummies suggest that employment growth increases around IPO event year.

In columns 2 to 6, we control the size by adding various size measures. In column 2, we use sales as a proxy for the size and we have a negative and statistically significant coefficient, which suggests that small firms tend to have employment growth.

When the size is measured by the number of employees in our sample, we have a negative coefficient, as shown in column 3. However, this result is statistically insignificant. When we control for size according to the size intervals depending on the number of employees suggested by Eurostat, we have statistically insignificant coefficients.

Table 4
Annual Employment Changes After the IPO

		1	**2**	**3**	**4**	**5**	**6**
D (IPO)	0	0.052**	0.086**	0.067**	0.05***	0.04*	0.06**
		(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
	+ 1	0.056**	0.09**	0.07**	0.05**	0.05**	0.06**
		(0.01)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
	+ 2	0.07***	0.11***	0.08**	0.06**	0.06**	0.08**
		(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
	+ 3	0.072**	0.12**	0.08**	0.07**	0.06	0.08**
		(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
Sales			-0.06*				
			(0.02)				
Employee				-0.028			
				(0.02)			
S					0.013		
					(0.02)		
M						0.017	
						(0.02)	
L							-0.025
							(0.01)
Obs.		518	419	518	518	518	518
R-squared		0.07	0.09	0.07	0.07	0.07	0.07

This table reports the estimation results of regressions, in which the dependent variable is annual employment change. The sample includes IPO listed firms on BIST. The sample period is from 2000 to 2016. D (IPO + Y) Y=0,1,2,3 is a dummy variable that takes a value of 1 if a firm is in its respective post-IPO year. Sales and Employees are two different measures for the size used in this study. Defined by Eurostat, firms with 1-49 employees are identified as small (S); 50-249 employees are identified as medium (M); and more than 250 employees are identified as large (L). Clustered robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance level for $p<0.05$, $p<0.01$, and $p<0.001$, respectively.

A Subsample Analysis

In this part, we provide empirical evidence of the relationship between going public and employment growth by using manufacturing IPO firms alone to investigate whether industry matters for this relationship.

We use all IPO firms to obtain the results in Table 4. One thing that should be noted is the low R-squared values for the regressions[8]. One possible reason for having quite small R-squared values might be the omitted variables. The impact of IPOs on employment growth may vary across industries. Therefore, we conduct industry specific regressions to test whet-

8 Thank the anonymous referee to address this issue and for the helpful comments.

her we observe a significant change in the R-squared values. To serve our aim, we consider manufacturing firms because they comprised 30% of the IPO sample (46 out of 155) in this study. Additionally, we estimate regressions with a sample of IPO firms excluding the manufacturing firms. The estimations results are available in Table A.2 and Table A.3 in the Appendix. Estimation results suggest that the R-squared values for the regressions increase when we consider manufacturing firms only. However, we observe a negligible change in R-squared values when the sample excludes manufacturing firms. These results confirm that the relationship between IPO and employment growth varies from one industry to another.

Dependence on External Equity Finance

As stated in the literature, one of the key motives for issuing offerings is to increase fund opportunities to feed corporate investments. To test whether the link between employment growth and going public depends on external equity finance (DEF), we follow Rajan and Zingales (1998) to construct a measure of equity finance dependence. Firm-level measure of dependence on external equity can be calculated as the ratio of net equity and capital expenditure. It is expected that firms that have employment growth have higher external equity dependence if going public has an impact on employment growth. To examine this, we sort firms based on the median value of DEF and create dummy variable D (DEF) that takes the value of 1 if DEF ratio is above the median, which means firm is defined as highly dependent on external equity. Moreover, we sort firms by their age and create a dummy variable, D (Age), which takes a value of 1 if they are under (above) median and called young (mature). We use D (Age) to observe the effect of age of a firm on its employment growth around the IPO event year. We also employ interaction terms between D (DEF) and D (Age) to capture the employment growth performance of young IPO firms with high dependence on equity finance around their IPO event year.

Estimation results are displayed in Table 5. Coefficients on D (DEF) in the first post-IPO year suggest that firms with high dependence on external equity have positive employment growth. These coefficients on D (DEF) in columns 4 to 6 are statistically significant. These results provide us with some evidence that firms that have a higher dependence on external equity finance tend to generate more employment growth after they go public.

Coefficients on D (Age) in all columns indicate that young firms experience greater employment growth during and in their post-IPO years. However, the results are statistically significant only in the first post-IPO year. This finding suggests that young IPO-listed firms experience higher employment growth.

Overall, the coefficients on the interaction between D (DEF) and D (Age) show that the effect of high dependence on external equity on employment growth is independent of how mature a firm is. However, only in the first post-IPO year, the interaction is statistically sig-

nificant, with negative coefficients displayed in columns 4 and 5. This result suggests that young firms with high dependence on equity finance experience lower employment growth in their first post-IPO year.

The estimation results shown in Table 4 and Table 5 clearly suggest that both Hypothesis 1 and Hypothesis 2 hold true.

Table 5
Dependence on Equity Finance

	Δ Employment 0			**Δ Employment 0-1**			**Δ Employment 0-2**		
	1	2	3	4	5	6	7	8	9
D (DEF)	-0.00	-0.02	0.01	0.07*	0.1*	0.1*	0.03	0.00	-0.00
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)
D (Age)	0.06	0.06	0.01	0.17*	0.18*	0.16	0.12	0.13	0.12
	(0.05)	(0.06)	(0.05)	(0.07)	(0.08)	(0.08)	(0.07)	(0.08)	(0.09)
D (DEF) x D(Age)	-0.02	-0.02	-0.06	-0.18*	-0.2*	-0.18	-0.12	-0.1	-0.08
	(0.06)	(0.07)	(0.07)	(0.08)	(0.1)	(0.1)	(0.08)	(0.1)	(0.1
Controls	NO	YES	YES	NO	YES	YES	NO	YES	YES
Obs.	131	104	99	131	104	104	126	104	103
R-squared	0.02	0.04	0.3	0.07	0.08	0.1	0.03	0.05	0.06

This table reports the estimation results of regressions, in which the dependent variable is annual employment change. The sample includes IPO listed firms on BIST. The sample period is from 2000 to 2016. In Columns 1-3, the dependent variable is the change in employment in the IPO event year relative to the pre-IPO year. In Columns 4-6, the dependent variable is the change in employment in the first post-IPO year relative to the pre-IPO year. In Columns 7-9, the dependent variable is the change in employment in the second post-IPO year relative to the pre-IPO year. D (DEF) is a dummy variable that takes a value of 1 if the dependence on external finance of a firm is above the sample median. D (Age) is a dummy variable that takes a value of 1 if the age of a firm is below the sample median. D (DEF) x D (Age) is the interaction term between D (DEF) and D (Age). The control variables are Sales and change in Sales. More detailed descriptions of variables are available in the Appendix. Robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance level for $p<0.05$, $p<0.01$, and $p<0.001$, respectively.

Channels: Financial Constraints

On IPO day, firms access the public and sell their shares. This process results in a fund flow into the firm, which relaxes their financial constraints. Capital raised on the IPO day creates an immediate relaxation on the financial constraints of a firm. In addition to an immediate infusion of capital, an IPO firm can access the debt market upon going public. Issuing IPOs enhances a firm's ability to borrow (Pagano, et al., 1998). To test whether the relaxation of constraints has an impact on employment growth for a firm, we consider capital raised at IPO day and relative cost of credit (RCC), which are suggested by Borisov et al. (2015). The constructions of these two measures are described in the Appendix. If these two underlying channels are effective, we expect them to have a positive relationship with employment growth, as posed by Hypothesis 3. Table 6 displays the estimation results.

Young firms experience higher employment growth in their first post-IPO years. Coefficients on D (Age) in columns from 5 to 9 are statistically significant. This result highlights the job creation impact of young firms (Özlale & Polat, 2019). In all specifications, the

coefficients on Capex/Assets are positive and statistically significant. We have significant evidence on firms with more investment in capital which have positive employment growth. This finding suggests that an increase in physical capital requires more labor to operate these physical assets. Surprisingly, the coefficients on proceeds are insignificant. This result suggests that capital raised at IPO does not have a direct impact on employment growth for a firm. On the other hand, firms facing low cost of credit have employment growth during their IPO year. These results together confirm the findings of Pagano, et al. (1998), who suggest that going public increases a firm's ability to borrow. In columns 4, 8, and 12, we include interactions between D (Age) x Proceeds, and D (Age) x RCC to observe how relaxation of financial constraints in younger firms have an impact on employment growth. However, we find statistically insignificant results. These suggest that the impact of either of the channels is independent of the age of the firm.

As stated previously, an IPO would relax the financial constraints of a firm and allow firm to access the debt market by increasing its borrowing ability. Moreover, IPO firms also have access to the equity market in the post-IPO years. The ability to access both markets would have an impact on employment growth. To test whether the labor decision of a firm is affected through these markets, we consider the debt capital and equity capital of each firm. We normalize each form of capital by pre-IPO total assets. The results of the estimation are displayed in Table 7. As shown in columns 3, 7, and 11, coefficients on Debt/Assets are positive and statistically significant. These findings suggest that debt capital allows a firm to increase its employment. With its ability to borrow, the firm would increase its expenditures on physical capital, and in turn, increase the number of workers it hires. On the other hand, we have a statistically insignificant coefficient for Equity/Assets. Accessing the equity market does not have an impact on employment growth. In the same table, we also test the effect of internally generated funds. To do so, we consider the pre-IPO asset growth rate for each of the firms. If adding the pre-IPO asset growth changes the estimation results, we conclude that internally generated funds have an impact on employment growth. In columns 2, 6, and 10, we observe the effect of inclusion of pre-IPO asset growth in models where we have capital expenditures. In this case, the effect of capital expenditures on employment growth changes. We also have some changes regarding the coefficients on Debt/Asset and Equity/Asset in columns 4, 8, and 12. These results together suggest that internally generated funds in the pre-IPO period have an impact on employment growth.

According to the estimation results displayed in Table 6 and Table 7, Hypothesis 3 holds true.

Table 6
Relaxation of Financial Constraints

	Δ Employment 0				Δ Employment 0-1				Δ Employment 0-2			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
D (Age)	0.05	0.03	0.02	0.03	0.08*	0.05*	0.06*	0.08*	0.06	0.02	0.03	0.09*
	(0.03)	(0.02)	(0.01)	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.04)	(0.02)	(0.03)	(0.04)
Capex/Assets		0.006***	0.006***	0.006***		0.001***	0.001***	0.001***		0.00***	0.00***	0.00***
		(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
Primary Capital			-0.008	0.005			-0.00	0.06			0.01	0.17
			(0.02)	(0.06)			(0.03)	(0.06)			(0.04)	(0.11)
RCC			-0.01***	0.02			-0.07	0.00			-0.05	-0.05
			(0.00)	(0.02)			(0.05)	(0.02)			(0.02)	(0.03)
D (Age) x RCC				-0.04				-0.1				-0.00
				(0.02)				(0.07)				(0.05)
D (Age) x Primary Capital				-0.01				-0.09				-0.2
				(0.06)				(0.07)				(0.12)
Obs.	132	131	113	113	132	131	114	114	129	126	111	111
R-squared	0.02	0.6	0.8	0.8	0.03	0.5	0.6	0.6	0.02	0.5	0.6	0.6

This table reports the estimation results of regressions, in which the dependent variable is the annual employment change. The sample includes IPO listed firms on BIST. The sample period is from 2000 to 2016. In Columns 1-3, the dependent variable is the change in employment in the IPO event year relative to the pre-IPO year. In Columns 4-6, the dependent variable is the change in employment in the first post-IPO year relative to the pre-IPO year. In Columns 7-9, the dependent variable is the change in employment in the second post-IPO year relative to the pre-IPO year. D (Age) is a dummy variable that takes a value of 1 if the age of a firm is below the sample median. Capex/Assets is the ratio between total expenditures made on capital up to the relevant horizon and the book value of pre-IPO assets. Primary Capital is the capital raised at the IPO event date. RCC is the relative cost of credit of a firm in the relevant horizon. More detailed descriptions of variables are available in the Appendix. D (Age) x RCC and D (Age) x Primary Capital are interaction terms between D (Age) and RCC and D (Age) and Primary Capital. Robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance level for $p<0.05$, $p<0.01$, and $p<0.001$, respectively.

Table 7
Effect of pre-IPO Growth

	Δ Employment 0				Δ Employment 0-1				Δ Employment 0-2			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Capex/Assets	0.005***	0.05			0.001***	0.02			0.00***	0.001		
	(0.00)	(0.04)			(0.00)	(0.01)			(0.00)	(0.001)		
Debt/Assets			0.006***	-0.017			0.001***	0.002			0.00***	-0.00
			(0.00)	(0.02)			(0.00)	(0.00)			(0.00)	(0.00)
Equity/ Assets			0.16	0.03			-0.03	0.1			-0.00	0.004
			(0.08)	(0.09)			(0.06)	(0.07)			(0.00)	(0.01)
Δ pre-IPO Asset		-0.005*		-0.003*		-0.01***		-0.01***		-0.01***		-0.01***
		(0.002)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	131	87	125	83	131	87	125	83	126	84	120	80
R-squared	0.6	0.03	0.6	0.03	0.5	0.07	0.5	0.06	0.5	0.06	0.5	0.05

This table reports the estimation results of regressions, in which the dependent variable is the annual employment change. The sample includes IPO listed firms on BIST. The sample period is from 2000 to 2016. In Columns 1-3, the dependent variable is the change in employment in the IPO event year relative to the pre-IPO year. In Columns 4-6, the dependent variable is the change in employment in the first post-IPO year relative to the pre-IPO year. In Columns 7-9, the dependent variable is the change in employment in the second post-IPO year relative to the pre-IPO year. Capex/Assets is the ratio between total expenditures made on capital up to the relevant horizon and the book value of pre-IPO assets. Debt/Assets is the ratio between total debt issuance up to relevant horizon and the book value of pre-IO assets. Equity/Assets is the ratio between total equity issuance up to the relevant horizon and the book value of pre-IO assets. To check for the robustness of the impact of the external funds on employment growth in a firm, we add change in pre-IPO Asset growth. In doing so, we investigate whether internally generated funds have an impact on employment growth. Δ pre-IPO Asset is the pre-IPO asset growth rate. The control variables are Sales and change in Sales. More detailed descriptions of variables are available in the Appendix. Robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance level for $p<0.05$, $p<0.01$, and $p<0.001$, respectively.

Use of Funds

In this section, by using the data on median sized firms in our sample, we estimate and compare the impact of a one-unit increase in both funds raised at IPO and net cash flows, excluding primary capital, on a variety of uses of funds, i.e., expenditures (capital expenditures, personnel expenditures, debt issuances) and asset-based variables (assets and cash accumulation) over different time lengths (one to four years).

To test Hypothesis 4, we follow the methodology by Kim and Weisbach (2008).

Our estimation results rely on the following regressions:

$$Y = \alpha + \beta_1 log\left[\left(\frac{primary\ capital}{Pre-IPO\ Assets}\right)+1\right] + \beta_2 log\left[\left(\frac{other\ sources}{Pre-IPO\ Assets}\right)+1\right] + \beta_3 log[Pre-IPO\ Assets] + \varepsilon,$$

where

$$Y = \log\left[\left(\frac{X_t - X_0}{Pre-IPO\ Assets}\right)+1\right] \text{ for } X = \text{asset} - \text{based variables}$$

and

$$Y = \log\left[\left(\sum_{i=1}^{t}\frac{X_i}{Pre-IPO\ Assets}\right)+1\right] \text{ for } X = \text{expenditures}$$

and

$$other\ sources = log\left[\left(\sum_{i=1}^{t}\frac{total\ sources\ of\ funds_i - primary\ capital}{Pre-IPO\ Assets}\right)+1\right]$$

and $t = 1, 2, 3, 4$ is the years after the IPO event year. Primary capital is the funds raised on the IPO date. Other sources can be obtained by subtracting the primary capital from total sources of funds of each firm that went public. Total sources of funds (net cash flows), which are obtained from the footnotes of financial annual reports, are the sum of flows from operating, investing, and financing activities. To minimize the outliers, both the dependent and independent variables are normalized by pre-IPO total assets.

Table 8
The effect of one-unit change in primary capital on selected items

Items	t	α	t-stat	β_1	t-stat	β_2	t-stat	β_3	t-stat	Obs.	Primary
Assets	1	0.384	2.78	0.367	2.67	0.103	2.9	-0.037	-2.37	76	1.29
	2	0.289	1.78	0.749	3.07	0.186	2.58	-0.0216	-1.17	79	2.02
	3	0.352	1.43	1.088	2.29	0.232	1.01	-0.0249	-0.9	84	2.88
	4	0.594	1.87	0.827	2.16	0.178	1.94	-0.0413	-1.15	85	2.60
Cash	1	0.00035	0.01	0.025	0.51	0.007	1.36	-0.00015	-0.02	76	0.07
	2	-0.094	-1.21	0.19	1.91	0.085	1.85	0.01	1.24	79	0.59
	3	0.27	1.02	0.076	0.41	-0.026	-0.44	-0.03	-1	85	-0.09
	4	-0.0041	-0.05	0.169	1.54	0.002	0.1	0.001	0.1	88	0.16
Capex	1	0.0261	0.26	0.106	0.44	0.0398	0.67	0.00297	0.27	75	0.39
	2	-0.26	-1.1	0.67	1.64	0.0513	0.59	0.038	1.5	78	0.83
	3	0.063	0.11	1.268	1.46	0.16	0.44	0.005	0.09	84	2.36
	4	-0.065	-0.11	1.372	2.01	0.146	0.94	0.03	0.44	87	2.38
Perex	1	0.07	2.69	-0.017	-0.66	0.01	2.29	-0.006	-2.29	71	0.06
	2	0.143	3.04	-0.056	-0.91	-0.0002	-0.03	-0.0138	-2.6	75	-0.05
	3	0.228	3.66	-0.06	-0.71	0.017	0.61	-0.0219	-3.02	80	0.05
	4	0.309	4.15	-0.07	-0.83	0.0076	0.52	-0.0297	-3.34	81	-0.02
Debt	1	-0.773	-2.44	-0.392	-0.89	-0.116	-1.07	0.111	3.1	74	-0.93
	2	-0.469	-1.08	0.141	0.25	0.154	1.17	0.0928	1.89	72	0.84
	3	0.0373	0.06	0.892	0.93	0.463	0.95	0.0482	0.7	78	3.55
	4	0.337	0.48	0.679	0.86	0.363	1.4	0.0332	0.41	81	3.63

This table reports the estimation results of regressions, in which the dependent variable changes for asset-based variables and items on expenditures. The sample includes IPO listed firms on BIST. The sample period is from 2000 to 2016. The last column displays the implied changes in the independent variables listed under items in the first column when the primary capital increases by one unit.

Table 8 reports the estimation results for each of the use of funds for various time intervals from one year to four years. The estimated coefficients on primary capital are positive except for the regression results, in which the dependent variable is expenditures made on personnel. The coefficients on primary capital are all positive and statistically significant in equations

where we estimate the asset variable only. The relatively larger coefficients on assets, cash holdings, and capital expenditure show that funds generated through IPO are likely to be used for the abovementioned items as priority. When we consider the comparison of coefficients on debt, we find that the fresh funds through IPO increase the borrowing ability of firms to finance new investments.

In Table 8, we also report the implied changes in the items from a one-unit increase in funds[9]. Overall results suggest that the expenditures on capital and assets are doubled in response to a one-unit increase in primary capital. In line with these changes, the issuance of primary capital raises debt. The interpretation is as follows: the infusion of new funds increases the credibility of firms. Since the borrowing constraints get relaxed, in turn, firms spend more on capital. The change in asset variable is therefore expected as the book value of assets increases once the new source of funds is introduced. Moreover, as the expenditures on capital increase, the assets that the firm has increase as well. Implied changes in personnel expenditure have mixed implications. Over time, a negligible fraction of primary capital is used to finance the expenditures made on personnel. For the cash item, the estimates show that the largest fraction of one-unit increase in primary capital is kept in the first post-IPO year. Over a four-year interval, firms, on average, keep 16% of a one-unit increase in IPO proceeds as cash.

Conclusion

There is dense literature on IPOs. However, little is known about the impacts of going public on the employment performance of firms, particularly in developing economies. This study provides empirical evidence on this issue by addressing 155 IPO listed firms on BIST over the period between 2000 and 2016. We use micro data from annual financial reports and find several meaningful results regarding changes in the employment level.

Our findings suggest that IPO firms, on average, experience employment growth during their IPO year and in their post-IPO periods, as found in Borisov et al. (2015) and Babina et al. (2020). However, we find that employment growth should not be attributed to the direct effect of capital raised in the IPO. Relaxation of financial constraints through going public helps a firm to access the debt market, which improves its ability to borrow. As the firm's

9 The effect of one-unit increases in funds raised at IPO on assets at t=1 can be calculated as follows: From sample distribution, in addition to coefficients from Table 8, we use median primary capital (12.18), median pre-IPO total assets (71.74), and total resources as the sum of cash or cash equivalent funds from operating, investing, and financing activities (3.02). All units are in national currency, TL, in millions. We obtain predicted value as 0.17 from regression equation. The predicted change is $71.74(exp^{0.17} - 1) = 13.67$. We then increase primary capital by one unit and calculate the predicted change under this new scenario. Our calculation yields 14.96. The difference between these two predicted values, 1.29, is the effect of a one-unit increase in primary capital on assets at t=1.

capacity for borrowing increases, it invests more in physical capital. In turn, the firm needs more employees to run its operations. These results are in line with the findings of Pagano et al. (1998) and Kim and Weisbach (2008). Moreover, we investigate that a part of the employment growth should be linked to internal asset growth, too. Our estimation results highlight the role of young firms in generating higher employment growth, as argued by Özlale and Polat (2019).

Our analysis on the use of external funds raised on the IPO date verifies our results, as well. A one-unit change in primary capital results in an increase in capital expenditures and debt levels, which explains the financing capital investment motive of IPOs.

Quantity alone should not be the priority in the IPO market. Therefore, regulators should impose requirements that enhance the quality of IPOs and provide incentives for growth. If the IPO market were intended to contribute to job creation, allowing firms to access the public equity market with fewer restrictions may be conditioned on a promise to increase employment level in the prospectus. Moreover, as the results of this empirical study strongly suggest, policy makers should provide incentives to firms to increase their capital investments. So, the firms would hire more workers to run their operations.

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Appendix

Table A.1
Variables with Their Definitions

Variables	Definitions
Δ Employment (0-Y) Y=0,1,2,3	Change in the natural logarithm of number of employees in the relevant year relative to pre-IPO year.
D (IPO + Y) Y=0,1,2,3	Indicator variable that is 1 if the firm is in the relevant year, and 0 otherwise.
D (Age)	Indicator variable that is 1 if the difference between the founding year and the IPO event year is below median, and 0 otherwise.
Primary Capital	Natural logarithm of one plus capital raised at IPO divided by pre-IPO total assets.
Sales	Natural logarithm of net sales.
Assets	Natural logarithm of assets.
Δ Pre-IPO Asset	Natural logarithm of ratio of the difference between book value of assets in the closest reporting date and assets in the pre-IPO fiscal year ending relative to the book value of assets in the pre-IPO fiscal year ending.
PEREX	Natural logarithm of the ratio between the expenditures made on personnel and book value of pre-IPO assets. Numerator is the sum of personnel expenditures up to relevant year.
Capex/Assets	Natural logarithm of the ratio between the expenditures made on capital and book value of pre-IPO assets. Numerator is the sum of capital expenditures up to relevant year.
Debt/Assets	Ratio between total debt issuance up to the relevant year and book value of pre-IPO assets.
Equity/Assets	Ratio between total equity issuance up to the relevant year and book value of pre-IPO assets.
D (DEF)	Indicator variable that is 1 if the firm's dependence on equity is above median, and 0 otherwise. DEF is calculated as the ratio between equity over capital expenditure in the relevant year.
RCC	Ratio of 1 plus cost of debt of an IPO firm and 1 plus the median value of cost of debt of all IPO firms, where the cost of debt is ratio of interest expenses and total debt.
Cash flow	Natural logarithm of sum of cash or cash equivalents from operating, investing, and financing activities.
Cash	Natural logarithm of cash left over after expenses paid.

Table A.2
Annual Employment Changes After the IPO for Manufacturing Industry

		1	2	3	4	5	6
D (IPO)	0	0.028**	0.02	0.026	0.031**	0.026*	0.02
		(0.001)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	+ 1	0.036*	0.028	0.034	0.04**	0.035*	0.03
		(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
	+ 2	0.05***	0.043*	0.047**	0.052***	0.047**	0.046**
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	+ 3	0.046*	0.051**	0.044	0.05**	0.043*	0.042*
		(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
Sales			0.008				
			(0.01)				
Employee				0.003			
				(0.01)			
S					-0.053		
					(0.04)		
M						0.0057	
						(0.01)	
L							0.007
							(0.01)
Obs.		158	139	158	158	158	158
R-sq		0.18	0.20	0.18	0.17	0.15	0.15

This table reports the estimation results of regressions, in which the dependent variable is annual employment change. The sample includes manufacturing IPO listed firms on BIST. The sample period is from 2000 to 2016. D (IPO + Y) Y=0,1,2,3 is a dummy variable that takes a value of 1 if a firm is in its respective post-IPO year. Sales and Employee are two different measures for the size used in this study. Defined by Eurostat, firms with 1-49 employees are identified as small (S), 50-249 employees are identified as medium (M), and more than 250 employees are identified as large (L). Clustered robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance level for $p<0.05$, $p<0.01$, and $p<0.001$, respectively.

Table A.3
Annual Employment Changes After the IPO excluding Manufacturing Industry

		1	**2**	**3**	**4**	**5**	**6**
D (IPO)	0	0.063**	0.127**	0.078**	0.06**	0.055*	0.078**
		(0.02)	(0.04)	(0.03)	(0.02)	(0.02)	(0.03)
	+ 1	0.064*	0.135**	0.079*	0.06*	0.056*	0.08*
		(0.02)	(0.04)	(0.03)	(0.03)	(0.02)	(0.03)
	+ 2	0.078**	0.15**	0.092**	0.074*	0.07*	0.092**
		(0.03)	(0.05)	(0.03)	(0.03)	(0.02)	(0.03)
	+ 3	0.084**	0.16**	0.1*	0.081*	0.076*	0.1*
		(0.03)	(0.05)	(0.04)	(0.03)	(0.03)	(0.03)
Sales			-0.1*				
			(0.04)				
Employee				-0.033			
				(0.02)			
S					0.01		
					(0.03)		
M						0.034	
						(0.04)	
L							-0.035
							(0.02)
Obs.		360	280	360	360	360	360
R-sq		0.07	0.1	0.07	0.07	0.07	0.07

This table reports the estimation results of regressions, in which the dependent variable is annual employment change. The sample includes IPO listed firms excluding manufacturing firms on BIST. The sample period is from 2000 to 2016. D (IPO + Y) Y=0,1,2,3 is a dummy variable that takes a value of 1 if a firm is in its respective post-IPO year. Sales and Employee are two different measures for the size used in this study. Defined by Eurostat, firms with 1- 49 employees are identified as small (S), 50-249 employees are identified as medium (M), and more than 250 employees are identified as large (L). Clustered robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance level for $p<0.05$, $p<0.01$, and $p<0.001$, respectively.