High Performing Firms in Turkey: Jobs and Productivity

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Abstract

High-performing firms (HPFs) are those with rapid growth potential and are early movers with respect to the recognition and realization of sector-specific growth opportunities. HPFs are at the core of Turkey's net job creation. Knowing what firms create the most jobs and/or are the most productive can help policymakers make better use of resources, especially in periods that require tight fiscal discipline. This paper uses administrative data to identify which subsectors (and firms) are most productive and/or most likely to create jobs. It uses eighteen different definitions covering the various employment or value-added outcomes. It also considers the dimension of job quality by assessing whether HPFs also offer jobs with good working conditions (such as social security coverage, permanent contract) to workers. Results show that HPFs in terms of value added (labeled V-HPF) or employment (L-HPF) have similar patterns. They create many of the new jobs in the economy, especially L-HPFs, and contribute to economic dynamism and growth. But there is a lot of churning, and even though HPFs create more net jobs than non-HPFs, they also contribute to job destruction as part of their growth process. The presence of HPFs in a sector is a predictor of subsequent growth. Thus, there is need to pursue policies that provide effective supportive measures to enable HPFs to sustain their successful performance.

Keywords: Firm dynamics, Job creation; productivity; Labor demand and supply
JEL codes: D22, D24, D61, E24, J20, J23

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1. Introduction and Motivation

High-performing firms (HPFs) are those with rapid growth potential. There is growing evidence that HPFs are responsible for stimulating economic growth and development. They do so by encouraging innovation, productive investments, and employment growth, accounting for a large share of the new jobs created. There is no consensus on the definition of high performance; but there is a shared opinion that these firms are sources of innovation and business leadership and they contribute immensely to the economy and to economic development (Acs and Mueller, 2008; Henrekson and Johansson, 2009, 2010). Consequently, exploring firm dynamics to identify HPFs can offer valuable insights into promoting dynamic entrepreneurship in Turkey.

Empirical interest in HPFs came about in the late 1970s when Birch (1979) showed that a subset of (small) firms created most new jobs in the United States. He called these fast-growing firms 'gazelles'. However, many researchers found that most small firms remained small, referred to as 'mice', and only a subset of small fast-growing firms created jobs. Researchers also noted that many large firms, in terms of employment size, and referred to as 'elephants', created few new jobs (Birch and Medoff, 1994). In the literature, the term 'gazelle' is limited to all enterprises up to five years old with average annualized growth greater than 20 percent per annum over a three-year period, and with 10 or more employees at the beginning of the observation period. This paper uses the terms 'HPF' rather than 'gazelle' to avoid being restricted to young firms, and 'high performance' instead of 'high growth' because performance is a more encompassing term that includes strong performance in levels, any form of change, irrespective of initial size and age.

Much of the literature focuses on high-growth firms because they account for a large share of job creation (Haltiwanger et al., 2010). Most studies measure growth in terms of employment, firm sales, firm labor productivity and firm value-added. Some researchers argue that growth depends on the indicator used, how it is measured and the circumstances in which it comes about (Delmar and Davidsson, 1998; and Delmar et al., 2003). There are also various ways to measure growth; for instance, using absolute or relative terms, or focusing on different periods of time, or defining and constructing indicators differently. Most studies focus on employment and sales growth and fewer on productivity growth (Daunfeldt et. al. 2010). But no matter what the approach is, a few common themes emerge; for instance, HPFs are present across most sectors and many HPFs are small though not exclusively. In fact, large firms create more jobs in absolute terms, while small ones grow fast in relative terms. Another common feature is that HPFs are younger than average firms.

Employment in Turkey grew from 2005 to 2016; however, job creation was accompanied by flat productivity. Such a phenomenon indicates that workers and firms are not producing goods and services in the most efficient manner, which affects Turkey's competitiveness and economic growth.

[1] The authors would like to thank colleagues from the World Bank, especially Mary Daimler Hallward for her invaluable inputs on the methodology; Cem Mete, Heba Elgazzar, Laurent Yves Bossavie, Sirma Demir Seker, Mattia Makovec and Francesca de Nicola, Victoria Strokova and Sandor Karacsony. Also, Victoria Levin for her inputs at the start of this work. Most grateful to all the colleagues from the Ministry of Industry and Technology from the Republic of Turkey for their support throughout the preparation of this paper.

Moreover, labor market pressures have worsened since early 2018, during a period of minimal economic growth; and since the economy has begun contracting in the last few quarters, economic conditions have worsened even more. For instance, many firms have slowed down (or stopped) new investments; and such lack of economic activity and dynamism has negatively affected productive investments and new job creation in the formal economy.

There are two main reasons why it is important to identify HPFs in Turkey. One is to know which firms and subsectors are creating new jobs mostly and the second is to know which firms and subsectors are the most productive. Knowing the answers can help policymakers make better use of resources, especially in periods that require tight fiscal discipline. For instance, the Turkish (formal) economy is dominated by small-size firms (employing less than 19 workers) while larger firms (with over 100 employees) employ over 40 percent of formal workers. Many policies and financial support programs target certain firms (by size, sector and location) assuming they can create sustainable jobs and be innovative and productive. However, these policies and programs are often ill informed; and they are likely crowding away resources from worthy firms (and subsectors) by trapping workers and wasting resources in unproductive firms and firms with low potential to create sustainable jobs.

Despite having experienced positive net job creation in the years before the current economic downturn, about half of the jobs created (in 2015–2016, for example) were in sectors with low or medium levels of productivity. Apart from low (or negative) growth, there has also been a slowdown in recent years in the shift of employment out of low-productivity agriculture and into higher-productivity industry and services. Such decline affects how many educated (many of them university graduates) workers can be absorbed into the formal economy. In fact, wage premiums for university graduates have declined in recent years; increases in the relative supply of better educated workers, likely running ahead of increases in demand, may have put pressure on earnings premiums, leading to a sharp decline. The decrease in wage premiums for skilled, and more productive, workers can reduce the incentives for people to seek higher education. And a reduction in the skills of the labor force can negatively affect productivity in the longer term.

The importance of economic growth and new job creation cannot be understated in a country with a relatively young population (population growth is expected to peak around the year 2050) that requires about 700,000 new jobs per year to absorb new entrants (World Bank 2019). As such, economic growth, productivity improvements and job creation are at the top of policymakers' agendas. By knowing which subsectors and firms can yield such important outcomes, policymakers can not only ensure that there are no hindrances in the enabling environment for these subsectors and firms to thrive, but also target their support in a more informed manner.

Despite the importance of identifying HPFs, only limited rigorous research has been done around the world. Storey (1994) and Henrekson and Johansson (2010) identified several studies dedicated to the topic. There are also many papers in the business literature; most compare the characteristics of fast-growing firms and some delve into case studies. The main findings from the existing literature are that few firms, between 2 and 10 percent depending on various factors (e.g. country context, years studied, definition of growth used), create most of the net new jobs. Those firms are defined as fast growers and the jobs are long lasting (Acs and Mueller, 2008; Lopez-Gracia and Puente, 2012).

This paper contributes to the literature in three ways; first, it uses a rich administrative dataset to identify which subsectors (and firms) are most productive and/or most likely to create jobs, using a variety of definitions to avoid constraining the analysis in any way. Second, it helps to better understand what makes an HPF by identifying characteristics (ex-ante) to predict the probability of becoming high performing over time. Third, the analysis brings in the dimension of job quality by assessing whether HPFs also offer good quality jobs to workers.

The paper is organized as follows: the following section briefly describes the database and the sample used for the analysis. It also provides some stylized facts on jobs and productivity to contextualize the analysis. Section 3 explains the empirical methodology, discusses the definition of HPFs used in this paper and describes the analysis in more detail. Section 4 presents the results of the analysis, and Section 5 provides concluding remarks.

2. Data and Stylized Facts

The data

Despite the importance of identifying and characterizing HPFs around the world, and in Turkey, there are surprisingly few studies (Storey 1994; Henrekson and Johansson, 2010; Crnogak and Sirec, 2014). One of the reasons for such limited research is the lack of suitable data to do rigorous analysis. Fortunately, suitable administrative data is available in Turkey and adequate methods were developed to investigate the incidence of HPFs in Turkey.

This paper uses administrative data for Turkey to examine the implications of using different definitions in identifying which firms drive labor outcomes and how robust the patterns are across emerging markets of different size and level of development. And where the panel of firms is sufficiently long, we also look at how the results vary across the business cycle; the characteristics of firms that create (or destroy) jobs can vary in important ways depending on overall macroeconomic conditions.

The data used in this paper comes from the Entrepreneurship Information System (EIS). The EIS contains firm-level administrative data merged by the Ministry of Industry and Technology using IT-based technology. Data comes from different sources such as the Revenue Administration, Social Security Institution, Turkish Statistical Institute (TUIK), Small and Medium Enterprises, Development Organization (KOSGEB), Ministry of Customs and Trade, The Scientific and Technological Research Council of Turkey (TÜBİTAK), Turkish Patent Institute, among others. All non-financial firms registered in the government system have been covered by EIS, which contained about 3 million firms and 12 million workers in 2016. Data is available annually from 2006 through 2016.

The data includes enterprise level information in various dimensions including sector, location, balance sheet, income statement, foreign and domestic trade, innovation, and employment. The Revenue Administration provides information about the balance sheet and income statement of firms. The Social Security Institution provides the number of formal employees at the firm level. Enterprises report on their total revenue and employment, their location and a detailed sector code (4-digit code, excluding the military, banks and financial institutions), and worker information (such as age, gender, wage, number of days worked and occupations). The economic activities of firms are collected from

TUIK and classified with respect to NACE Rev2 (and ISIC) codes. The location of the firm is also provided at the provincial level or NUTS3 level (81 provinces of Turkey). Due to its panel structure, EIS allows firms to be tracked over time and the dynamics of cohorts to be investigated – 10 consecutive years since birth. The data includes all sectors except for the military and banking sectors.[2]

For the analysis in this paper, only firms with 10 or more workers are selected to avoid skewing the results towards identifying fast-growing firms among the smallest firms. Skewing can happen when a micro firm hires a single worker and the rate of growth jumps drastically. Including firms with 10 or more workers also allows for cross-country comparisons. The sectors that are largely public (health, education; isicv4-2digits > 84) were excluded. Descriptive data of the sample used for this analysis are shown in Table 1. Over 317,000 firms are included. Between 1 and 15 percent of firms are considered L-HPFs, and between 1 and 25 percent of firms are considered V-HPFs, depending on how inclusive the definition used is.

Table 1 Descriptive data of the sample studied

	Number of firms	Number of firms that never become L-HPFs	Number of firms that never become V-HPFs
Number of Firms	317,988	223,852	233,238
Net job creation	4,426,253	870,684	723,559
Job creation	12,804,508	5,616,205	5,141,715
Job destruction	(8,378,255)	(4,745,521)	(4,418,156)

Source: Authors' elaborations based on EIS data

The variable age is added to the analysis because the recent literature finds that age matters most for growth (Haltiwanger et. al. 2010). Firm age is based on when firms began operations; but it should be noted that firms only enter the sample when they pass the 10-employee threshold. Thus, there are firms whose birth and initial performance are not included because they originally had less than 10 workers. Annex 7 shows that nearly 60 percent of firms are five years of age or younger, while 3 percent are 20 years or older. Firms stay in the sample once they pass the minimum employment threshold, even if they subsequently fall below it, to avoid biasing the sample to those with better performance. Lastly, there are establishments that do not report anything and then reappear in the sample (or report) again. These firms are not counted as having exited the sample; exits are only reserved for establishments that do not reappear in the dataset again.

Jobs and Productivity

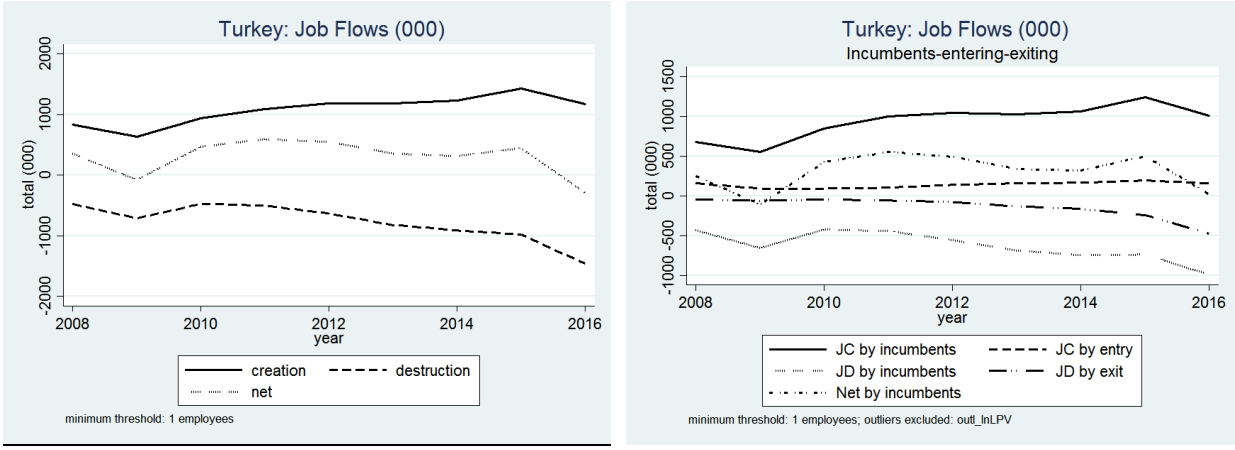
Net job creation in the formal sector in Turkey had been increasing since 2009 but began to decline after 2015 (Figure 1, left panel). There are various reasons for the decline, including increasing labor costs and decreasing labor demand. Job creation can occur through the entry of new firms or through the expansion of existing firms (i.e., incumbents). For Turkey in 2016, job creation by incumbent firms was 1,127,000 or 87 percent of all jobs created, while jobs created by new firms constituted 6 percent (Figure 1, right panel).[3] Likewise, more jobs are lost from incumbents who are downsizing

[2] EIS does not allow an analysis of the effects of the programs/incentives through which firms benefited from the Turkish government.

[3] Figure 1 (right panel) has net job creation (job creation minus job destruction), but also total job creation by entry and incumbents and total job destruction by exit and incumbents.

(1,070,000) than from firms exiting (though 32 percent of all jobs destroyed are due to exits, roughly 514,000 jobs). Overall, net job creation has been positive as the formal sector has continued to expand in the economy.

Figure 1 Job flows in Turkey



Source: Authors' elaborations based on EIS data

An analysis of dynamics over a short period shows that even though a significant share of young firms in the Turkish economy stayed the same size as when they started, a non-negligible share changed size category in their first five years. Very few firms grew significantly, moving from micro or small size to large size. Instead, firms that grew mostly moved up one size category. For instance, 28 percent of firms that started as small (10-19) grew to medium size (20-99) but only 1 percent grew to large (100+) in five years (Table 2). Change includes downsizing and exiting; many smaller and medium-size firms, young and old, downsized during this period. Young firms are more likely than older firms to exit; for instance, 48 percent of micro and small firms exited in the first 5 years of life, while only 14 percent of older micro and small firms exited. Larger firms are less likely to downsize and exit in general, which makes sense given the amount of investment needed to set up and the potential options they have to operate during difficult times. About 83 and 49 percent of older micro and small firms, respectively, remained the same size, indicating that size changes happen mostly at the beginning of a firm's operational life.

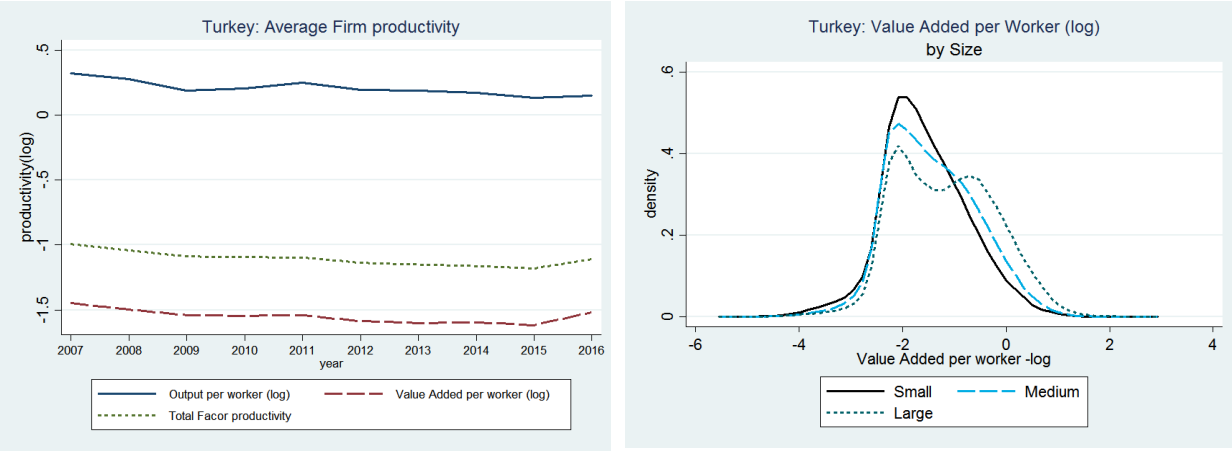
Table 2 Transition Matrix

Transitions 2007-2016 in Turkey		**1-9**	**10-19**	**20-99**	**100+**	**Exit**	**%**
size at birth to age 5	**1-9**	57	8	3	0	32	100
	10-19	20	35	28	1	16	100
	20-99	8	10	56	12	14	100
	100+	2	1	9	77	12	100
size t to t+3	**1-9**	83	8	2	0	8	100
	10-19	23	49	22	0	6	100
	20-99	6	12	70	7	5	100
	100+	2	1	12	80	6	100

Source: Authors' elaborations based on EIS data

Productivity levels of formal firms in Turkey have been largely stagnant since 2007, irrespective of the productivity measure used (Figure 2, left panel). However, there was a slight uptick in productivity (Total Factor Productivity and value added) in 2016, which can be attributed to *capital-labor* substitution in some sectors as labor costs increased (minimum wage increased by 30 percent in 2016) or *labor-labor* substitution in sectors where formal workers were substituted for informal (unaccounted) workers. Figure 2 (right panel) shows that larger firms are more productive, on average, though productivity differences by firm size are not that notable. It is desirable to have a positive correlation between the size of a firm and productivity (static efficiency), but it is even better to have the ones that are increasing their productivity to be growing (dynamic efficiency). If larger firms, where many workers are engaged, become more productive, this can contribute to better use of resources (human and capital) and result in faster increases in overall productivity growth.

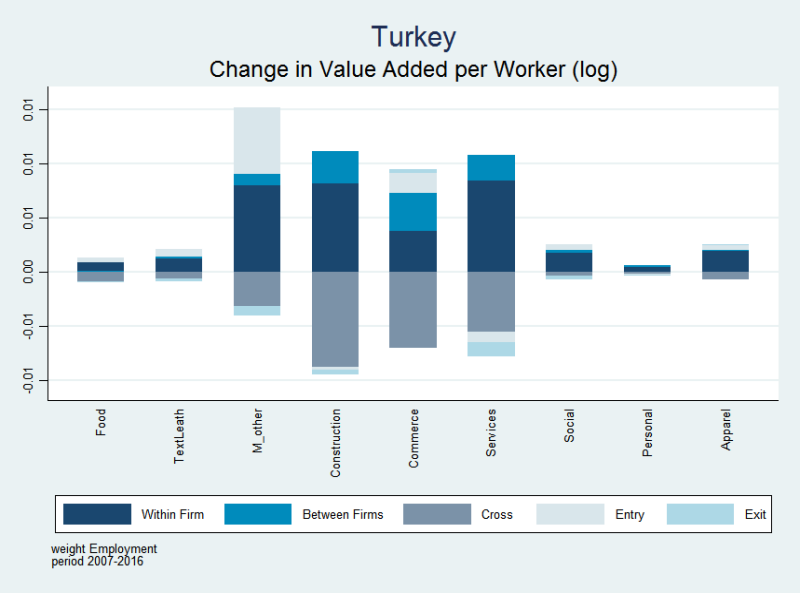
Figure 2 Average firm productivity



Source: Authors' elaborations based on EIS data

There are substantial differences in productivity across sectors, and changes in productivity levels over time can be attributed to different factors. For instance, in manufacturing (except textiles), construction, commerce and services, changes in productivity stem largely from firms in the sector making changes (or investment) that positively affect their production process (within term) and reallocating resources towards firms that are more productive (between term) (Figure 3). In the case of manufacturing, and to some extent in commerce, a significant portion of productivity improvements are related to new productive entrants to the sector. There are also declines in productivity that are due to firms shedding formal productive workers (this refers to the cross term, which is a correlation of changes in productivity and changes in employment) and potentially substituting them for less productive (likely informal) workers. In terms of exits from the sector, some sectors are losing productive firms while others are shedding unproductive firms.

Figure 3 Change in value added per worker, by sector



Source: Authors' elaborations based on EIS data
Note: "M_Other" stands for other manufacture sectors.

Productivity improvement is imperative for Turkey to regain its competitive edge across the world. Turkey cannot keep raising prices to sustain wage increases (unless the quality of output also improves). Nor can it keep enforcing high firing costs and subsidizing workers to protect them from unemployment. Instead, Turkey should ensure that its industry and human resources are upgraded so that the economy can continue to benefit from the changing patterns of globalization. Thus, identifying HPFs with strong employment and (not 'or') productivity is one way to ensure that the right HPFs are supported so that Turkey can begin to grow sustainably once again.

3. Methodology

Identifying HPFs is not an easy task since it depends on the definition being used. The various definitions may focus, for example, on whether the HPF is one that grows or achieves a high level of performance; whether changes need to be sustained over a period; whether thresholds are absolute or relative; or whether the outcome of interest is employment, growth or productivity. Whether there are systematic firm characteristics to be an HPF and whether the success has been sustained over a long period are other critical steps among others to identify HPFs in the formal economy (Aterido and Hallward-Driemeier, 2019).

As mentioned above, this analysis uses panel census data, 2007-2016, collected in the Entrepreneurship Information System (EIS). HPFs are identified based on the performance of two outputs: employment and value added. Value added is defined as follows:

$$Value\ Added_{\ t} = (Labor\ costs_t + Operating\ profits_t + Depreciation_t\ )\ /\ Sectoral\ deflations_t$$

Values are in reference to 2010 (real local currency in thousands). We use CPI to deflate wages and 2-digit sectoral deflators for gross output, value added, inputs or capital. At birth, job creation is initial

employment when the firm starts operations. We measure job destruction at exit by including a consecutive observation with employment and value added equal to zero.

Absolute measures of firm growth can lead to a bias towards larger firms, while relative growth measures can lead to a bias towards smaller firms (Acs et al., 2008; Schreyer, 2000).

Episode refers to the high growth instance that defines an HPF. *Window* refers to the period in which episodes are measured. *Windows* are a minimum of four years (three years of high growth). Some HPFs require outstanding growth every year within the window, while others require only an equivalent growth within the window.

Outcomes refers to the base variable to measure high growth. We use two different outcomes to identify an HPF: employment or value added. High growth implies total job or value added generated in the episode or growth rate. Table 3 presents the dimensions for selecting employment and value added HPFs.

Table 3 Different dimensions for selecting employment and value added HPFs

Selecting on different dimensions for Employment or Value Added outputs include:				
Age:	***Persistence:***	***Performance:***	***Selection:***	***Period selecting:***
No restrictions *(tt3)* Young *(15 or 05)*	Required positive performance every year *(s=sustained)* No restrictions (j=jump)	Growth rate *(g=growth)* Increased level outcome (c=change)	Relative –top 5% *(r=relative)* Absolute -i.e. 20% growth *(a=absolute)*	- Pooling years - Year by year – offsets business cycle effects *(y)* (always 4 years)

Source: Aterido and Hallward-Driemeier (2019)

- *Growth* (g)[4] vs. *Change* (c): growth measures performance by rate while change measures increase in outcome (jobs or value added). HPF selection depends on whether one or the other is applied. Because a growth rate is relative to base size, it does not necessarily generate a high number of jobs. Change, on the other hand, selects the size of the "jump" measured by job or value added created in the episode. Selection based on 'change' is skewed towards large firms. On the other hand, countries with a higher share of small firms will likely select relatively smaller HPFs using growth measures. This is not only because the probability would be higher, but also because a small growing firm achieves higher rates of growth more easily than a large firm. To circumvent this, Birch created a measure which captures the benefits of both growth and change. The measure multiplies the employment change by the ratio of current to previous employment $\Delta L*(L/L_{t-1})$.

- *Relative* (r) versus *Absolute (a)*: relative benchmark is a selection of best firms based on their position in the distribution. We use top 5%, which is widely used in the literature. There is not a fixed number of HPFs when selected by absolute criteria (a fixed rule). The number of HPFs depends on how relaxed the rule is. The larger the number of HPFs, the larger the outcome (number of

[4] A letter in parenthesis next to criteria indicates the index we use throughout the paper for each criterion. "g" is the index used for "growth" HPF.

created jobs or value added). The OECD definition, the most widely definition used, is an absolute selection. A firm is an HPF if employment growth is equivalent to 20% in 3 years with no conditions on age or sustainability. Because this is not a high bar, OECD HPFs create more jobs, but individual firms are less efficient on average.

- *Sustained* (s) vs. *Jump* (j)*:* Sustained is the requirement that an HPF has high performance in each year within the window where the episode occurs.
- *Young* (15) vs. any age (tt3): A firm is considered young if it is 5 or less years old (firms that exit before 5 are not in the pool). Definitions requiring firms to be young have only 2 possible windows of growth; thus, we only select *relative* (top in the distribution). (*1-5*) indicates that the outcome at age 5 is measured in relation to size at birth. We also identify an HPF by its size at age 5. In this case, the outcome in the base year is zero because the firm does not exist. In this case, there are no sustainability requirements.

- By year (y): In addition to the criteria used, we select pooled firms or only firms in a given year. This is to mitigate the possibility that outputs are driven by the business cycle.

Each outcome and dimension determine which firms are selected and what their total outcomes will be. Combining these dimensions in different ways yields 18 different types of HPFs for each outcome (employment or value added). All 18 definitions used in the analysis are listed in Table 4. For example, HPF15 (tt3jga) is based on the OECD definition and can be interpreted as 3 years of growth between t and t+3 (20% growth for 3 years). The OECD definition (tt3jga) can be read as follows: *tt3* stands for the growth between t and t+3, *j* means jump, *g* shows that the performance indicator is growth, and *a* denotes the selection criterion is absolute. Each definition's name has the same logic to interpret.

Table 4 Definitions used to identify HPFs

Defining High Performing Firms						
Number	*Name*	*Performance*	*Periods used to calculate relative threshold*	*Age*	*Persistence*	*Selection*
HPF1	tt3jcry	change	year-by-year	t-t3	jump	relative
HPF2	tt3jcr	change	pool each firms's best episode	t-t3	jump	relative
HPF3	tt3scry	change	year-by-year	t-t3	sustained	relative
HPF4	tt3scr	change	pool all episodes	t-t3	sustained	relative
HPF5	15jcr	change	one episode per young firm	1-5	jump	relative
HPF6	15scr	change	one episode per young firm	1-5	sustained	relative
HPF7	05jcr	change	one episode per young firm	0-5 *	jump	relative
HPF8	tt3jgry	growth	year-by-year	t-t3	jump	relative
HPF9	tt3jgr	growth	pool each firms's best episode	t-t3	jump	relative
HPF10	tt3sgry	growth	year-by-year	t-t3	sustained	relative
HPF11	tt3sgr	growth	pool all episodes	t-t3	sustained	relative
HPF12	tt3Sgry	growth	year-by-year	t-t3	SUSTAINED **	relative
HPF13	15jgr	growth	one episode per young firm	1-5	jump	relative
HPF14	15sgr	growth	one episode per young firm	1-5	sustained	relative
HPF15	tt3jga	growth		t-t3	jump	absolute
HPF16	tt3sga	growth		t-t3	sustained	absolute
HPF17	tt3sgA	growth		t-t3	sustained	ABSOLUTE #
HPF18	tt3cgry	Birch ##	year-by-year	t-t1	jump	relative

* Includes entry; comparison is made at the level of employment (or value added) at age 5
** Rather than calculate the threshold and keep those that sustained non-negative growth; only calculate the threshold on those that have sustained growth episodes. This reduces the share of firms, so the cutoff was taken at 10% instead of the usual 5%.
# Meets 20% growth 3 years consecutively
The product of change & growth

Identifying HPFs in terms of job creation (and productivity) can help policymakers know which firms and subsectors are more likely to help lower unemployment levels. But the goal for Turkey is not just to create more jobs, but also to create good jobs. This means that the quantity of jobs is not the only consideration for policymakers; they also have to be concerned whether the jobs created are quality jobs and offer workers opportunities for a better livelihood. To address the quality concern, the HPF analysis considers the quality of jobs created by crossing with the results from the recently launched Job Quality Index (JQI) (World Bank 2018).

The World Bank's JQI consists of 6 dimensions and 13 measurable components. The micro data used (Labor Force Survey) are collected annually by the Turkish statistical agency TUIK, which allows for regular monitoring and cross referencing of the HPF results year-on-year. The estimation is done for different types of workers, subsectors, and geographic distribution. The selection of the dimensions (and components) is based on what the labor literature and labor practitioners consider important to job quality. Creating a positive and safe work environment, providing competitive benefits, and facilitating flexible work arrangements all matter for worker satisfaction. Evidence also shows that workers who are happy and work with a positive mindset have higher levels of creativity, engagement, and productivity (Achor 2012; Lyubomirsky and Diener 2005; Oswald et. al. 2015).

Generating enough quality employment opportunities is one of the challenges Turkey is currently facing. In fact, results from the JQI analysis (World Bank 2018) show that the distribution of job quality is widespread (job quality varies across the full spectrum) and there has been a shift to the left of the entire job quality distribution between 2014 and 2017, resulting in lower job quality at the aggregate level. The wide distribution of job quality in Turkey spreads from as low as 0 (worst quality) to as high as 1 (best quality) in 2017. Interestingly, the left tail of the distribution has spread out further in 2017, compared to 2014, indicating that there are more vulnerable jobs in 2017 than in 2014. By crossing the HPF analysis and the JQI results, the paper is able to not only identify which subsectors create the most jobs in Turkey, but also which subsectors create the most quality jobs. Also, jobs quality for formal workers (formal temporary and formal permanent) has increased since 2009 but declined in the last few years. As expected, the JQI for informal jobs is significantly lower; however, those workers are not included in the HPF analysis.

4. Results

HPFs in terms of value added (labeled V-HPF) or employment (L-HPF) have similar patterns. There are 18 different definitions per outcome (employment or value-added). No subsector is identified to have an HPF across all 18 definitions. The paper provides detailed results for various definitions. However, two are most commonly used in the literature: (i) HPF15, which is the definition used by the OECD, measures absolute growth equivalent to 20 percent in 3 years; and (ii) HPF18, which is the definition used by Birch, measures growth*change relative. The HPF15-OECD definition shows that many firms pass the threshold at much higher rates than other measures (48,819 for employment; and 81,105 for value added); therefore the overall net job creation is also large (2.769 million and 3.082 million) but the net job creation per firm is the lowest of all definitions (14.3 and 8.3, for employment and value added, respectively). This means that the OECD definition considers too many firms to be high performing while they ultimately do not create much employment. The HPF18-Birch definition shows that fewer firms pass the threshold (16,670 for employment; and 16,255 for value added) but

the overall net job creation is like the previous measure (2.827 million and 2.529 million); as a result, the net job creation per firm is relatively high (38.1 and 30.5, for employment and value added, respectively). By using the Birch definition, the analysis is more selective and potentially more reliable in identifying firms that have a high impact on job creation.

Definitions that use change relative to previous periods yield better net job creation outcomes per firm. The literature shows that HPFs are overrepresented in young and growing industries (Davidsson and Delmar, 2006; Acs *et al.*, 2008), and in innovative industries (Eckhardt and Shane, 2011). For instance, HPF6 looks at the change that young firms undergo, from year one to year five of existence and how they sustain their growth. This measure is very selective as it imposes a more stringent threshold. It finds that few young firms pass the threshold (3,325 and 2,439) but those that pass the threshold grow and have relatively higher numbers of new (net) jobs in total (1.102 million and 890,899) and per firm (71.6 and 63.9, for employment and value added, respectively).

Figures 6 and 7 plot the share of firms with respect to all firms for employment and value added HPFs, respectively. HPFs that *generate more* net jobs also *destroyed more but* generate *less per firm and year* (with some exceptions). *All HPFs shed jobs in subsequent periods* after high growth episodes. Only young HPFs selected on value added are net job creators after high growth episodes. Jobs outcomes of value added HPFs are as good as employment HPFs (only slightly lower). However, *all HPFs selected on employment have negative labor productivity change* except for young HPFs. On the other hand, HPFs selected on value added increase productivity considerably. C*hange* HPFs created more net jobs, also per firm and year, but they also destroyed more jobs *during* and *after* growth episodes. Young firms destroyed less jobs after high growth episodes.

While OECD HPFs are selected on *growth* rates, net job creation and destruction are high. This is because the selection criterion is quite relaxed and the number of HPFs is high. However, net job creation per firm is the lowest. Birch HPFs are a mix of *change* and *growth* performance, as also reflected in the outcomes. The number of selected firms is relatively high but not excessive, net job creation is among the highest, and both net job creation per firm and productivity change rank in the middle compared to all other HPFs.

Requiring sustained growth, or selecting year-by-year rather than pooled, does not make much difference in outcomes. The advantage of running year-by-year is that it mitigates demand shock effects. Net job creation after high growth episodes is negative. This is for all definitions except for young HPFs selected on value added. Even in these cases where net job creation is positive, it is also relatively low. This result is highly associated with when the episode takes place in the lifecycle of the firm. First, it depends on the length of the panel and how close to the panel's end year the episode takes place, because this determines the number of years of potential job generation. But it also depends on whether the firm is in decline for causes external to the firm or through a transitory decline.

In summary, growth episodes are transitory occurrences in firms' lifecycle or a response to a demand shock. More worryingly, HPFs' performance reverses below zero. Only young V-HPFs create jobs (net) after high growth episodes. V-HPFs achieve not only similar employment outcomes to L-HPFs but increase productivity as well. Requiring firms to be young reduces the number of HPFs, but their individual performance is superior. Many HPFs are aligned to the OECD definition, but it is misleading. While it identifies 26 percent of firms and generates 70 percent of all net jobs, the average

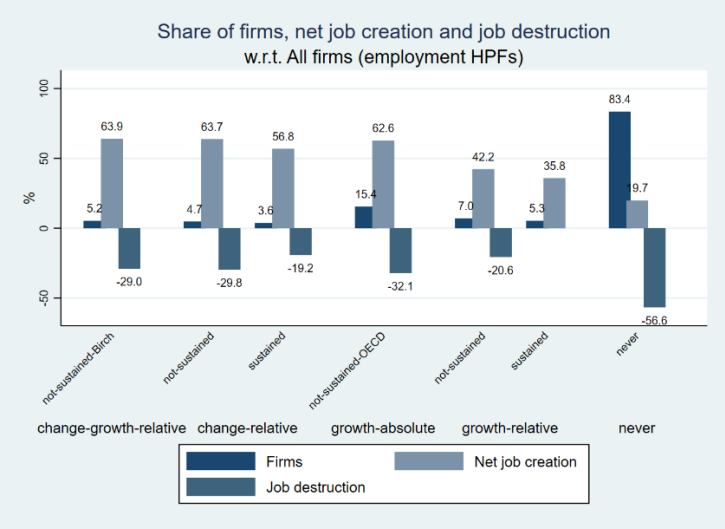
number of new jobs is only five above average. In contrast, 1 percent of young HPFs generate 26 percent of all net jobs, 26 more jobs than the average firm.

Table 5 Job creation across different definitions of both employment and value added HPFs

		EMPLOYMENT							VALUE ADDED						
		N. Firms	Av total employment per year	Net Job Creation	Net Job Creation per episode	Job Destruction	Change in labor productivity	Net Job Creation AFTER	N. Firms	Av total employment per year	Net Job Creation	Net Job Creation per episode	Job Destruction	Change in labor productivity	Net Job Creation AFTER
		317,988	5,982,688	4,426,253	2.7	-8378255	N/A	N/A	317,988	5,982,688	4,426,253	2.7	-8378255	N/A	N/A
		265,264	2,657,677	870,684	1.56	-4745521	N/A	N/A	233,238	2,231,743	723,559	1.67	-4418156	N/A	N/A
HPF1	change-relative-by year	14,937	1,997,346	2,820,633	41.5	-2495917	-23.8	(1,455,960)	13,291	1,907,905	2,471,948	35.4	-2119993	326.5	(1,002,489)
HPF2	change-relative	9,570	1,377,550	2,514,009	74.6	N/A	-62.1	(1,252,421)	9,337	1,352,004	2,256,095	50.8	-1777936	299.8	(714,081)
HPF3	change-sustained-relative-by year	11,564	1,425,620	2,514,562	48.9	-1609369	-41.1	(1,071,478)	9,461	1,246,689	2,031,844	41.3	-1355410	327.2	(646,141)
HPF4	change-sustained-relative	11,374	1,421,063	2,494,644	49.4	N/A	-42.2	(1,080,961)	9,495	1,272,977	2,040,993	41.1	-1348983	326.5	(643,769)
HPF5	change-young-relative	3,226	520,549	1,296,961	84.0	-726350	19.9	(57,051)	3,058	508,587	1,141,190	74.7	-598431	327.5	295
HPF6	change-sustained-young-relative	3,325	326,806	1,102,805	71.6	N/A	1.6	(65,237)	2,439	280,710	890,899	63.9	-404493	314.1	13,270
HPF7	change-age5-relative	5,555	486,329	1,750,190	40.9	-1569640	0.0	(135,331)	5,547	488,482	1,627,980		-1152537		38,542
HPF8	growth-relative-by year	22,343	778,794	1,866,122	22.2	-1730051	-47.4	(848,431)	24,343	624,525	1,383,597	13.5	-1328427	275.8	(456,351)
HPF9	growth-relative	9,714	383,060	1,190,326	37.1	-1113314	-75.6	(396,941)	9,419	247,742	692,483	18.5	-635339	317.7	(140,380)
HPF10	growth-sustained-relative-by year	16,992	592,128	1,585,748	25.4	N/A	-45.5	(646,218)	15,672	439,866	1,112,842	17.3	-879811	274.6	(325,183)
HPF11	growth-sustained-relative	16,843	593,596	1,562,642	25.4	N/A	-46.0	(655,837)	15,646	446,890	1,113,729	17.3	-884141	274.5	(330,071)
HPF12	growth-sustained1st-relative-by year	6,730	294,852	951,865	39.3	N/A	-68.7	(335,569)	5,860	179,732	554,147	23.3	-405790	323.9	(123,084)
HPF13	growth-relative-young	3,197	138,478	521,280	36.4	-383043	-13.8	(59,765)	3,058	95,249	302,656	21.9	-228938	307.4	(31,906)
HPF14	growth-sustained-young-relative	4,453	161,631	634,749	37.9	N/A	-15.0	(114,423)	4,111	106,776	381,899	22.1	-298890	309.5	(37,312)
HPF15	growth-absolute (OECD)	48,819	1,505,961	2,769,648	14.3	-2687137	-19.8	(1,447,738)	81,105	2,094,393	3,082,266	8.3	-3238698	202.0	(1,401,507)
HPF16	growth-absolute-sustained	36,830	1,141,371	2,411,094	17.0	N/A	-24.8	(1,089,836)	49,587	1,438,859	2,524,471	11.0	-2023163	205.8	(913,322)
HPF17	growth-absolute-consecutive sustained	8,897	356,670	992,853	28.7	N/A	-51.4	(311,535)	16,016	510,433	1,159,730	16.0	-842159	239.6	(317,712)
HPF18	change-growth-relative-by year (Birch)	16,670	1,890,211	2,827,198	38.1	-2433050	-33.8	(1,419,054)	16,255	1,833,904	2,529,511	30.5	-2112383	341.8	(976,701)

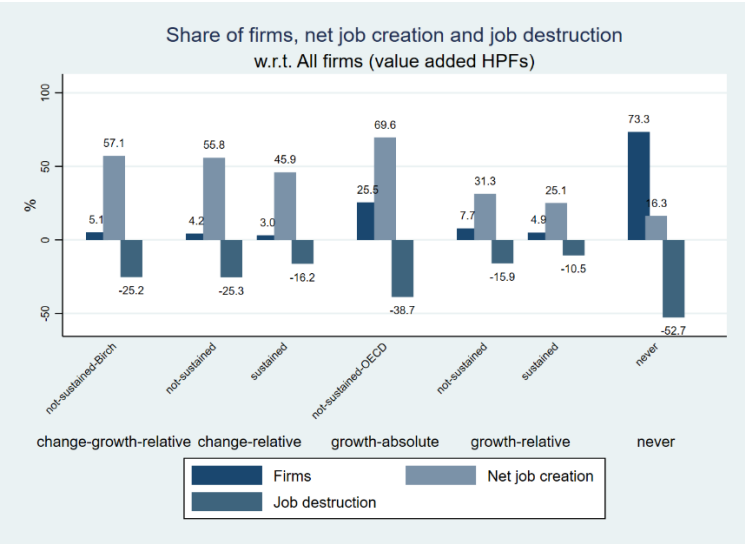
Source: Authors' elaborations based on EIS data

Figure 4 Share of firms, net job creation and job destruction, for employment HPFs



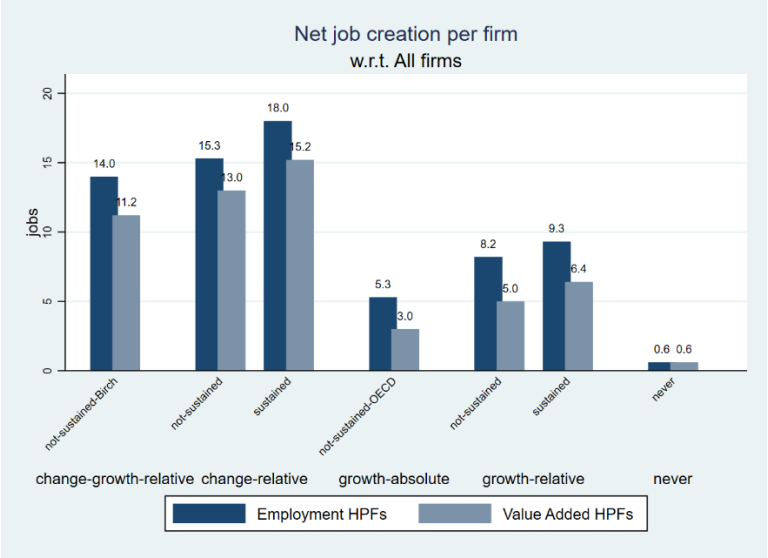
Source: Authors' elaborations based on EIS data

Figure 5 Share of firms, net job creation and job destruction, for value added HPFs



Source: Authors' elaborations based on EIS data

Figure 6 Net job creation per firm



Source: Authors' elaborations based on EIS data

Descriptive analysis provides a good starting point for understanding the characteristics of HPFs, but it might lead to erroneous conclusions if there is any correlation between the different determinants of growth. In other words, the impact of one variable may be capturing the impact of a related variable. This section analyzes the impact of determinants of growth, controlling for other factors that might lead to high growth. Analysis is undertaken (regression results in Annex 3 and Annex 4) to see if there are common features of firms that are more likely to de designated as HPFs. Though the analysis is not causal, the multivariate framework estimates the partial impact of a set of factors on the probability of becoming an HPF. The regression model is fairly limited since there are no indicators in data (such as infrastructure, networks, endogenous/unobservable characteristics like cronyism or entrenchment in sectors) that are drivers of productivity and inputs like access to capital and technology (human and physical). Therefore, the model should not be used as the model predicting HPFs by any means, but a framework for future elaboration of a more robust model.

The analysis provides a look at the characteristics associated with having the potential to be an HPF in the future. The employment growth, productivity, and productivity growth of an HPF after an episode with respect to a non-HPF are estimated by regression analysis. Because episodes identify high growth instances, by construction performance 'after' is below performance 'during'. Of interest is the comparison with firms that never have high growth episodes for a comparable period in the lifecycle of the firm. Thus, the regression analysis focuses on definitions that have restrictions on young firms (aged less than six) and compare performance after age five.

The analysis is done at the firm level at time t and sector s; it includes characteristics such as firm size (S), firm age (Ag), subsector (I), and it controls for year of data by using year dummies (Year). (I) are the industry fixed effects to control for demand-side differences. The covariates are a firm's characteristics in the initial year the firm enters the data, so this is entered just once. The intention is to learn the patterns that are robust and could help develop policies aimed at identifying HPFs. HPF

is a dummy variable that identifies the firms based on different definitions. The following equation is estimated:

$$HPF_{ist} = \beta_0 + \beta_{szk} * Sz_{ist} + \beta_{agm} * Ag_{ist} + \varphi Year_t + \theta I_s + \varepsilon_{ist} \quad (1)$$

Results show that HPFs selected on the amount of jobs or value added generated tend to be larger in size, while HPFs selected on growth rates tend to be evenly found across all size categories. This means that larger firms, apart from employing more people, are also more likely to become more productive. The age of the firm is also an interesting characteristic worth noting; HPFs are also more likely to be younger.

The sectoral association is important because the literature shows that increases in the prevalence of HPFs in a subsector has a positive effect on the subsequent growth of the subsector. Thus, increases in the number of HPFs serve as a signpost to subsequent sectoral growth (Bos and Stam, 2014). The opposite is not true; large sectors do not necessarily affect the number of HPFs in the sector. Thus, knowing the prominence of HPFs in a sector can help predict potential sectoral growth, a prediction that is very important to Turkey's policymakers.

We estimate an HPF's performance "*after*" high growth episodes to analyze whether episodes are transitory in nature. The dummy variable takes 1 if the firm is an HPF, 0 otherwise. All specifications control for 2-digit sector and year. For identification purposes, we only estimate the performance of young HPFs from six years old onwards. Our performance outcomes are productivity and employment and productivity growth.

$$\log(Yg)_{ist} = \beta_0 + HPF_j + \beta_{szk} * Sz_{ist} + \beta_{agm} * Ag_{ist} + \psi Yr_t + \theta I_s + \varepsilon_{ist} \quad (2)$$

Annex 4 presents regression results regarding identification (2). Young V-HPFs are more productive after 6 years old than their counterparts. In the case of L-HPFs, this is true for "change" HPFs but not for "growth". Coefficients are larger for V-HPFs, which are also more likely to grow faster but only in the case of "change" HPFs. A V-HPF is likely to grow in the order of 3 percent faster than a non-HPF. However, subsequent productivity growth is negative, thus performance reverts. These findings mirror those of L-HPFs. Employment growth reverts after episodes. Coefficients are all negative and significant, but productivity grows except in the case of HPF7 (05jcr).

Zooming-in on sectors and subsectors

The likelihood of certain sectors being more likely to have and produce HPFs depends on the outcome variable sought: employment or productivity rather than growth or change in levels. The main finding is that HPFs, in both dimensions (employment and productivity), can be found across all sectors, from low-skill requiring sectors to higher-skill requiring sectors. Annexes 5 and 6 show the breadth of subsectors with HPFs. Many manufacturing subsectors and some service subsectors are more prominent. Given the breadth of representation of sectors, there is no clear need to overly specialize in a few subsectors to catalyze job creation and/or increase productivity. Turkey can still reach its economic growth potential with an economy that is sectorally diversified.

Firms entering the mining, construction and utilities subsectors are more likely to become L-HPFs (no matter what definition is used) and V-HPFs when the focus is on growth of productivity. This indicates that these subsectors are more likely to grow in terms of employment creation but less so in

terms of productivity. Firms entering the textiles and apparels subsector have a lower likelihood of becoming L-HPFs or V-HPFs. This indicates that the textiles and apparel subsectors have fewer firms that contribute to net job creation or productivity improvements in Turkey. Manufacturing (except textiles and apparel, and furniture) as a broad sector has many V-HPFs across all definitions and L-HPFs across growth definitions. This finding indicates that firms entering the sector have a better likelihood of experiencing not only productivity growth and change over their lifetime but also growth in employment. But the manufacturing sector contains a broad set of distinct subsectors, and some are more likely to have HPFs than others.

Firms in transport and communications are also likely to become V-HPFs. This subsector has many productive companies, and firms entering the subsector need to invest significant resources to enter and be competitive from the start to remain in business. Firms in transport are also likely to become L-HPFs and contribute to net job creation in Turkey. Given the heterogeneity of outcomes across subsectors, it is important to go beyond broad sectoral categories and differentiate between subsectors (see next section). The results from the furniture subsector are mixed and too dependent on the definition that is used; this may indicate that the sector is too heterogenous and firms in the sector may or may not be productive and/or may range broadly in size and employment growth potential.

Some subsectors have a high incidence of V-HPFs and low incidence of L-HPFs, and several rely on productivity improvements to grow and remain competitive. Productivity is considered a key source of economic growth and competitiveness. As such, the economy benefits immensely from having an increasing incidence of V-HPFs because they not only improve the productivity of the subsector through their own high productivity, but they also serve as role models and impact the behavior of other firms in the subsector. They do so without increasing employment in the subsector, but their economic contribution is likely to have positive spillovers on the economy.

The services sector occupies an increasingly important position in the Turkish economy, with its share rising from 46 percent to 54 percent, between 2004 and 2017. This analysis separates commerce, business, finance, and tourism from other services to enable a deeper dive into each of them. The analysis finds that firms entering the commerce, business and finance subsectors are unlikely to become L-HPFs and contribute substantially to net job creation (as shown by the negative coefficient in L-HPFs), but the picture is less clear in terms of whether they will become productive firms or not. In the case of commerce, a significant number of firms have passed the productivity thresholds across definitions, indicating that firms entering commerce are more likely to become V-HPFs.

Tourism (namely hotels and restaurants) is a services subsector that employs many people. Unfortunately, the results show a mixed picture; almost always negative (or not contributing) in terms of productivity and limited contribution in terms of employment. For many 'other services' subsectors, the results are more favorable, with new firms likely to become L-HPFs and/or V-HPFs.

V-HPFs have some interesting overlaps with L-HPFs, indicating that firms in some subsectors (2-digit sector code) not only create more jobs but are also more productive. It is understandable if the overlap between V-HPFs and L-HPFs is limited, because many V-HPFs are capital intensive and employ few workers (Bos and E. Stam, 2011). Those firms achieve substantial value added without many workers and their per capita value added is high compared to other less capital-intensive firms and sectors. Table 6 shows detailed subsubsector results (4-digit sector code) that can guide

policymakers to identify specific subsector outcomes. Subsectors listed in the middle category are those that have a high incidence of HPFs in employment and productivity. These are subsectors that are likely contributing positively to the economy in more ways than one, several of which are in the manufacturing and services sectors.

Table 6 Sectoral overlapping between employment and value added HPFs

Employment	Employment-Value Added	Value added
42. Civil engineering	51. Air transport	28. Mfg. of machinery & equipment
87. Residential care activities	62. Computer programming, consultancy and related activities	25. Mfg. of fabricated metal products, except machinery and equipment
11. Mfg. of beverages	22. Mfg. of rubber and plastic products	17. Mfg. of paper and paper products
	23. Mfg. of other non metallic mineral products	30. Mfg. of other transport equipment
	80. Security and investigation activities	
	81. Services to buildings and landscape activities	
	91. Libraries, archives, museums etc.	
	29. Mfg. of motor vehicles etc.	
	21. Mfg. of basic pharmaceutical products etc.	
	26. Mfg. of computer, electronic and optical products	
	86. Human health activities	
	20. Mfg. of chemicals and chemical products	

Source: Authors' results using EIS data
Note: OECD definition was chosen for identifying HPFs.

Besides positive spillovers of HPFs in the economy, there might be negative ones. The competition in output and input markets may be increased by the presence of HPFs. Stronger competition in the output markets would lead competitors to operate at a lower scale or cut prices. Similarly, higher competition in input markets would imply that competitors may face higher wages and/or material costs. In either case, the presence of HPFs may curtail the growth of other firms operating in the subsector.

Linking HPFs with vulnerability of jobs

One important aspect that this part of the analysis does not delve into, due to data limitations, is whether the new jobs created are temporary or permanent in nature. Given the increasing prevalence of temporary contracts in Turkish firms and the fact that they are, on average, less expensive (and often less skilled) for the firm, some L-HPFs may be growing largely because they hire many temporary formal workers. This can have an effect on the firm's productivity potential because permanent workers are likely to be more skilled and/or have a higher probability of receiving training than temporary workers (Dolado and Stucchi 2008), which affects productivity. In fact, a study for high growth firms in Spain finds that the mix of contracts offered (as well as other human resource practices) is an important determinant of fast growth (Lopez-Gracia and Puente, 2012). Having more temporary formal workers, versus permanent ones, can explain why it is possible that L-HPFs are not also V-HPFs. Fortunately, the JQI differentiates (in terms of job vulnerability) between jobs that are formal permanent, formal temporary and informal; it is one of the thirteen dimensions, and vulnerability values are assigned accordingly. Therefore, through the JQI one can indirectly infer the types of jobs that are being offered by HPFs.

Interestingly, several of those subsectors also offer good quality jobs, indicating that some subsectors in Turkey are performing well in terms of productivity, job creation and good quality jobs. Table 7 shows that 'air transport', 'computer programming, consultancy and related services', 'manufacture of pharmaceuticals', manufacture of computer, electronic and optical products' and 'security and investigation' services are subsectors that are not contributing to net job creation and productivity but also offer good quality jobs. These are subsectors that should be supported by ensuring the enabling environment is conducive for new firms to enter and existing firms to continue to grow and perform.

Some subsectors have HPFs but offer vulnerable, working conditions and welfare should be improved. It will be important to investigate further which dimension(s) of job quality need to be improved in those subsectors to ensure workers can benefit from their growth and success. These dimensions could, for example, be related to underemployment, working hours (too many or too few), low wages or limited wage growth, limited career growth, hazardous conditions, high levels of informality, among other factors.

The table also shows that other subsectors not only offer vulnerable jobs, but they are also not improving in terms of employment growth or productivity growth. These are subsectors that may be absorbing (wasting) human resources without positive prospects. For example, 'manufacture of furniture' and manufacturer of textiles and apparel', 'land transport and transport via pipelines'.

Table 7 Linking HPFs with job quality index

	NON-HPFs	HPFs
Type 1	60. Programming and Broadcasting 63. Information service activities 77. Rental and leasing activities 20. Mfg. of chemical and chemical products	51. Air transport 21. Mfg. of basic pharmaceutical products, pharma prep. 62. Computer programming, consultancy & related services 26. Mfg. of computer, electronic and optical prod. 80. Security and investigation
Type 2	10. Mfg. of food products 13. Mfg. of textiles 31. Mfg. of furniture 49. Land transport and transport via pipelines 25. Mfg. of fabricated metal products, except machinery and equipment	12. Mfg. of tobacco products 81. Services to buildings and landscape activities 42. Civil engineering 91. Libraries, archives, museums and other cultural 23. Mfg. of other non-metallic mineral products 86. Human health activities

Source: Authors' results using EIS and Household Labor Force data
Note: OECD definition was chosen for identifying HPFs.
"Type 1" sectors offer jobs with social security, more permanent nature, whereas "Type 2" sectors offer more vulnerable jobs, indicating working conditions and welfare should be improved.

This analysis shows how important it is to delve into the subsectors to understand which ones perform well and which ones do not. The analysis in the previous section showed that the transport sector has many HPFs, and firms entering that sector are likely to become HPFs. However, the sector contains many subsectors and, as a result, the performance of firms entering the sector depends widely on the subsector. For instance, the analysis shows that firms in the air transport subsector perform very well in terms of employment, productivity and job vulnerability. The opposite is true for firms in the land transport and transport via pipelines sub-subsectors. Similarly, the manufacturing sector is also heterogenous. Firms manufacturing pharmaceutical products are likely to be HPFs while firms manufacturing food products are likely to perform less well across the board.

There are various drawbacks of this study; one of them is that it is not possible to know certain important firm characteristics that may influence firm performance. For instance, the literature shows that owners' or managers' quality and motivation can positively influence firm performance. In fact, evidence shows that when managers and/or owners have growth-oriented mindsets, firms are more likely to grow and attract better management and investment. The opposite is also important; some firm owners may not actively seek to grow their firms, preferring to remain smaller (for different reasons), and thus it is highly unlikely that they will create many jobs and grow. There is also evidence that human resource practices matter for growth and performance. However, the data does not contain variables that allow any of these dimensions to be measured.

Another drawback from using this data is that there is no information on which firms benefited from government programs that may have influenced firm growth and performance. Firms may grow while they are under the support of government programs, but they may stop growing once the support ends. Thus, their growth is subsidized, and their performance is not solely a result of their internal dynamics.

5. Conclusions

A subset of firms in the Turkish economy are defined as high performing in terms of growth in either job creation or productivity, or both. As early movers with respect to the recognition and realization of sector-specific growth opportunities, HPFs are at the core of Turkey's net job creation. They create many of the new jobs in the economy, especially L-HPFs, and contribute to economic dynamism and growth. But there is a lot of churning (unless the definition used requires sustainability of employment), and even though HPFs create more net jobs than non-HPFs, they also contribute to job destruction as part of their growth process. The presence of HPFs in a sector is a predictor of subsequent growth.

Knowing the prominence of HPFs in a sector can help predict potential sectoral growth, a prediction that is very important to Turkey's policymakers. The analysis in this paper shows that the growth patterns among firms are heterogeneous and that fast-growing firms contribute to job creation and the economy more broadly. The definition used to classify HPFs matters a lot for whether a firm is selected as an HPF as there are not many overlaps of firms between definitions, and top performance is rarely maintained over long spells. As such, HPFs require policies to provide effective supportive measures to sustain their successful performance. Such policies should enable them to enter the formal economy, encourage and promote growth-oriented entrepreneurship, and support their continual transformation.

While countries around the world often look for the sectors that will drive economic growth, doing so accurately is, unfortunately, very difficult. This is because the future is uncertain, there is a lack of information on the optimal economic structure and future economic outcomes, and vested interests get embedded in the selection process, among other reasons. This paper aims to help the government of Turkey measure the magnitude of HPFs and ascertain the likelihood that economic subsectors will have large numbers of HPFs. The results are not meant to be used to implement industrial policy; however, they can contribute to improving the evidence base for Turkey to better target its financial and non-financial support in a more objective manner.

HPFs are more likely to be younger, meaning that being young is associated with rapid growth. Young firms can be drivers of structural economic change. Not all young firms become HPFs but those that do become HPFs, grow and have higher net job creation. Young firms are important in economies when incumbents have low or stagnant performance and have too much to lose by giving up their vested interests in long established markets (Christensen, 1997). One clear lesson is that removing the barriers to the growth of new firms is a necessary step to ease the enabling environment.

A large segment of HPFs, identified using more stringent definitions, are larger in size. This means that larger firms, apart from employing more people, are also more likely to become more productive. In Turkey, about 77 percent of firms that start large stay large in the first five years. These firms make significant investments upon entering the market. It can be argued that bigger firms have more opportunities to further develop their competitive advantages and to successfully implement a fast growth strategy. But many large firms are also slow to adapt to structural changes and their existence (and ability to remain operational) depends less on their own internal performance and more on various forms of support they receive from government.[5]

Subsets of small and medium firms are also identified as HPFs under some definitions. In fact, most firms enter the Turkish economy small (less than 20 workers). Unfortunately, only a subset of these firms grow in the first five years and many exit before five years. However, the number of SMEs that enter the Turkish economy far exceed the number of large firms that enter. Therefore, SMEs should also be considered a core element in the economic growth and job creation strategy in Turkey, especially SMEs in those subsectors with a high incidence of HPFs.

This paper shows that HPFs, in both dimensions studied (labor and productivity), exist in all (broad) sectors, though not across all subsectors. There are interesting overlaps between productivity and employment high performance, highlighting that there are (firms in) subsectors that not only create more jobs but are also more productive. HPFs are not overrepresented in high-technology sectors, but they are overrepresented in manufacturing and some service subsectors. They include subsectors requiring lower skills and subsectors requiring higher skills. Many subsectors in the manufacturing sector and some subsectors in services are more prominent.

A subset of subsectors with a high incidence of HPFs also excel in terms of the quality of jobs they offer. This indicates that some subsectors in the Turkish economy perform well in terms of productivity, job creation and good quality jobs. Interestingly, these are not only high-tech sectors but also traditional sectors. In the services sector, air transport; computer programming, consultancy, and related services; and security and investigation are the top subsectors in terms of high performance and quality of jobs. In the manufacturing sector, basic pharmaceutical products and pharmaceutical preparation; and computers, electronics, and optical products are the most salient subsectors in terms of performance and quality jobs. Firms in some of these subsectors are likely to be young, R&D intensive, and developing or implementing new technologies, e.g., biotech and pharmaceutical production, and computers and electronics. While others, such as air transport and security and investigation are long established but may be undergoing renovation, sectoral change and experiencing increasing demand. These subsectors should not only be nurtured for further growth, but they should also be studied to learn what enables them to perform successfully.

[5] To receive support from government for a firm does not mean that the firm is state owned enterprise.

Establishing the right incentives and promoting role models can be a crucial strategy to enable more firms to become high performers. More knowledge of the factors stimulating or hindering fast growth can help guide policymakers in the kind of support—financial and non-financial measures—. Some subsectors have large concentrations of HPFs and offer good quality jobs while others have none/few and offer low quality jobs. Thus, non-financial support measures will require policy reforms that include policies to strengthen the labor market and the 'doing business' environment.

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Annex

Annex 1 Overlapping across different L-HPFs

					CHANGE							GROWTH							OECD			BIRCH
	HPF	HPFj		N	tt3jcry HPF1	tt3jcr HPF2	tt3scry HPF3	tt3scr HPF4	15jcr HPF5	15cr HPF6	05jcr HPF7	tt3jgry HPF8	tt3jgr HPF9	tt3sgry HPF10	tt3sgr HPF11	tt3Sgry HPF12	15jgr HPF13	15sgr HPF14	tt3jga HPF15	tt3sga HPF16	tt3sgA HPF17	tt1cgry HPF18
CHANGE	HPF1	tt3jcry	**change**	14937		64	77	74	21	22	28	64	43	51	50	32	14	19	84	67	27	91
	HPF2	tt3jcr	best episode	9570	100		79	79	29	28	38	66	48	52	52	36	17	22	85	68	30	98
	HPF3	tt3scry	sustain	11564	100	65		95	23	29	28	66	44	65	64	41	16	21	85	85	35	93
	HPF4	tt3scr	sustain pooled	11374	97	66	96		23	29	28	65	44	64	64	41	16	21	85	84	35	92
	HPF5	15jcr	young	3226	99	87	83	83		72	77	68	51	57	56	40	51	51	86	72	30	97
	HPF6	15scr	young sustain	3325	100	81	100	100	70		59	72	53	72	71	50	43	56	90	89	33	98
	HPF7	05jcr	entry, age5	5555	74	65	58	58	45	35		35	24	28	28	18	19	21	52	42	16	66
GROWTH	HPF8	tt3jgry	**growth**	22343	43	28	34	33	10	11	9		43	76	72	30	14	20	100	78	31	56
	HPF9	tt3jgr	best episode	9714	66	47	53	52	17	18	14	100		78	78	69	28	39	100	79	40	88
	HPF10	tt3sgry	sustained	16992	44	29	44	43	11	14	9	100	45		94	40	16	22	100	100	41	59
	HPF11	tt3sgr	sustained pooled	16843	45	30	44	43	11	14	9	95	45	95		40	16	22	100	100	41	59
	HPF12	tt3Sgry	only sustain	6730	71	51	70	69	19	25	15	100	100	100	100		32	43	100	100	53	94
	HPF13	15jgr	young	3197	68	50	58	58	52	45	34	98	86	84	84	68		91	99	85	41	86
	HPF14	15sgr	young sustain	4453	64	47	55	54	37	42	26	100	85	84	84	65	65		100	85	35	86
OECD	HPF15	tt3jga	**absolute**	48819	26	17	20	20	6	6	6	46	20	35	35	14	6	9		75	18	31
	HPF16	tt3sga	sustained	36830	27	18	27	26	6	8	6	47	21	46	46	18	7	10	100		24	33
	HPF17	tt3sgA	consecutive	8897	46	32	45	45	11	12	10	78	44	78	78	40	15	18	100	100		57
BIRCH	HPF18	tt1cgry	birch	16670	81	56	64	63	19	20	22	76	51	60	60	38	17	23	91	73	30	

Source: Authors' results using EIS data

Note: The share of firms identified as a gazelle in a row that are also a gazelle in the definition used in the column. The number of firms identified as a gazelle for each row is given in the first column. The shading is to help bring out where overlaps are more or less common.

Annex 2 Overlaps across different L-HPFs and V-HPFs

					CHANGE							GROWTH							OECD			BIRCH
	HPF	HPFj		N	tt3jcry HPF1	tt3jcr HPF2	tt3scry HPF3	tt3scr HPF4	15jcr HPF5	15cr HPF6	05jcr HPF7	tt3jgry HPF8	tt3jgr HPF9	tt3sgry HPF10	tt3sgr HPF11	tt3Sgry HPF12	15jgr HPF13	15sgr HPF14	tt3jga HPF15	tt3sga HPF16	tt3sgA HPF17	tt1cgry HPF18
change	HPF1	tt3jcry	**change**	14937		41	39	39	13	11	20	41	20	31	31	15	8	9	80	60	29	57
	HPF2	tt3jcr	best episode	9570	64		49	49	17	14	26	44	23	34	34	17	9	11	81	62	31	69
	HPF3	tt3scry	sustain	11564	55	44		44	15	12	21	43	20	36	36	17	9	10	82	67	34	60
	HPF4	tt3scr	sustain pooled	11374	55	44	45		15	12	22	43	20	36	36	17	9	10	82	68	35	60
	HPF5	15jcr	young	3226	63	53	50	50		33	47	51	28	41	41	23	26	25	84	67	34	71
	HPF6	15cr	young sustain	3325	56	46	46	46	34		36	53	29	45	45	25	22	27	85	71	34	67
	HPF7	05jcr	entry, age5	5555	65	55	48	48	33	24		28	14	22	22	11	11	11	62	47	21	62
growth	HPF8	tt3jgry	**growth**	22343	22	16	17	17	5	5	6		20	35	35	15	7	9	88	62	30	32
	HPF9	tt3jgr	best episode	9714	31	23	24	24	7	7	8	64		48	48	24	12	15	91	66	37	46
	HPF10	tt3sgry	sustained	16992	24	17	20	20	6	5	6	48	20		39	17	8	10	89	70	35	34
	HPF11	tt3sgr	sustained pooled	16843	24	17	20	20	6	5	6	48	20	40		17	8	10	90	70	36	34
	HPF12	tt3Sgry	only sustain	6730	34	25	28	28	9	8	9	67	34	56	56		14	18	92	74	43	50
	HPF13	15jgr	young	3197	35	27	28	28	21	17	17	71	39	57	58	32		35	92	72	42	53
	HPF14	15sgr	young sustain	4453	31	24	24	24	15	15	14	68	37	53	54	29	26		91	68	35	48
OECD	HPF15	tt3jga	**absolute**	48819	16	11	12	13	4	3	5	32	12	23	23	9	4	6		56	23	22
	HPF16	tt3sga	sustained	36830	18	13	14	15	4	4	5	33	13	26	26	10	5	6	83		27	24
	HPF17	tt3sgA	consecutive	8897	27	20	23	24	6	6	7	47	20	41	41	17	8	9	91	77		37
birch	HPF18	tt1cgry	birch	16670	44	34	34	34	11	9	16	46	21	35	35	16	8	10	84	63	31	

Source: Authors' results using EIS data

Note: The share of firms identified as a gazelle in a row that are also a gazelle in the definition used in the column. The number of firms identified as a gazelle for each row is given in the first column. The shading is to help bring out where overlaps are more or less common.

Annex 3 Determinants of being HPFs

Determinants of being a High Performance Firm (at start)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	tt3jcry	tt3scry	tt3jgry	tt3sgry	OECD	Birch	tt3jcry	tt3scry	tt3jgry	tt3sgry	OECD	Birch
	HPF1L	HPF3L	HPF8L	HPF10L	HPF15L	HPF18L	HPF1rV	HPF3rV	HPF8rV	HPF10rV	HPF15rV	HPF18rV
sz_20to49	0.112***	0.0816***	0.0345***	0.0265***	0.0781***	0.0874***	0.0992***	0.0685***	0.0337***	0.0315***	0.0691***	0.0953***
	(0.00384)	(0.00342)	(0.00601)	(0.00460)	(0.00757)	(0.00385)	(0.00757)	(0.00535)	(0.00469)	(0.00274)	(0.00600)	(0.00486)
sz_50to99	0.363***	0.289***	0.103***	0.0807***	0.122***	0.283***	0.329***	0.257***	0.0527***	0.0554***	0.0804***	0.264***
	(0.0126)	(0.0145)	(0.0111)	(0.00886)	(0.0113)	(0.0104)	(0.0188)	(0.0158)	(0.00861)	(0.00787)	(0.00700)	(0.0127)
sz_100to499	0.616***	0.506***	0.120***	0.0972***	0.119***	0.483***	0.564***	0.465***	0.0618***	0.0658***	0.0691***	0.460***
	(0.0232)	(0.0294)	(0.0139)	(0.0121)	(0.0131)	(0.0190)	(0.0243)	(0.0234)	(0.0118)	(0.00926)	(0.00873)	(0.0199)
sz_500plus	0.790***	0.622***	0.0881***	0.0856***	0.0783***	0.709***	0.834***	0.667***	0.0236*	0.0481***	0.0238	0.711***
	(0.0239)	(0.0437)	(0.0134)	(0.0139)	(0.0224)	(0.0215)	(0.0174)	(0.0195)	(0.0137)	(0.0131)	(0.0217)	(0.0219)
age10_19	-0.00773**	-0.00917***	-0.0198***	-0.0276***	-0.0119*	-0.0145***	-0.00159	-0.00294**	-0.0531***	-0.0443***	-0.0271***	-0.0223***
	(0.00316)	(0.00193)	(0.00494)	(0.00331)	(0.00652)	(0.00399)	(0.00214)	(0.00122)	(0.00391)	(0.00205)	(0.00554)	(0.00265)
age20_29	-0.0114**	-0.0113***	-0.0435***	-0.0424***	-0.0495***	-0.0228***	-0.00397	-0.00283	-0.0736***	-0.0523***	-0.0733***	-0.0281***
	(0.00466)	(0.00287)	(0.00941)	(0.00593)	(0.0115)	(0.00486)	(0.00484)	(0.00200)	(0.00536)	(0.00380)	(0.00670)	(0.00486)
age30plus	-0.0259***	-0.0233***	-0.0841***	-0.0687***	-0.137***	-0.0473***	-0.0154***	-0.0131***	-0.0905***	-0.0602***	-0.152***	-0.0389***
	(0.00581)	(0.00451)	(0.00834)	(0.00712)	(0.0158)	(0.00728)	(0.00502)	(0.00379)	(0.0108)	(0.00572)	(0.0170)	(0.00542)
MinUtilConstr	0.0338***	0.00563*	0.0971***	0.0330***	0.0539***	0.0596***	-0.0145**	-0.0127***	0.0622***	0.0257***	0.0452***	0.00771
	(0.00657)	(0.00332)	(0.0141)	(0.00798)	(0.00896)	(0.00947)	(0.00634)	(0.00376)	(0.0158)	(0.00831)	(0.00406)	(0.00711)
TextApparel	-0.0175***	-0.0125***	-0.0150***	-0.0118**	-0.0534***	-0.0165***	-0.0258**	-0.0121	-0.0338***	-0.00866	-0.0214	-0.0328*
	(0.00436)	(0.00354)	(0.00458)	(0.00472)	(0.0136)	(0.00508)	(0.0118)	(0.00740)	(0.00781)	(0.00636)	(0.0173)	(0.0168)
Furniture	-0.0205***	-0.0123***	0.0220***	0.0168***	0.0349***	-0.0123***	-0.0343***	-0.0177***	0.0123***	0.0319***	0.0620***	-0.0374***
	(0.00139)	(0.000938)	(0.00212)	(0.00141)	(0.00153)	(0.00119)	(0.00341)	(0.00206)	(0.00365)	(0.00471)	(0.00196)	(0.00372)
Other Manuf	-0.00195	0.000306	0.0162***	0.0127***	0.0254***	0.00491	0.0242***	0.0203***	0.0328***	0.0384***	0.0796***	0.0413***
	(0.00339)	(0.00250)	(0.00537)	(0.00443)	(0.00755)	(0.00480)	(0.00622)	(0.00453)	(0.00637)	(0.00598)	(0.00465)	(0.00928)
Commerce	-0.0131***	-0.0107***	0.0118*	0.00424	-0.00916**	-0.00427	0.00806	0.00484	0.00696	0.00727	0.0275***	0.0169
	(0.00295)	(0.00305)	(0.00608)	(0.00461)	(0.00464)	(0.00396)	(0.0151)	(0.00782)	(0.00682)	(0.00462)	(0.00729)	(0.0186)
TranspCommun	0.00942	0.00138	0.0616**	0.0362	0.0438	0.0283*	0.00625	0.00794	0.0608***	0.0467***	0.0662***	0.0262*
	(0.00940)	(0.00525)	(0.0292)	(0.0220)	(0.0448)	(0.0170)	(0.00794)	(0.00501)	(0.0171)	(0.0137)	(0.0202)	(0.0144)
Hotel&Rest	-0.00226	-0.00530	0.0209***	0.0104	-0.0103	0.00885	-0.0364***	-0.0185***	0.0293**	0.0122	0.0140	-0.0285*
	(0.00857)	(0.00688)	(0.00703)	(0.00735)	(0.00772)	(0.00901)	(0.00887)	(0.00540)	(0.0147)	(0.0100)	(0.0189)	(0.0173)
Bus&Fin	-0.00289	-0.00103	-0.00745	-0.00125	-0.0705***	0.00105	0.0135	0.000655	0.00205	-0.00462	-0.0592***	0.0233*
	(0.00818)	(0.00685)	(0.00804)	(0.00822)	(0.0138)	(0.00726)	(0.0113)	(0.00491)	(0.0126)	(0.00734)	(0.0208)	(0.0131)
OtherServ	0.0300**	0.0124	0.0752***	0.0438***	0.0462**	0.0456**	-0.00187	-0.000847	0.0844***	0.0561***	0.0741***	0.0283***
	(0.0151)	(0.00787)	(0.0259)	(0.0159)	(0.0230)	(0.0200)	(0.00794)	(0.00512)	(0.0182)	(0.0145)	(0.0109)	(0.0106)
Year dummy	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	173,997	181,681	178,444	184,854	185,325	175,049	170,930	180,486	177,477	183,366	196,211	172,636

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' results using EIS data

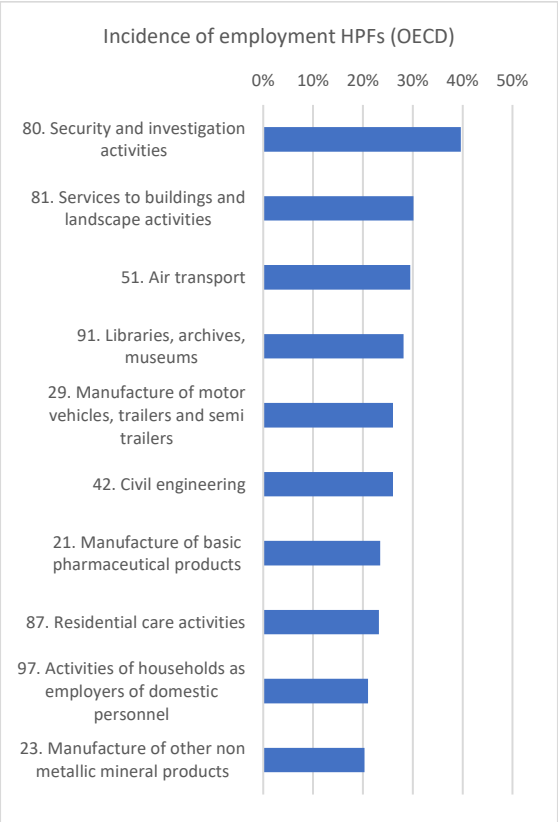
Annex 4 Performance after growth episodes

Turkey: After vs. Never (age>=6)

			Labor Productivity (log)		Employment Growth		Labor Productivity Growth	
Employment	HPF5L	15jcr	0.352***	(0.101)	-0.0269*	(0.0142)	0.0132**	(0.00573)
	HPF6L	15cr	0.283***	(0.0887)	-0.0133	(0.0134)	0.0162***	(0.00556)
	HPF7L	05jcr	0.626***	(0.109)	-0.0208*	(0.0118)	0.00283	(0.00473)
	HPF13L	15jgr	0.111	(0.0724)	-0.0408***	(0.0143)	0.0402***	(0.00516)
	HPF14L	15sgr	0.0487	(0.0651)	-0.0496***	(0.0137)	0.0344***	(0.00407)
Value Added	HPF5rV	15jcr	1.218***	(0.0784)	0.0279***	(0.00982)	-0.0560***	(0.00727)
	HPF6rV	15cr	1.043***	(0.0663)	0.0304**	(0.0125)	-0.0350***	(0.00574)
	HPF7rV	05jcr	1.382***	(0.0628)	0.0383***	(0.00515)	-0.0525***	(0.00489)
	HPF13rV	15jgr	0.315***	(0.0588)	-0.00662	(0.0134)	-0.0337***	(0.0105)
	HPF14rV	15sgr	0.206***	(0.0483)	-0.0167	(0.0113)	-0.0169*	(0.0102)

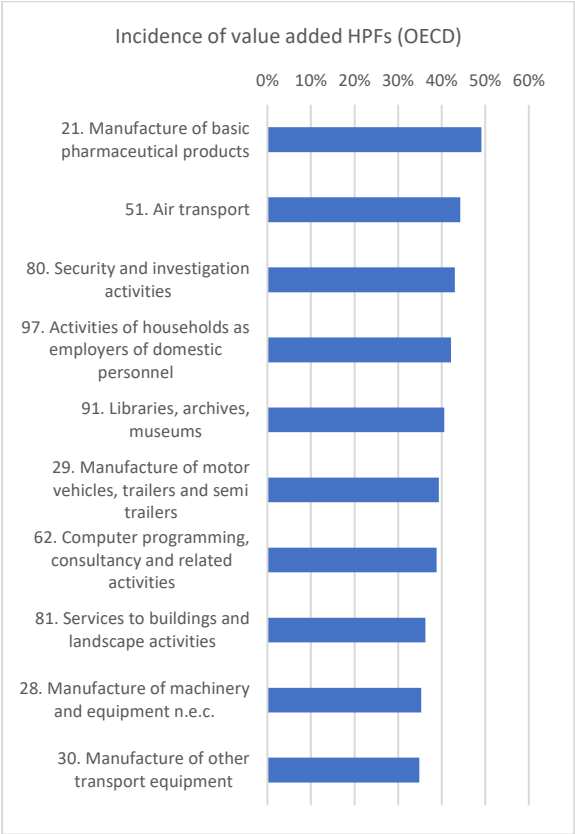
Source: Authors' results using EIS data
Note: Standard deviations are in parenthesis.

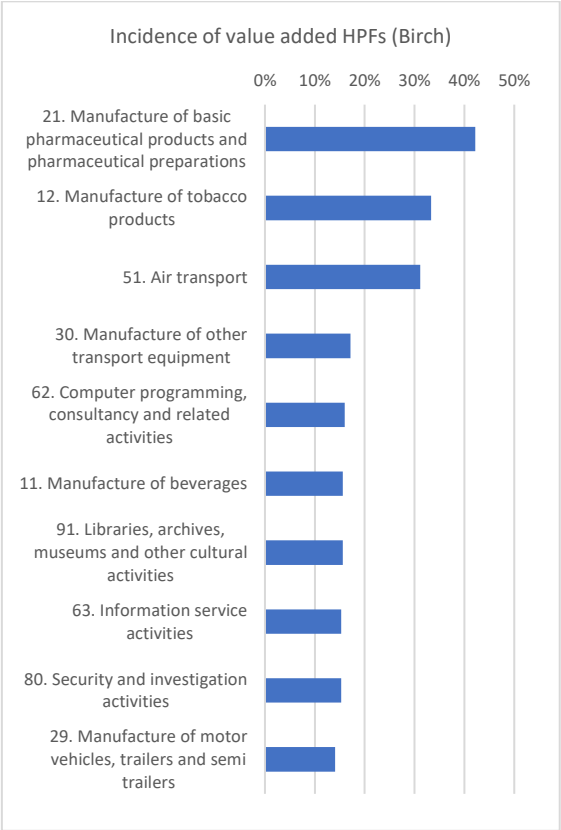
Annex 5 Top 10 sectors with high incidence of having L-HPFs



Source: Authors' results using EIS data

Annex 6 Top 10 sectors with high incidence of having V-HPFs





Source: Authors' results using EIS data

Annex 7 Descriptive characteristics of HPFs

		Number of firms	Number of firms -never become L HPFs	Number of firms -never become V HPFs
	Total	317,988	265,264	233,238
Sector	Manufacture	78,745	63,296	53,331
		24.8%	23.9%	22.9%
	Construction	54,809	46,433	42,581
		17.2%	17.5%	18.3%
	Services	184,434	155,535	137,326
		58.0%	58.6%	58.9%
Firm's age	1	185,005	156,744	138,987
		58.2%	59.1%	59.6%
	2-5	36,329	27,483	22,474
		11.4%	10.4%	9.6%
	6-9	32,439	26,088	22,266
		10.2%	9.8%	9.5%
	10-19	54,364	46,001	41,221
		17.1%	17.3%	17.7%
	20-29	8,107	7,331	6,776

		2.5%	2.8%	2.9%
	30+	1,744	1,617	1,514
		0.5%	0.6%	0.6%
Firm's size	1-19	215,441	185,185	164,369
		67.8%	69.8%	70.5%
	20-49	75,051	61,923	52,644
		23.6%	23.3%	22.6%
	50-99	15,100	11,686	9,863
		4.7%	4.4%	4.2%
	100-499	10,904	5,966	5,851
		3.4%	2.2%	2.5%
	500+	1,492	504	511
		0.5%	0.2%	0.2%

Source: Authors' results using EIS data