

The (Un) intended consequences of institutions lowering barriers to entrepreneurship: the impact on female workers

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INTRODUCTION

The concept of barriers to venture formation is central to both entrepreneurship and strategy research, which has increasingly recognized the key role the institutional environment plays in facilitating or hindering the founding of a startup. Entrepreneurship scholars have long linked regulatory changes, which ease the access to capital and other resources when forming and nurturing a new venture, to higher rates of new foundings and greater quality of new ventures, conditional on entry (e.g., Armour and Cumming 2008, Chatterji et al., 2012; Eberhart et al. 2017, Eesley 2016). At the same time, strategy scholars have recognized the threat that such changes impose on incumbent firms, whose competitive advantage might be eroded because market competition intensifies (Porter, 1980), and valuable employees move to startups (e.g., Agarwal et al., 2004; Agarwal et al., 2015; Hall, 1993; Lippman and Rumelt, 1982).

However, past studies have only focused on individuals who leave for entrepreneurship (e.g., Eberhart et al. 2017; Eesley 2016), contributing to the relevant loss of human capital for incumbent firms (e.g., Agarwal et al., 2015; Campbell et al., 2011). Yet not all employees will become founders when entry barriers to forming new ventures fall; indeed, many will stay behind at incumbent firms. Though little attention has been devoted to such “stayers,” these employees may suffer the *unintended* consequences, which alter the ways in which rent is appropriated inside an established organization. Strategy researchers have recognized that rent allocation among employees is of key importance for a firm’s ability to achieve and sustain its competitive advantage (Blyler and Coff, 2003; Qian et al., 2017). But when certain groups of employees leave to become founders, some “stayers” might witness a significant yet unforeseen impact on their ability to create and capture value. Hence, the following research questions are critical: what types of employees leave the company when barriers to entry are reduced and, among those who stay put, what types of employees are most affected by these departures and how?

To advance the understanding of the effects of regulations that reduce entry barriers, we develop a more comprehensive theory regarding their intended and unintended consequences: the former

pertaining to employees who become founders, and the latter pertaining to employees who stay behind at incumbent firms. First, turning our attention to the intended effects, we predict that entry rates will increase most starkly among historical minority groups, such as women, who tend to be most disadvantaged at the point of entry and thus will benefit the most from lower barriers. Women have been found to face greater obstacles than men when transitioning into entrepreneurship, including difficulties raising sufficient capital or allocating time (e.g., Jennings and Brush 2013, Guzman and Kacperczyk, 2019, Thébaud 2010, 2015); accordingly, female employees will likely enter at higher rates than male employees, when entry barriers decline.

Second, focusing on the unintended effects, we expect these departures to entrepreneurship to reduce the ability to create and capture value by workers most socially proximate to the departed females. Rent allocation among employees within a firm intricately depends on the workers' ability to create value – through their productivity – and to capture it – through their bargaining power (Blyler and Coff, 2003; Coff, 2010). Yet both are likely to decline among minority workers, such as women, because an increase in turnover among their peers will weaken their ability to form coalitions in order to influence key organizational outcomes (e.g., Burke and McKeen, 1996; Ely, 1995; Kanter, 1977). Hence, as female employees leave to entrepreneurship at disproportional rates, the value created and appropriated by the remaining female workers will fall, leading to a wider gender gap in pay at incumbent firms.

In sum, we predict that reducing entry barriers to venture formation through regulatory institutions will have two opposing effects, leading to the intended effects on workers who become founders and unintended effects on workers who stay behind. The intended effect will involve fostering entrepreneurship among individuals facing stronger entry barriers (i.e., women), and thus decreasing gender disparities at the point of entry. But the unintended effect will involve reducing the ability to create and capture value in incumbent firms by socially-proximate individuals, or other women, thus enhancing gender pay disparities within established firms.

To further explore these mechanisms, we examine the heterogeneous effects across different organizational levels. First, we expect the intended effect to be stronger for women at higher

organizational levels, such as management positions. Because returns to skills are likely lower for female than male managers, entrepreneurship will function as an alternative path to advance, while overcoming barriers placed on female advancement in wage work (e.g., Carnahan et al., 2012; Sørensen and Sharkey, 2014; Yang, Kacperczyk and Naldi, 2019). Second, we expect the gender disparities in pay within incumbent firms to be amplified in managerial positions because these jobs will become more male-dominated, as female managers disproportionately leave for entrepreneurship, undermining the productivity and bargaining power of their remaining peers in equivalent jobs.

The impact of regulations designed to reduce barriers to entry is difficult to address empirically because such institutional changes might be endogenous with respect to gender pay gaps within incumbent firms, as correlated with other economic, social or institutional factors affecting gender disparities. We address this empirical challenge by exploiting a quasi-natural experiment provided by the staggered enactment of an important entry deregulation reform (the “On the Spot Firm” program) implemented in Portugal from 2005 to 2009. The Portuguese reform reduced the barriers to startup entry by decreasing bureaucratic and financial burdens on those starting new ventures. Evidence suggests that the timing of the reform’s enactment across different municipalities is considered exogenous with respect to the socio-economic characteristics of the municipalities themselves (e.g., Branstetter et al. 2014, Fernandes et al. 2014). Given the exogenous timing of the reform and its staggered nature, it is possible to estimate the effects of these institutional changes using a difference-in-differences methodology—with the “treatment” group composed of municipalities that are subject to these reforms, and the “control” group composed of municipalities that are not. To estimate these effects, we leverage a set of large-scale, longitudinal, employee–employer matched data from Portugal containing the annual accounts of all limited liability firms in Portugal. The data document complete career histories and life events of the entire population of Portuguese employees, allowing us to characterize women’s entry into entrepreneurship as well as gender pay disparities in paid employment.

Overall, our study makes multiple contributions. First, we contribute to the research on strategic human capital, by shedding light on the micro-level mechanisms driving rent allocation within incumbent

firms (e.g., Blyler and Coff, 2003; Qian et al., 2017). In this respect, we document that minority workers, such as women, will create and capture relatively less value within the firm, following the unintended effects of reducing entry barriers to venture formation and the subsequent attrition of female peers. Second, we extend research on institutions and entrepreneurship (e.g., Eesley, 2016; Eberhart et al. 2017), by documenting not only the intended but also the unintended consequences of such regulations, and examining how such effects might vary with employee gender. Finally, our study contributes to the discussions in strategic human capital, focused on the critical role of human capital in creating and sustaining a firm's competitive advantage (e.g., Harris and Helfat, 1997; Mawdsley and Somaya, 2016; Starr, Ganco, and Campbell, 2018). Whereas past research has documented that startups threaten incumbents by decreasing retention of valuable talent and therefore a firm's know-how (Agarwal et al., 2004; Agarwal et al., 2015; Wezel et al., 2006), our research identifies yet another way in which startups' entry might pose a challenge to incumbents: by decreasing the productivity or influence of certain groups of workers.

THEORY

Past Research

Growing evidence suggests that the institutional environment, primarily stemming from regulations designed to lower barriers to entry into entrepreneurship, is a critical factor in facilitating entrepreneurial mobility and higher rates of new-venture foundings (e.g., Eesley, 2016; Kouriloff, 2000; Levie and Autio, 2010; Sine and David, 2003; Sine, Haveman, and Tolbert, 2005). For example, a frequent finding of the regional-level studies has been that entry rates as well as growth orientation of new ventures increase following the enactment of institutional regulations designed to facilitate new-venture formation, by easing access to capital and other resources needed to launch a startup (Kaplan, Piedra, and Seira, 2011). Conversely, when barriers to entry are stricter or better enforced, entry rates tend to fall (Prantl, 2012). Other studies have confirmed these patterns at the individual level, showing a robust empirical link between reforms designed to reduce entry thresholds and an individual's ability to become an entrepreneur, as well as the subsequent entrant's performance (e.g., Eberhart et al. 2017, Eesley 2016).

However, despite rich research inquiry into regulatory institutions, our understanding of their effects remains incomplete. Scholars have focused on employees who transition into entrepreneurship, an intended consequence of regulations lowering entry barriers to entrepreneurship. Yet much less attention has been devoted to those who stay behind— even though these employees may be subject to unforeseen outcomes (Merton, 1963), when resources to create a new venture become more abundant or more easily available. Those who stay put at established firms are charged with the core strategic task of creating and capturing value (Blyler and Coff, 2003; Qian et al., 2017), and such activities are of key importance to strategic management of human capital (Blyler and Coff, 2003; Carnahan, Agarwal, and Campbell, 2012; Coff, 2010; Qian et al., 2017). But the departure of certain employee groups to entrepreneurship may dramatically change how rents are being allocated internally. When some employees exit to become founders, this might undermine the productivity and bargaining power of certain “stayers,” reducing their ability to generate value and appropriate rents. Hence, the effects of such regulations on the allocation of pay across incumbent workers need to be considered more fully.

In what follows, we develop a theoretical rationale that combines both the intended consequences for those who transition into entrepreneurship and the unintended consequences for those who remain attached to incumbent firms, following institutional changes that lower entry barriers. Studies of entrepreneurship and institutions suggest that the impact of regulatory institutions might vary widely across individuals (e.g., Chatterji et al., 2012; Eberhart et al. 2017, Eesley 2016), and that only some individuals take advantage of lower entry barriers (e.g., Eberhart et al. 2017, Eesley 2016). For example, legal changes in bankruptcy protection only induce elites to start new ventures (Eberhart, Eesley and Eisenhardt, 2017), while the reduction in barriers to growth increases the likelihood of founding a new venture, but only among higher-human-capital individuals (Eesley, 2016). Building on these studies, we suggest that the intended impact of such changes will be stronger for employees who face systematic barriers at the point of entry, and thus are disadvantaged when attempting to become founders. As these disadvantaged workers depart to entrepreneurship at higher rates, this will, in turn, lead to unanticipated outcomes for the remaining workers who are socially proximate to the departed.

Ample evidence suggests that historical minorities, such as women, tend to face more systematic and more significant obstacles to entrepreneurship, having only limited access to resources (e.g., funding and time) required to launch a startup (e.g., Jennings and Brush 2013, Guzman and Kacperczyk 2018, Kim et al. 2006, Ruef et al. 2003, Thébaud 2010, 2015, Yang and Aldrich 2014). Hence, we expect that reducing barriers to entry will have a double-edged-sword effect on female workers. On one hand, such regulatory institutions will generate the intended effects, by facilitating a more equal access to resources and therefore disproportionately increasing the rates of female-founded ventures. On the other hand, such initiatives will have unintended consequences for women who stay in paid employment. They will likely suffer losses in productivity and bargaining power following their colleagues' departure to startups, and such unexpected effects will decrease women's appropriation of rents, widening the gender pay gap in established firms.

The “Intended” Impact of Reduction in Barriers to Entrepreneurship

A fundamental notion in entrepreneurship research is that entrepreneurial entry depends on an individual's ability to accumulate resources needed to start a new venture (e.g., Shane and Venkataraman 2000). This process is wrought with challenges, however, as prospective entrepreneurs, who once identified a promising opportunity, need to commit significant time and effort to convince others (including family members, friends, and professional investors) to fund a fledgling venture. And even when the initial obstacles are eventually overcome, many startups subsequently fail, given the challenges of operating, managing, and scaling a new venture.

These challenges associated with becoming an entrepreneur are particularly acute for women, who face systematic obstacles when identifying opportunities and accumulating resources required to launch and operate a startup (e.g., Hout and Rosen 2000, Keister and Moller 2000, Kim et al. 2006). Indeed, entrepreneurial outcomes show stark disparities across gender lines, including the act of starting and running a new venture (Kacperczyk and Guzman, 2019; Thébaud, 2010, 2015; Thébaud and Sharkey, 2016). For example, female-founded ventures appear severely underrepresented amongst new startups, and gender disparities are stronger among new firms with a high-growth orientation. Among companies

registered in California and Massachusetts, only twenty percent of all new startups are female-founded, and less than ten percent of all startups are both female-founded and have a patent (Guzman and Kacperczyk, 2019).

These substantial female disadvantages in entrepreneurship reflect, in part, a “resource-access problem” – or difficulties that women face in mobilizing the capital and time necessary to launch a new venture. When entering entrepreneurship, women are subject to discrimination by key resource providers, including investors (Blanchflower, Levine, and Zimmerman, 2003; Heilman and Chen, 2003; Thébaud, 2010, 2015), consumers (Coyne, Isaacs, and Schwartz, 2010; Younkin and Kuppuswamy, n.d., 2017), and employees (Kacperczyk et al., 2018). Investors, in particular, hold an “evaluative bias,” and their assessments of female entrepreneurs are infused with persistent stereotypes and deep cultural biases against historically disadvantaged individuals (Huang and Pearce, 2015; Kanze *et al.*, 2018). Accordingly, women are considered less qualified and less competent entrepreneurs (Bigelow *et al.*, 2014; Brooks *et al.*, 2014; Thébaud, 2015), and such inferences about their “fitness” with entrepreneurial domains tend to reduce investors’ willingness to fund female-founded ventures (Blanchflower *et al.*, 2003). For example, the odds of receiving credit from suppliers (Freeland and Keister, 2016), banks (Thébaud and Sharkey, 2016), or venture capitalists (Brush *et al.*, 2002; Canning, Haque, and Wang, 2012; Guzman and Kacperczyk, 2019) have been found to be significantly lower for women than for observationally equivalent men. And these disparities tend to persist even when differences in creditworthiness or other observables, including human capital, industry, and credit histories, are controlled for (Blanchflower *et al.*, 2003; Hout and Rosen, 2000), or in experimental conditions, wherein gender is randomly assigned (Thébaud, 2010). Finally, because of childcare demands that fall disproportionately on women, the time needed to start a new venture is a significant barrier to women, hindering again their entry into entrepreneurship (e.g., Budig 2006). Together, the previous studies provide consistent evidence that obstacles to mobilizing the resources on which a successful launching of a new venture and its subsequent survival depend are systematically higher for women than for men.

It follows that lowering the level of resources needed to start a new venture will increase the rates of entrepreneurial entry in general (Meek, Pacheco, and York, 2010), but the impact will likely be stronger among women, given the systematic obstacles they face when mobilizing the needed financial resources or finding time (Armanios et al., 2017; Eesley, 2016). Hence, following the regulatory shift that reduces barriers to venture formation, gender disparities in entrepreneurial rates will decline, with disproportionately higher rates of females choosing to pursue entrepreneurship relative to their male counterparts.

H1: Following a reduction in barriers to entry, gender disparities in entrepreneurship will decrease, as entrepreneurial foundings will increase at a higher rate for women than for men.

Our argument further suggests that the intended effect of regulatory changes will be heterogeneous across firm workers, varying not only with their gender but also with their hierarchical position within the organization. A decline in entry barriers will determine an *objective* reduction in the resources needed to found a startup, but becoming a founder also critically depends on an individual's *subjective* motivation and willingness to pursue an entrepreneurial career in the first place (e.g., Sørensen and Fasiotto, 2011). Indeed, a successful entry requires combining resources to pursue opportunities, on one hand, and an individual's motivation and willingness to become a founder, on the other hand (e.g., Amit, Muller, and Cockburn, 1995; Evans and Leighton, 1989; Shane and Venkataraman, 2000).

The motivation to pursue entrepreneurial opportunities might be higher for women occupying managerial positions, since gender disparities and discriminatory behaviors might be more salient at higher organizational ranks. First, stereotypes about gender—and the resulting discriminatory practices against female employees—tend to be stronger at the managerial levels, which are usually associated with masculine qualities (Eagly et al. 1992, Cotter et al. 2001). In addition, precisely because of those gender stereotypes, female workers might face stricter standards when being evaluated as candidates for managerial positions (Ridgeway and Correll 2006)—such that, those eventually appointed to managerial roles will be higher-quality compared to their male counterparts, despite receiving a similar or even lower compensation. Therefore, female managers might see entrepreneurship as a way to overcome

discriminatory practices and possibly achieve a more equitable compensation. Indeed, past studies have found that perceived disparities and discrimination at the workplace might be an important predictor of entrepreneurial entry (Conti, Kacperczyk, and Valentini, 2019), especially for women (Yang, Kacperczyk, and Naldi, 2019).

Overall, we therefore expect that, as entry barriers fall, making resources to form new ventures more easily available, they will disproportionately encourage women, who tend to lack access to such resources, to enter entrepreneurship. This relative increase in the rates of female entry will be amplified at managerial levels, where the negative effects of gender stereotypes on female workers might be especially salient.

H2: A decrease in gender disparities in entrepreneurship following a reduction in barriers to entry will be greater among employees in managerial positions.

The “Unintended” Impact of Reduction in Barriers to Entrepreneurship

Regulations that decrease entry barriers will generate the intended effects, by facilitating entrepreneurial entry among women, but they will also lead to unintended effects, by reducing the value creation and value capture by women who stay behind, subsequently decreasing their rent appropriation. Women’s wages will decrease relative to men’s because lowering entry barriers will disproportionately increase turnover among female workers at incumbent firms. This disproportionate entrepreneurial mobility will, in turn, lead to a shortfall in women’s relative wages, for two interrelated reasons.

First, higher entrepreneurial mobility among women in paid employment will lead to productivity losses among the remaining female workers. Disproportional female mobility into entrepreneurship will trigger change in relationships and organizational culture, fostering less female-friendly or female-oriented environment (Kanter, 1977). It has been well established, for example, that individuals, and especially minorities such as women, tend to rely heavily on demographically similar others (e.g., Ingram and Morris 2007, Verbrugge 1977), exhibiting a strong preference for homophilous groups in general, and within the work context in particular (Graves and Powell, 1996; Westphal and Zajac, 1995). Thus, following the disproportionately higher departure of female colleagues to entrepreneurship, the remaining

female employees will lose the support, mentorship, and help of some of their socially proximate peers. This may subsequently decrease the productivity of staying female employees, reducing their rent appropriation within an employer firm.

Second, the bargaining power of women as a group vis-à-vis their employer will also likely decline, as females' mobility into entrepreneurship increases. Several strands of research suggest that, as disadvantaged or minority groups (such as women or non-whites) become less represented in the firm, their influence over other organizational members or important organizational-level outcomes decreases dramatically, partly because forming coalitions with socially proximate peers becomes more challenging (Torchia, Calabrò, and Huse, 2011; Westphal and Milton, 2000; Ely, 1990). These theories suggest that, in some cases, female transition into entrepreneurship may lead the staying women to experience greater stigmatization, discrimination, and pressures to accept the outcomes imposed by more powerful groups, given that minorities tend to lose power when socially proximate peers are in shorter supply (Duguid, Loyd, and Tolbert, 2012; Hornsey and Hogg, 2000; Kanter, 1977).

This negative impact of female employee attrition will further be compounded at higher-echelon positions, where vacancies created by the departing female employees will most frequently be filled by male colleagues, given that the supply of qualified women might decrease within the firm and that women as a group will lose influence within the organization, when other women depart for entrepreneurship. As the firm's management becomes more male-dominated, women's ability to influence organizational outcomes will decrease, resulting in lower bargaining power among female workers. These losses will further undermine women's career advancement prospects and lead to even greater productivity shortfalls, since dissatisfaction with the work environment or perceived exclusion are both important predictors of employee productivity (e.g., Ely, 1990; Burke and McKeen, 1996).

Overall, we expect a reduction in entry barriers to lead to unintended effects for women at incumbent firms, whereby gender disparities in wages increase, following a disproportionate mobility of female workers. Because higher female attrition to entrepreneurship will undermine women's

productivity and influence, female employees will be less able than their male counterparts to appropriate rents generated within an established firm. Hence, we hypothesize as follows:

H3: Following a reduction in barriers to entry, gender disparities in pay at incumbent firms will increase, as women will earn lower wages relative to men.

Finally, this unintended impact of regulatory changes on gender pay gap will be heterogeneous, affecting employees differentially depending on their position. In particular, we expect gender differences in wages to be amplified for female managers because more significant losses in productivity and bargaining power will accrue to these workers. As we argued, following a reduction in entry barriers, the relative rate at which female employees in managerial roles leave, compared to their male counterparts, will be substantially higher than the equivalent relative rate for female workers occupying lower-level positions. Thus, any shift in demographic composition will be more acute in managerial positions, because these jobs are precisely the ones where gender diversity decreases most starkly. This will imply a significant loss for the remaining female managers in terms of help and support they would otherwise receive from socially proximate peers (Graves and Powell, 1996). In addition, the job satisfaction of female managers might dramatically decrease, as the organizational environment, especially at managerial levels, becomes more male-dominated (Ely, 1990; Burke and McKeen, 1996).

Second, and along similar lines, the disproportional female departure from managerial positions will undermine the bargaining power of the remaining female managers. As a firm's management becomes more male-dominated, women as a group will lose influence within the firm and thus be less able to build powerful coalitions (Torchia *et al.*, 2011; Westphal and Milton, 2000). Any new coalitions will be challenging to form because fewer women might be appointed to vacated managerial positions. And even if other female employees are eventually hired to replace the movers, valuable resources such as trust and support are often relationship-specific and difficult to replicate in a short term (Graves and Powell, 1996; ; Westphal and Zajac, 1995) – thus undermining the ability of the coalition to influence organizational outcomes.

Together, these arguments suggest that an increase in the gender gap in incumbent firms will be greater for female workers occupying managerial roles because, following the fall in entry barriers and the resulting transition of women into entrepreneurship, those roles will be particularly likely to become male-dominated. This implies greater productivity losses as well as greater reductions in bargaining power for the remaining female managers. Hence,

H4: An increase in gender disparities in pay following the reduction in barriers to entry will be greater among employees in managerial positions.

EMPIRICAL SETTING AND DATA

Empirically, it is difficult to estimate how reducing barriers to entry might lead to the unintended consequences for rent allocation among workers who stay in paid employment, because such estimates are subject to classical endogeneity problems. Regional-level characteristics might lead to a spurious correlation between barriers to founding a new venture in a given region, on one side, and the female–male gap in pay in the same region, on the other side. Therefore, to rule out any potential confounders, it is necessary to leverage a research design that provides exogenous shifts in entry barriers; such exogenous shifts would allow us to estimate the causal effect of lowering barriers to entry on gender disparities in entrepreneurship and wages in incumbent firms.

We identify exogenous changes in regulation by focusing on deregulation reform enacted in Portugal between 2005 and 2009. Beginning with 2005, the Portuguese government enacted an entry deregulation program – “On the Spot Firm” (Empresa na Hora) – which was enacted at different moments in time across different Portuguese regions (“concelhos,” or municipalities), determining a decrease in entry barriers in such regions. The objective of the program was to alleviate the bureaucratic burden when registering a new firm, which implied significant pecuniary and non-pecuniary (time) costs. Before 2005, starting a new business in Portugal took 54 to 78 days (see Figure 1) and any prospective entrepreneur needed to visit several offices and fill out more than 20 forms and documents, with an estimated cost of about 2000 euros (more than 13 per cent of the Portuguese annual GDP per capita). As a result, Portugal ranked relatively low (133 out of 155 countries) in the “Doing Business” ranking, conducted by the

World Bank (World Bank, 2006). To address these issues, the government enacted the “On the Spot Firm” program, an effort to consolidate different agencies across the country when supervising the creation of new ventures. As a result, entrepreneurs would no longer need to visit several public offices to obtain documents required for launching a startup. For example, the company’s identification card, corporate taxpayer number and social security number would now all be issued on the same day. Indeed, studies show that, following the “On the Spot Firm” program, Portugal became one of the most suitable environments for entrepreneurship, with an estimated time cost of less than one hour and financial cost of 300 euros— which, as is evident in Figure 1, is well below the OECD average (Branstetter et al., 2014; Fernandes et al., 2014).

Insert Figure 1 about here

The regulatory reform was officially launched in July 2005 and, in the same month, pilot one-stop shops were launched in the municipalities of Coimbra, Aveiro, Barreiro and Mota. The program expanded over time; by the end of 2009, there were 164 shops dispersed across 308 municipalities throughout the country. Notably, the staggered enactment of the reform across municipalities did not follow any specific criteria (e.g., number of inhabitants in a municipality or inhabitants’ GDP per capita). Therefore, following previous studies (Branstetter et al., 2014; Fernandes et al. 2015), the shock might be considered a quasi-natural experiment. In other words, the timing of enactment of the “On the Spot Firm” across municipalities might be seen as exogenous with respect to a municipality’s economic and social characteristics. Appendix Table A1 lists the opening year of the first one-stop shop for those municipalities that implemented the reform between 2005 and 2009. It is worth noting that whereas the registration of a new company can be performed in any of the one-stop shops located across Portugal – regardless of the location of the company’s headquarters – the fraction of firms registered outside their municipality is trivially small (Branstetter et al., 2014).

We test the intended and unintended effects of the deregulation reform by leveraging the registry data from Portugal, Quadro de Pessoal (QDP), maintained by the Portuguese Ministry of Labor and

Social Security. These matched employer–employee data track the population of Portuguese workers aged 16 years and above and their employers, allowing for longitudinal analyses of individuals’ transitions into entrepreneurship. Information on workers includes gender, age, education level (schooling), job, managerial position within the firm, qualification, type of contract of employment and earnings split into different components (essentially base wage and bonuses). Firm-level data include location, industry, and total number of workers. Unlike previous research (e.g., Fernandes et al., 2014), we consider firms in all industries – a complete list is reported in Table A2.

We restricted our analyses to the 2000–2009 period, mainly for practical reasons. First, to avoid any confounding effects from other environmental changes, we restrict our analysis within a short window around the exogenous shock, which began in 2005. Second, before 2000 some variables in our analyses (e.g., employee contract type) are incomplete. Finally, a new online procedure for the registration of new firms was implemented in 2009, whereby all municipalities – even those where the regulatory reform was already not enacted – benefitted from a simplified process to found a new company. This naturally nullifies any cross-region variation in exogenous entry after 2009.

VARIABLE DESCRIPTION

Dependent Variables

Entry into entrepreneurship. Because entrepreneurship, which refers to launching a new business with employees to “operate it from the owner-manager position” is conceptually distinct from self-employment, which refers to “initiating a sole proprietorship to sell one’s own service or products” (Carroll and Mosakowski 1987:575), we exclude from our measure the instances of self-employment and only consider new ventures with at least one employee in addition to the founder. For robustness, we use alternate measures based on new venture’s size and find similar results. Using the QDP database, which allows for tracking transitions of employees from paid employment into entrepreneurship, we thus measure entrepreneurial mobility as a dummy equal to “1” if (a) in a given year an individual is

associated with a firm different from their employer in the previous year, and (b) the individual becomes an employer at the focal firm (i.e., hires at least one other individual).¹

Wage. The monthly wage of the worker is constructed by adding up the following wage components: (a) base pay, or the gross amount of money paid in a given month to employees on a monthly basis for their normal hours of work; (b) regular payments (e.g., tenure-related payments); and (c) payment for extra work hours.

Moderating and Control Variables

Female. Our main moderating variable is a dummy variable equal to “1” for female employees, and “0” for male employees. Interacting this variable with the entry deregulation reform allows us to estimate the differential effect of the treatment for the female versus male employees.

Managerial position. We consider a firm’s hierarchy to indicate whether an employee occupies a managerial position in the current firm. The Portuguese registry contains detailed information on organizational rank, with records that account for eight hierarchical levels, based on the amount of autonomy individuals have in their jobs. These levels include (in descending order): top managers, middle managers, supervisors and team leaders, higher-skilled professionals, skilled professionals, semi-skilled professionals, non-skilled professionals, apprentices, interns and trainees. An employee occupies a managerial position within an incumbent organization if she/he is a top or a middle manager.² To mitigate concerns that endogeneity might arise if the entry deregulation reform affects the position of the employees within a firm, we measure the position of individual employees in 2004, the year before the reform was approved.

Controls. Our regressions include additional characteristics of the worker—or the founder, when the worker leaves the company—and the firm as a covariate. In particular, for the worker, we account for

¹ We exclude hybrid entrepreneurs, that is, those individuals creating a new venture while keeping their positions as paid employees. However, results (available upon request) remain robust to including such individuals in our sample.

² As a robustness check, we define the managerial position dummy equal to one when an employee occupies top managerial positions. Results (available upon request) remain quantitatively and qualitatively similar.

the hierarchical level she/he occupies—defined as a “high qualification” level for top managers, middle managers, supervisors and team leaders, higher-skilled professionals; a “medium qualification” level for skilled professionals; and a “low qualification” level for semi-skilled professionals, non-skilled professionals, apprentices, interns and trainees. We also account for age and its square, level of education³, occupation⁴, type of paid-employment contract (either short-term or indefinite)—which is not defined when the employee becomes a founder—and overall monthly hours worked. In some specifications, we also include an individual-fixed effect to control for individual time-invariant characteristics, and a fixed effect per employee–employer match, to control for time-invariant factors related to the same individual as long as they stay in the same company.

At the firm level, we control for size (number of firm employees). We also include firm-fixed effects, which control for firm time-invariant characteristics, including the industry where the company operates and its ownership status (private, public or foreign-owned). Finally, we add region (municipality) and year dummies to control for unobserved region characteristics and aggregate shocks.

Descriptive statistics and pair-wise correlations are presented in Tables 1 and 2. Notably, about 42 percent of the employees are female. Furthermore, the average female wage is substantially lower than the average male wage – even if this difference does not take into account other factors, such as level of education or occupation. Hence, despite female employment increasing steadily in Portugal over the last years, there is evidence of gender disparities in the labor market (Vieira, Cardoso, and Portela, 2005). Finally, the sample of employees affected by the “On the Spot Firm” reform is substantial and equal to 32 percent of the overall employee population, which increases the external validity of our estimates.

³ We consider individual level of education (years of schooling), as defined by the International Standard Classification of Education (ISCED). In particular, we define a dummy variable “High education” equal to 1 for individuals with an ISCED 4/5/6 level – higher education (which corresponds to university degree), i.e., more than 12 years of schooling. The dummy variable “Low education” and “Medium education” are respectively equal to 1 for individuals with ISCED level 1 (i.e., less than 9 years of schooling) and for individuals with ISCED level 2 (i.e., between 9 and 12 years of schooling).

⁴ Occupations are recorded in the QDP data at the six-digit level in accordance with the International Standard Classification of Occupations (ISCO) for 1988. We use ISCO-88s major groups: 1 – directors; 2 – intellectual and scientific specialists; 3 – professional and technical; 4 – administrative and managerial; 5 – clerical and sales workers; 6 – agriculture, silviculture and fishing; 7 – production and related workers; 8 – equipment operators and laborer’s; and 9 – unqualified workers.

Insert Table 1 & Table 2 about here

METHODOLOGY

To examine the impact of the “On the Spot Firm” reform on entry and wage, we use a difference-in-difference estimator based on the treatments listed in Table A1. As the implementation of the “On the Spot Firm” reform is staggered over time across municipalities, the composition of both the treatment and the control groups changes over time, as more states become progressively “treated.” Hence, our methodology follows the application by Bertrand and Mullainathan (2003) of the difference-in-differences methodology in the presence of staggered treatments at the regional (in our case municipality) level. Furthermore, we are specifically interested in estimating the heterogeneity of the treatment effect for different groups of the treated population. Hence, following other studies analyzing the heterogeneous effect of a treatment in a diff-in-diff framework (e.g., Chatterji et al. 2012, Chava et al. 2013, Branstetter et al., 2014, Fernandes et al. 2014), our main specifications will take the following form:

$$Y_{imt} = f(\beta \text{Entry_deregulation}_{mt} + \gamma \text{Entry_deregulation}_{mt} \times \text{Female}_i + \beta_{CV} CV_t) \quad (1)$$

where Y is our dependent variable (transition into entrepreneurship and wage), “Entry_deregulation” is a dummy variable equals to “1” if individual i is working in a municipality m that has enacted the entry deregulation “On the Spot Firm” program by year t , and “Female” is a dummy equal to “1” for female employees (and “0” for male employees). CV is a vector of control variables, including, as mentioned, municipality, firm, individual, and year-fixed effects. Including individual fixed effects in certain models implies that our analyses are estimated on the same employees before and after treatment, net of any change in the composition in the labor force. Errors are always clustered at the municipality level, to address potential serial correlation concerns, as highlighted by Bertrand et al. (2004). The coefficient of interest is γ , which measures the differential effect of the “On the Spot Firm” reform for female versus male employees. For instance, H1 predicts that γ should be positive and significant when Y is transition into entrepreneurship, suggesting that the regulatory reform increases the odds of entrepreneurial entry more for female than for male workers. At the same time, H3 predicts that γ should be negative and

significant when Y is wage, suggesting that reform increases the gender pay gap.

To test H2 and H4 – the differential effect of the shock according to both the gender and the managerial position of the employees – we re-estimate (1) by adding a triple interaction between the treatment, the gender variable and “Managerial_position.” The latter is a variable equal to “1” for employees working in a managerial position in 2004 (the year before the deregulation was approved, to avoid any endogeneity issue), and “0” otherwise. This specification takes the following form:

$$Y_{imt} = f(\beta \text{Entry_deregulation}_{mt} + \gamma \text{Entry_deregulation}_{mt} \times \text{Female}_i \times \text{Managerial_position}_i + \beta_{cv} CV_t) \quad (2)$$

We control for “Managerial_position” as a standalone variable, and any possible double interactions between “Entry_deregulation”, “Female” and “Managerial_position.” Furthermore, we include all the controls already mentioned in (1). Consistent with H2, we expect γ to be positive and significant when the dependent variable is entry; instead, consistent with H4, γ should be negative and significant when the dependent variable is the employee wage.

RESULTS

Main Results

We begin by verifying that, as intended, the “On the Spot Firm” reform led to a substantial increase in the number of new entrants. We first plot the differential number of entrants by “treated” and “control” municipalities. Figure 2 provides suggestive evidence that, before the enactment of the reform (represented as time “0”), the treated and control municipalities displayed similar entry patterns – which confirms that this institutional change might be considered an exogenous treatment. However, following the reform, treated municipalities experience an increase in the number of new firms compared with municipalities in the control group. Such an increase occurs immediately after the change and tends to increase over time. The positive effect of the entry deregulation on entry is also evident when estimating the municipality-level regressions. Table A3 shows that the “On the Spot Firm” reform exerts a strong positive effect on the number of new firms created in a certain municipality and year (column 1) – which increases by about 18 units – and the log of this number (column 2) – suggesting that an increase is equal

to around 7 percent in relative terms. These findings are recovered even when we consider the municipality-industry level of analysis, as we do in columns 3 and 4 by introducing a municipality, year and industry-fixed effect. Overall, consistent with our previous findings, we find that the “On the Spot Firm” reform increased the number of new entrants by about 7 percent, which suggests that our treatment is relevant. In short, the treatment led to a substantial decrease of entry barriers, usually faced by potential entrepreneurs.

Insert Figure 2 about here

We next plot gender disparity in entrepreneurship and in paid employment, following the treatment. To obtain a broad assessment of the effect of the entry deregulation reform, we begin by plotting simple graphs. Figures 3 and 4 show the differential effect of the entry deregulation reform on the gender differences in entrepreneurship rates (Figure 3) and wages in paid employment (Figure 4) at the aggregate municipality level (including year and municipality fixed effects and clustering errors at the county level).⁵ As can be seen, consistent with our theory, the “On the Spot Firm” reform led to the intended effect, by disproportionately enhancing transition into entrepreneurship among individuals facing more significant entry barriers, such as women. At the same time, the treatment led to the unintended consequences, given the increase in gender-pay differential in paid employment, with women earning even less relative to men, following the enactment of the reform.

Insert Figure 3 & Figure 4 about here

We next evaluate the intended and unintended effects at the individual level, controlling for individual characteristics. Specifications in Table 3 (columns 1 and 2) estimate the effect of the regulatory reform on the intended effect of becoming an entrepreneur. Column 1 estimates this relationship with fixed effects for occupation, year, and municipality. As can be seen, there is a gender gap in transition

⁵ To ensure that our results are not driven by composition in the labor force, in counties enacting the “On the Spot Firm” reform, we included only those employees present in the sample both before and after the program’s enactment.

into entrepreneurship, with female workers being 0.08 percentage points less likely than male workers to start their own firm. Column 2 includes individual-fixed effects to control for any change in the composition of the labor force; here, we focus exclusively on employees present in our data before and after the treatment. As expected, the entry reform increases the likelihood of transitioning into entrepreneurship more for women than for men ($\beta=0.0017$, $p<0.001$). In relative terms, this represents a 40 percent increase in the probability of becoming an entrepreneur – considering that the baseline probability of a female employee becoming an entrepreneur is equal to 0.004 (as reported in Table 1). Overall, our results lend support to H1, suggesting that the reform leads to the intended effect, whereby individuals facing more systematic entry barriers (i.e., women) enter entrepreneurship at a higher rate.

Hypothesis 2 states that this intended effect of the entry deregulation reform will be amplified for female employees occupying managerial positions in the organizational hierarchy, due to their greater motivation and willingness to pursue an entrepreneurial career in the first place. Table 3 (columns 3 and 4) provides support for this hypothesis. As can be seen, managers are less likely to leave the firm, following the entry deregulation reform (column 3). This might be because individuals in managerial positions are, in general, less constrained by entry barriers, given that they have more ample financial resources for starting their own business at their disposal. Also, individuals in managerial positions, regardless their gender, are possibly more satisfied with their job and have weaker incentives to sever ties with the current employer. However, as predicted, we find support for the differential effect of the entry reform on female vs. male managers: consistent with H2, column 4 suggests that, following the entry deregulation reform, female employees in managerial positions have a significantly higher likelihood of becoming entrepreneurs than their male counterparts. Specifically, the probability of female employees in non-managerial positions of becoming entrepreneurs increases by 0.0006 compared with their male counterparts ($p<0.05$); however, when we consider female employees in managerial jobs, the same likelihood increases by a further 0.0037 ($p<0.001$). This is a significant increase with respect to the baseline probability of an average female employee to become an entrepreneur.

Insert Table 3 about here

Whereas deregulation reforms lead to the intended effects by reducing gender disparities at the point of entrepreneurship entry, Hypothesis 3 suggests the unintended effects among those who stay in paid employment, considering specifically gender differential in pay. Table 4 reports the results of an individual-level regression model, with logged wage being the dependent variable. Column 1 includes occupation, year, and municipality-fixed effects. As can be seen, even after controlling for observable differences in human capital and demographics, stark disparities in pay appear to exist between female and male workers, with women earning around 22 percent less than men. Column 2 re-estimates this baseline specification but adds an individual-fixed effect to account for any potential changes in the labor market, following the treatment. This specification therefore estimates our results only for workers present in the data before and after the treatment. Consistent with H3, the entry deregulation reform has increased gender disparity in pay by 1 percentage point ($p < 0.001$).⁶ In relative terms, given that the baseline gender pay gap is about 20 percentage points, this corresponds to a 5 percent increase in this differential. Our results are further recovered in column 3, where we include firm-fixed effects to eliminate the possibility that changes in employer composition before and after the shock might drive our results. In Column 4, we re-estimate the baseline specification with the employee–employer match-fixed effects to mitigate the possibility that our results reflect a re-allocation of the employees into different firms, following the treatment. Our results remain unchanged in these two specifications, reinforcing our confidence that the unintended effect of the deregulation reform, the gender gap in pay for the same workers in the same firm, is likely to increase, following the treatment.

Hypothesis 4 suggests that the unintended effect of lowering entry barriers on female wages should be particularly relevant for women in managerial positions, when compared to men in the same positions. Table 5 confirms our expectation. In particular, results presented in column 2 – controlling for

⁶ We also performed additional analyses to assess the time it takes for the entry reform to produce the effect on rents, by considering different time-windows around the shock. Results (available upon request) show that the effect becomes stronger around year 3 and continues increasing in strength till year 5. These results support, therefore, the notion that the mechanisms driving our results are more likely to materialize over a longer run.

change in the composition of the labor force via individual-fixed effects – show that female employees in managerial jobs experience a salary decrease of 1.27 percent, compared with their male counterparts. Instead, the decrease in salary for females in non-managerial positions relative to male employees in similar positions, is only 0.82 percent. These findings are robust across specifications 3 and 4.

Insert Table 4 & Table 5 about here

Testing the Mechanisms

In additional analyses, we provide further empirical evidence for the mechanisms underlying our findings. First, we have argued that the entry deregulation reform, by promoting the departure of female employees, decreases the bargaining power of women as a historical minority group. This might have detrimental effects on female promotion chances to managerial positions, following the reform. Findings shown in Table 6 confirm this prediction. In general, women are less likely to be promoted to managerial positions (column 1), and this gender gap in promotion chances is amplified following the treatment (columns 2-4), suggesting that chances for promotion further decline following the entry deregulation reform. These findings lend further support to our expectation that declines in bargaining power or productivity, as manifested by lower promotion rates among female workers, underlie the unintended effects of de-regulation reform.⁷

Insert Table 6 about here

In additional analyses, we further verify the possibility that the departure of female colleagues leads to a productivity decline among the remaining female workers, by examining the influence of our treatment on pay for performance, or part of pay which is meant to incentivize productivity, and often includes stock options (e.g., Hartzell and Starks, 2003).⁸ When considering the effect on this incentive

⁷ Any internal sorting across positions, whereby women would occupy lower-ranked and therefore lower-paid jobs within firms following the treatment, is unlikely to account for our main findings. Because our results are estimated “within jobs,” as we include occupation-fixed effects in our models, any differences between jobs that women and men occupy do not account for the observed increase in the wage gap, following the treatment.

⁸ Our analyses exclude this wage component, consistent with common approach taken by prior wage studies (e.g., Fernandes et al. 2013). Scholars have argued that the “irregular” component varies severely from month to month – and the survey is taken in a specific and not-random month (October). In this sense, the pay-for-performance component may be a less reliable indicator of a worker wage compared to other components which do not vary

pay, the coefficient on the interaction term between the entry deregulation and the female dummy continues being negative and statistically significant across all model specifications (Appendix Table A4). This suggests that pay for performance decreased among female workers, following treatment. We interpret this finding as direct evidence that female productivity most likely decreased, following the treatment, thus leading to drops in variable, performance-based compensation.

As a further test of our mechanisms, we consider how the effect of the entry deregulation reform on the gender wage gap varies by industries and firm attributes. First, we argued that an increase in the probability of transition of female employees to entrepreneurship is detrimental to female employees who remain attached to paid employment, for both representation and productivity reasons. If so, then our effect will no longer hold for firms in which wage is less likely to reflect minority representation and where employee productivity is not (or at least is less of) a concern for managers. To falsify our results, we focus on state-owned enterprises. In state-owned firms, wage is usually influenced by the government, and there is limited room for managerial discretion regarding wage setting. Similarly, state firms are economically supported by the state, such that market profitability is less of a concern. We measure firm state ownership in 2004, the year before the reform was approved. Consistent with our predictions, we indeed find that the entry deregulation reform has a negative effect only on the wages of female employees who work in privately owned firms (Appendix Table A5, columns 1–4).

Second, we examine whether the effect varies with the industry-level gender pay gap – as measured by the difference between the median male and female salary in 2004, the year before the reform was approved. In industries with a higher gender pay gap, women might face the challenge of lower representation or lower productivity; hence, we expect the negative effect on female wage due to the entry deregulation reform to be particularly salient in this context. Appendix Table A6 shows that the

monthly or that vary depending on some variables which we can control for (e.g., extra hours worked). However, our results are recovered – and become stronger – when we include this component in the overall salary (results available upon request).

effect of the “On the Spot Firm” reform is amplified in industries where the (ex-ante) pay gap between men and women is wider. Specifically, the effect of entry deregulation widens the gender pay gap, especially in industries where women have a lower standing to begin with.

To the extent that women are more sensitive to our treatment, our results should further be amplified in female-typed industries or industries where women are more highly represented. To assess this claim, we compute the proportion of female employees within a given industry in 2004 (i.e., the year before the deregulation was approved to avoid any endogeneity issue) to measure whether an industry is more female-typed. As expected, we find that, after the entry deregulation reform, women are more likely to found a firm when working in traditionally female-typed industries, in which female workers are more highly represented (Appendix Table A7) and that, precisely in these industries, the negative effect of the entry deregulation reform on the wage of female employees is also stronger – consistent with the main mechanism being the departure of female colleagues (Appendix Table A8).

Finally, our theory pertains to entrepreneurship rather than to self-employment, as we consider ventures with at least one employee (e.g., Levine and Rubinstein, 2013). However, as robustness check, we rerun our analyses on entrepreneurship including only startups with at least five employees (Appendix Table A9). The results are quantitatively and qualitatively similar to our main findings.

Alternative Explanations

Our entry deregulation shock might affect the female–male wage gap through other mechanisms. A number of alternative explanations for our findings have already been ruled out by our controls and additional empirical tests. For example, to the extent that the deregulation reform might have induced exit among high-human-capital women, we rule out this explanation by including individual fixed effects as well as employee–employer pair fixed effects. In what follows below, we consider the remaining alternative explanations.

Mobility Threat. Our argument suggests that an increase in gender pay gap results from disproportionate mobility among female workers into entrepreneurship, following the enactment of the deregulation reform. However, another possibility might be that our findings simply reflect a firm’s

response to an increase in the *potential* threat of female workers' mobility determined by this institutional change. Indeed, firms tend to strategically counteract the risk of workers' mobility (e.g., Conti 2014; Castellaneta et al., 2016): in particular, following the regulatory reform, firms might invest less in the training of female employees – who are more likely to leave to entrepreneurship. This would naturally decrease the salary of female employees, compared with their male counterparts. If this explanation is valid, the entry deregulation reform (by determining a general increase in the potential female-employee risk of mobility) should lead to a decrease in the salary of female employees in all firms – even those not experiencing any exit of female employees. To assess this possibility, in Appendix Table A10, we re-estimate the baseline specifications while interacting the entry deregulation reform with a dummy variable equal to “1” for firms with no female workers leaving the firm *following* the deregulation reform. As can be seen, the negative effect is present only in the subsample of firms that experienced female employee attrition, once the deregulation law has been enacted. Conversely, amongst companies that experienced no female employee attrition, the effect is either not statistically significant or slightly positive – possibly because the mobility threat increases the bargaining power of female employees.

Work-life balance. Another concern is that our results of entry might be driven by different preferences of female vs. male employees regarding work-life balance. Women might attend to family responsibilities more than men, and thus be more likely to transition into entrepreneurship after the reform, aspiring to achieve greater work-life balance (e.g., Thebaud, 2015). From the theoretical standpoint, work-life concerns are most frequently a trigger of self-employment because lower work-life conflict is typically associated with being self-employed rather than running a formal, commitment-demanding venture (Yang, Kacperczyk, and Naldi, 2019). However, in our data, transition into self-employment is censored and therefore our results are less likely to reflect work-life balance differences between women and men. Nevertheless, we conduct additional analyses to investigate this possibility empirically. In our supplemental analyses (seen in Appendix Table A11), we split the sample into women older and younger than 45, considered to be the fertility age. As can be seen, these analyses reveal that the results still hold for women older than 45, or those above their fertility age – suggesting that our estimates

are not driven by women who are younger. Hence, both younger and older women are equally sensitive to the treatment effect.

Endogeneity of the shock. Our identification strategy assumes that the enactment of the entry deregulation law is exogenous with respect to entrepreneurial activity and wage level in the municipality. However, despite our diff-in-diff approach, one might still argue that the timing of the enactment of the entry deregulation reform is endogenous with respect to some variables (e.g., local social conservatism). Although previous studies consider the timing of the enactment to be uncorrelated with the economic and social characteristics of the municipalities (e.g., Branstetter et al. 2014), we nevertheless examine whether this is the case, by estimating a linear probability model to predict the timing of the law enactment. The dependent variable is equal to “1” in the year of the enactment in a given municipality, and “0” otherwise. For any municipality-year observation, we compute the following independent variables at year $t-1$: municipality entry rate (i.e., the ratio between new firms and total firms); the difference in entry rate between male and female employees; the difference between the median male and female wage; the employees average income; the overall population; the fraction of population out of the labor force. As shown in Appendix Table A12, all these variables are uncorrelated with the likelihood of enacting the “On the Spot Firm” reform in the municipality, suggesting that such enactment represents a valid quasi-natural experiment. More importantly, both the gender gap in entry rate and in wage within incumbent firms appear not to be associated with the reform enactment, reinforcing the validity of our identification.

Discussion

Institutional changes that reduce barriers to entry have a significant impact on the founding rates as well as the quality of new ventures founded (Eberhart *et al.*, 2017; Eesley, 2016; Thébaud, 2015). Ample scholarship has examined the intended consequences thereof, focusing on individuals who eventually become entrepreneurs and therefore are the target of such regulatory reforms. But little research has paid attention to the unintended consequences, or the impact of these institutional changes on employees who stay within incumbent firms and are not the original target of the regulatory institutions. In this study, we devote greater attention to the latter, by examining how regulatory barriers can indirectly affect the

process of rent allocation across different workers. In particular, we propose that such effects vary by gender because women face more acute obstacles in entrepreneurship (Ruef *et al.*, 2003; Yang and Aldrich, 2014), and are therefore more sensitive as a group to regulations that lower entry barriers.

Our study offers evidence for the claim that institutional changes generate two different effects, one intended and one unintended. On one hand, by lowering barriers to entry, institutional changes lead to intended effects, by disproportionately increasing the rates of entrepreneurship among most disadvantaged groups, such as women. Given that women face systematic obstacles when attempting entry (e.g., Thebaud, 2010; Guzman and Kacperczyk, 2019), lowering the threshold to found a new venture provides them with stronger incentives and better means to enter entrepreneurship. On the other hand, such reforms lead to unintended effects, by triggering a disproportionate attrition of female workers in paid employment, and ultimately reducing the ability of incumbent female workers to capture value, if they stay within incumbent firms. Finally, we expect the two effects – one that intendedly increases female rates of entry into entrepreneurship and one that unintendedly reduces female value creation and capture in incumbent firms – to be amplified among women in managerial positions, because female workers in these jobs are more willing and more motivated to take advantage of institutions lowering entry barriers.

Using rich employee–employer matched data from Portugal between 2000 and 2009, we find strong support for our predictions. Importantly, in this setting, we leverage a staggered reform which decreased barriers to entry by making the process of founding a new venture less costly and more accessible for aspiring entrepreneurs. Leveraging this exogenous reform as a quasi-natural experiment, we find that, relative to males – who offer a baseline for our analysis – women were more likely to transition into entrepreneurship, following the introduction of institutional changes. At the same time, and consistent with our expectations, women who stayed in paid employment witnessed a sharp decrease in pay relative to men. Finally, our effects are amplified among women in managerial jobs, because (a) these women are more likely to take advantage of the regulatory reforms that facilitate entrepreneurship, and (b) attrition of female peers is most detrimental to women who occupy such managerial positions.

Overall, then, we find strong support for the novel, so-far overlooked effect of regulatory changes on entrepreneurship, whereby these institutional shifts generate the anticipated conditions for women at the pivotal stage of entry into entrepreneurship, while also leading to some unanticipated consequences, which reduce the value creation and capture of female workers within incumbent firms.

Our research offers a number of contributions to strategic human capital theories and strategy studies of human capital. First, the present study extends the existing research, by identifying a novel channel – entry deregulation reform – to explain variation in rent appropriation within established organizations. Past research has documented that rivals, including new, fledgling ventures, pose to incumbents a significant threat of losing valuable workers (Agarwal, Ganco, and Ziedonis, 2009; Almeida and Kogut, 1999; Campbell and Ganco, 2012; Rosenkopf and Almeida, 2003) – who often hold valuable know-how and are therefore central for firm’s competitive advantage (Coff, 1997; Ganco, Ziedonis, and Agarwal, 2015; Kacperczyk, 2012). We complement this vibrant line of work by documenting that intra-firm rent appropriation can also be determined by regulatory institutions which lower entry barriers and that this effect varies profoundly by gender. In this respect, our study is the first to theorize and document empirically that some demographic groups – i.e., females – might simultaneously benefit and suffer from institutional reforms that promote entry.

Second, our study contributes to recent debates about the critical importance of retaining highly valuable workers, often central to creating and sustaining a firm’s competitive advantage (e.g., Coff, 1997; Flammer and Kacperczyk, 2016; Ganco, Ziedonis, and Agarwal, 2015; Harris and Helfat, 1997; Mawdsley and Somaya, 2016; Starr *et al.*, 2018). Multiple studies in this vein have documented that startups threaten incumbents by decreasing retention of valuable talent and therefore a firm’s know-how (Agarwal et al., 2004; Agarwal et al., 2015), if workers decide to “walk out the door,” taking with them the most valuable knowledge assets to startup firms (Wezel, Phillips, 2004; Campbell et al., 2011; Agarwal et al., 2016). We complement this line of research by documenting that institutional regulations that facilitate entry have yet another effect on some groups of workers within incumbents: women, who tend to suffer losses in productivity and bargaining power, appropriating less value, as a result.

We further offer direct contributions to the long line of inquiry on gender disparities in pay. A central insight in this research is that there exists a significant gap in the distribution of resources across women and men (e.g., Briscoe and Kellogg 2011, Castilla 2011, Cohen and Huffman 2007,), and that such differences cannot be entirely attributed to observable differences in skill or productivity or to differential sorting of women into lower-paying positions, occupations, or industries alone (Fernandez and Mors, 2008; Petersen and Saporta, 2004). Instead, scholars have suggested that organizational decision-makers might exhibit persistent stereotypes and cultural beliefs that play a crucial role in placing minorities at systematic disadvantage in labor markets (e.g., Castilla 2011, Cohen and Huffman 2007,). We contribute to this literature by highlighting conditions – startup entry by female employees – under which such persistent stereotypes might even be reinforced and result in even greater gender differences in pay.

Finally, our findings have important implications for future research. Although the results we present in this paper are suggestive of a decrease in bargaining power or reductions in productivity that women experience, following the deregulation reform, future research should investigate those processes in greater depth, providing more direct evidence for each. This might require more fine-grained-level data sourced from a company or qualitative interviews with women and men affected by the reforms. Such findings, in combination with our results, are likely to have important policy implications. The main implication of our study is that policy interventions that promote entrepreneurship should pay greater attention to the potential downsides, especially those which represent the unforeseen consequences of such policies. In this respect, our study shows that lowering barriers to entry increases female representation among founders, while simultaneously harming women who stay in paid employment and witness reductions in their productivity and bargaining power, following the departure of their female colleagues into entrepreneurship. Hence, policy makers should pay greater attention to the notion that regulations increasing entry rates might be a double-edged sword when it comes to gender inequality. Policy responses might further differ depending on whether reduction in bargaining power or productivity is the main driver behind the widening gender gap. For example, if reduction in bargaining power are the

main driver, then wage equality laws may be needed. Conversely, if decreases in productivity are the main culprit, then educational or firm level responses may need to be developed to rectify the problem.

More broadly, our findings suggest that such interventions might paradoxically enhance discriminatory behaviors toward women who stay in wage employment. Assessing whether the upsides – in terms of promoting female-founded ventures – outweigh their costs – in terms of leading to relatively lower salary and less attractive work conditions – is a relevant research avenue we leave for future research.

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TABLES

Table 1. Descriptive statistics

	Count	Mean	SD	Min	Max
Entry deregulation	21581689	0.324	0.468	0	1
Wage*	19384856	845.029	833.166	0.010	208333.328
Female wage	9130353	652.799	585.839	0	50000.000
Male wage	12451336	836.896	963.259	0	208333.328
Entrepreneur	21581689	0.006	0.077	0	1
Female entrepreneur	9130353	0.004	0.064	0	1
Male entrepreneur	12451336	0.007	0.085	0	1
Female	21581689	0.423	0.494	0	1
Managerial position	21581689	0.163	0.369	0	1
Age	21581689	38.150	11.367	14	79
High education	21581689	0.113	0.317	0	1
Mid education	21581689	0.400	0.490	0	1
Low education	21581689	0.487	0.500	0	1
High qualification	21581689	0.269	0.444	0	1
Medium qualification	21581689	0.405	0.491	0	1
Low qualification	21581689	0.326	0.469	0	1
Hours worked	21581689	146.435	56.587	1	524
Long term contract	19977543	0.729	0.444	0	1
Workers (ln)	21581689	720.041	2340.695	1	20097

*wage is defined only for paid employees

Table 2. Correlations

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Entry deregulation	1.00								
2. Wage	0.10	1.00							
3. Entrepreneur	-0.01	0.00	1.00						
4. Female	0.03	-0.14	-0.02	1.00					
5. Managerial position	0.04	0.45	0.16	-0.06	1.00				
6. Age	0.03	0.14	0.00	-0.08	0.13	1.00			
7. High education	0.10	0.39	0.01	0.07	0.45	-0.08	1.00		
8. Mid education	0.08	0.01	0.01	0.04	-0.07	-0.26	-0.29	1.00	
9. Low education	-0.14	-0.26	-0.02	-0.08	-0.21	0.31	-0.35	-0.80	1.00
10. High qualification	0.06	0.47	0.12	-0.08	0.73	0.14	0.44	-0.00	-0.28
11. Medium qualification	-0.04	-0.13	-0.05	-0.10	-0.36	-0.03	-0.19	0.03	0.09
12. Low qualification	-0.01	-0.27	-0.05	0.18	-0.31	-0.11	-0.22	-0.03	0.17
13. Hours worked (ln)	0.02	0.14	-0.20	-0.01	-0.43	-0.12	-0.04	0.03	-0.01
14. Workers (ln)	0.06	0.13	-0.02	0.04	-0.03	-0.02	0.03	0.11	-0.12

	10.	11.	12.	13.	14.
10. High qualification	1.00				
11. Medium qualification	-0.50	1.00			
12. Low qualification	-0.42	-0.57	1.00		
13. Hours worked (ln)	-0.30	0.18	0.09	1.00	
14. Workers (ln)	0.02	-0.03	0.01	0.05	1.00

Table 3. Effect of the reform on transition into entrepreneurship

	1	2	3	4
Entry deregulation	0.0002 (0.0003)	-0.0003 (0.0003)	0.0018 (0.0002)	0.0024 (0.0003)
Female	-0.0008 (0.0001)		-0.0014 (0.0001)	
Entry deregulation*Female	0.0009 (0.0001)	0.0017 (0.0002)	0.0000 (0.0001)	0.0006 (0.0002)
Managerial position			-0.0203 (0.0026)	
Entry deregulation*Managerial position			-0.0126 (0.0025)	-0.0178 (0.0024)
Female*Managerial position			0.0042 (0.0005)	
Entry deregulation*Female*Managerial position			0.0031 (0.0007)	0.0037 (0.0006)
Age	0.0008 (0.0000)	0.0006 (0.0001)	0.0009 (0.0000)	0.0003 (0.0001)
Age squared	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
Mid education	0.0012 (0.0001)	0.0024 (0.0001)	0.0016 (0.0001)	0.0023 (0.0002)
High education	-0.0019 (0.0003)	0.0012 (0.0004)	0.0004 (0.0005)	0.0015 (0.0004)
Hours worked (ln)	-0.0067 (0.0002)	-0.0095 (0.0003)	-0.0068 (0.0002)	-0.0094 (0.0003)
Mid qualification	0.0004 (0.0001)	0.0016 (0.0002)	0.0002 (0.0001)	0.0015 (0.0002)
High qualification	0.0028 (0.0001)	0.0121 (0.0009)	0.0052 (0.0004)	0.0118 (0.0009)
Workers (ln)	-0.0011 (0.0000)	-0.0044 (0.0001)	-0.0011 (0.0000)	-0.0044 (0.0001)
Constant			0.0625 (0.0025)	0.1355 (0.0048)
R2	0.06	0.27	0.06	0.27
N	21,581,689	20,475,411	21,581,689	20,475,411
Occupation	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES		YES

Robust standard errors clustered by municipality in brackets

Table 4. Effect of the reform on wage by gender

	1	2	3	4
Entry deregulation	-0.009 (0.004)	0.008 (0.003)	0.007 (0.003)	0.006 (0.003)
Female	-0.197 (0.006)			
Entry deregulation*Female	0.006 (0.004)	-0.010 (0.002)	-0.006 (0.001)	-0.004 (0.001)
Age	0.029 (0.002)	0.028 (0.002)	0.025 (0.002)	0.024 (0.002)
Age squared	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Mid education	0.125 (0.013)	0.006 (0.001)	0.001 (0.001)	-0.001 (0.001)
High education	0.396 (0.011)	0.104 (0.005)	0.072 (0.005)	0.051 (0.002)
Hours worked (ln)	0.703 (0.045)	0.828 (0.012)	0.852 (0.008)	0.820 (0.012)
Long term contract	0.099 (0.010)	0.016 (0.002)	0.021 (0.001)	0.010 (0.001)
Mid qualification	0.126 (0.004)	0.056 (0.002)	0.050 (0.002)	0.032 (0.002)
High qualification	0.384 (0.006)	0.137 (0.002)	0.124 (0.003)	0.083 (0.003)
Workers (ln)	0.063 (0.001)	0.030 (0.002)	0.033 (0.003)	0.042 (0.002)
R2	0.66	0.93	0.95	0.95
N	19,330,720	18,237,603	18,158,177	16,367,142
Occupation	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES	YES	YES
Firm FE			YES	YES
Worker & Firm FE				YES

Robust standard errors clustered by municipality in brackets

Table 5. Effect of the reform on wage by gender and managerial position

	1	2	3	4
Entry deregulation	-0.0175 (0.0068)	0.0031 (0.0025)	0.0015 (0.0023)	0.0014 (0.0025)
Female	-0.1951 (0.0060)			
Entry deregulation*Female	0.0099 (0.0049)	-0.0082 (0.0017)	-0.0046 (0.0013)	-0.0026 (0.0016)
Managerial position	0.1471 (0.0158)			
Entry deregulation*Managerial position	0.0933 (0.0367)	0.0534 (0.0047)	0.0512 (0.0038)	0.0472 (0.0036)
Female*Managerial position	-0.0037 (0.0103)			
Entry deregulation*Female*Managerial position	-0.0155 (0.0131)	-0.0045 (0.0021)	-0.0070 (0.0026)	-0.0077 (0.0022)
Age	0.0286 (0.0018)	0.0280 (0.0019)	0.0252 (0.0016)	0.0247 (0.0018)
Age squared	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)
Mid education	0.1219 (0.0122)	0.0067 (0.0011)	0.0016 (0.0006)	-0.0002 (0.0010)
High education	0.3756 (0.0107)	0.1028 (0.0046)	0.0713 (0.0049)	0.0494 (0.0023)
Hours worked (ln)	0.7033 (0.0450)	0.8283 (0.0122)	0.8519 (0.0080)	0.8198 (0.0124)
Long term contract	0.0962 (0.0096)	0.0163 (0.0020)	0.0215 (0.0014)	0.0105 (0.0009)
Mid qualification	0.1284 (0.0043)	0.0559 (0.0018)	0.0504 (0.0016)	0.0319 (0.0017)
High qualification	0.3656 (0.0057)	0.1380 (0.0023)	0.1245 (0.0026)	0.0833 (0.0027)
Workers (ln)	0.0635 (0.0014)	0.0300 (0.0019)	0.0325 (0.0026)	0.0413 (0.0020)
Constant	2.1326 (0.2215)	1.6863 (0.0665)	1.6378 (0.0371)	1.7845 (0.0446)
R2	0.67	0.93	0.95	0.95
N	19,330,720	18,237,603	18,158,177	16,367,142
Occupation FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES	YES	YES
Firm FE			YES	YES
Worker & Firm FE				YES

Robust standard errors clustered by municipality in brackets

Table 6: Effect of the reform on the likelihood of being promoted to managerial positions

	1	2	3	4
Entry deregulation	0.0030 (0.0021)	0.0063 (0.0032)	0.0061 (0.0025)	0.0063 (0.0023)
Female	-0.0063 (0.0017)			
Entry deregulation*Female	0.0018 (0.0018)	-0.0090 (0.0027)	-0.0087 (0.0021)	-0.0071 (0.0021)
Age	-0.0353 (0.0004)	-0.0676 (0.0012)	-0.0641 (0.0009)	-0.0579 (0.0008)
Age squared	0.0004 (0.0000)	0.0008 (0.0000)	0.0008 (0.0000)	0.0007 (0.0000)
Mid education	0.0069 (0.0019)	0.0008 (0.0012)	0.0014 (0.0010)	0.0049 (0.0011)
High education	0.0787 (0.0065)	-0.0334 (0.0036)	-0.0250 (0.0038)	-0.0159* (0.0069)
Hours worked	-0.0074 (0.0005)	0.0005+ (0.0003)	0.0013 (0.0003)	0.0027 (0.0002)
Mid qualification	-0.0273 (0.0010)	-0.0308 (0.0011)	-0.0323 (0.0013)	-0.0295 (0.0013)
High qualification	-0.0201 (0.0010)	-0.0532 (0.0024)	-0.0537 (0.0019)	-0.0506 (0.0024)
Workers (ln)	-0.0078 (0.0004)	-0.0075 (0.0007)	-0.0332 (0.0011)	-0.0362 (0.0012)
Long term contract	-0.1057 (0.0032)	-0.0563 (0.0031)	-0.0647 (0.0033)	-0.0693 (0.0043)
Constant	0.9648 (0.0137)	1.2933 (0.0345)	1.3303 (0.0306)	1.2398 (0.0287)
R2	0.13	0.33	0.37	0.35
N	19,977,543	18,878,984	18,800,218	16,951,500
Occupation FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES	YES	YES
Firm FE			YES	YES
Worker&Firm FE				YES

Robust standard errors clustered by municipality in brackets

FIGURES

Figure 1. Effect of the reform on the time needed to found a new business

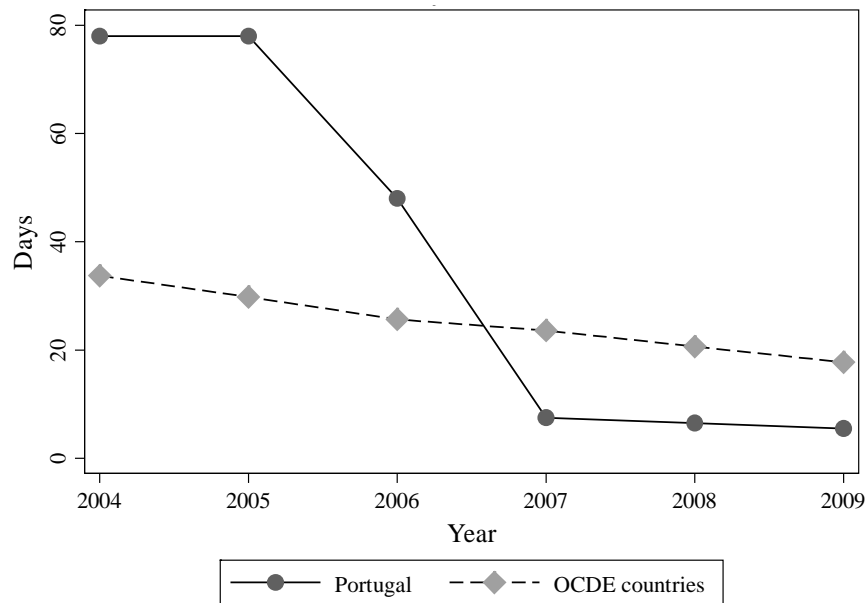


Figure 2. Effect of the reform on the number of new firms

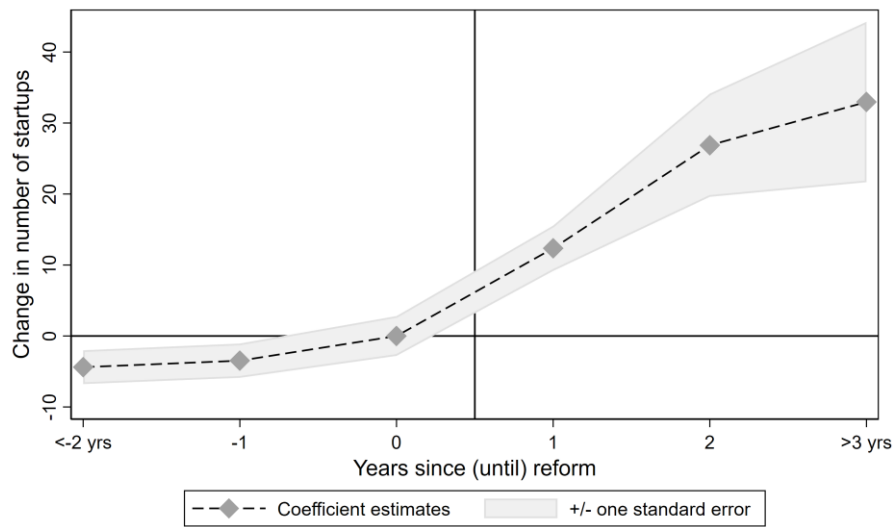


Figure 3. Effect on aggregate female–male entrepreneurship gap

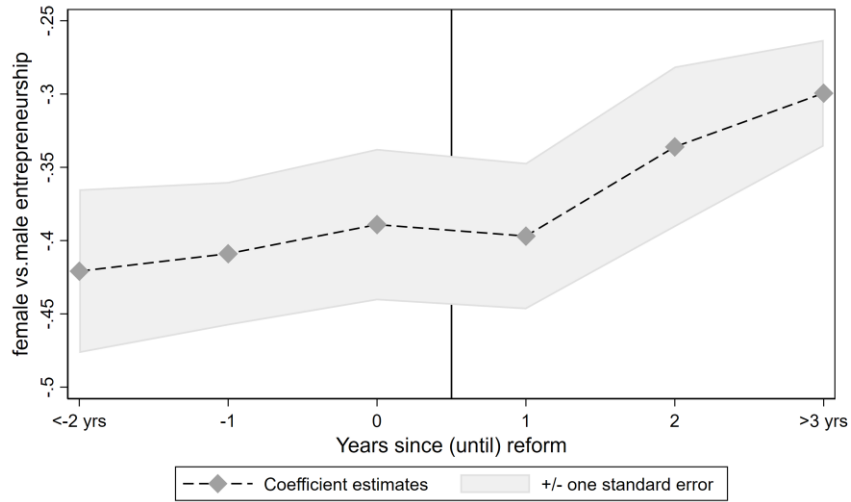
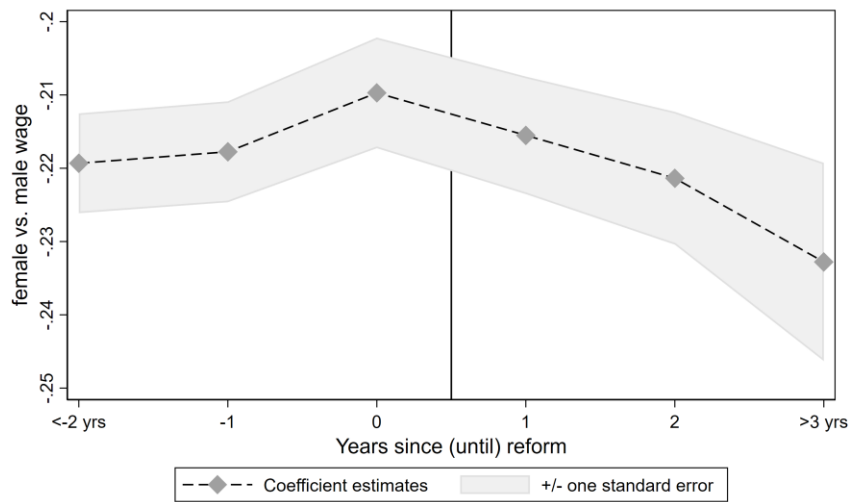


Figure 4. Effect on aggregate female–male wage gap



APPENDIX

Table A1. Reform enactment dates

Municipality	Year
Aveiro	2005
Barreiro	2005
Beja	2005
Braga	2005
Bragança	2005
Coimbra	2005
Guarda	2005
Lisboa	2005
Loulé	2005
Moita	2005
Sintra	2005
Vila Nova de Gaia	2005
Viseu	2005
Angra Do Heroísmo	2006
Bombarral	2006
Cascais	2006
Castelo Branco	2006
Chaves	2006
Évora	2006
Faro	2006
Funchal	2006
Gondomar	2006
Guimarães	2006
Leiria	2006
Maia	2006
Odivelas	2006
Ponta Delgada	2006
Portalegre	2006
Portimão	2006
Porto	2006
Santarém	2006
São João Da Madeira	2006
Setúbal	2006
Viana Do Castelo	2006
Vila Franca De Xira	2006
Vila Nova De Cerveira	2006
Vila Real	2006
Abrantes	2007
Águeda	2007

Alcácer Do Sal	2007
Caldas Da Rainha	2007
Celorico De Basto	2007
Covilhã	2007
Elvas	2007
Estremoz	2007
Figueira da Foz	2007
Fornos De Algodres	2007
Grândola	2007
Horta	2007
Lagos	2007
Lamego	2007
Mirandela	2007
Monção	2007
Montemor-O-Novo	2007
Oliveira do Bairro	2007
Pombal	2007
Santiago do Cacém	2007
Seia	2007
Serta	2007
Tomar	2007
Torres Vedras	2007
Vila Do Conde	2007
Vila Nova de Famalicão	2007
Vila Nova de Foz Côa	2007
Vila Real De Santo António	2007
Alcobaca	2008
Alfândega da Fé	2008
Aljezur	2008
Aljustrel	2008
Almada	2008
Almeida	2008
Cantanhede	2008
Espinho	2008
Fafe	2008
Felgueiras	2008
Figueira de Castelo Rodrigo	2008
Idanha-A-Nova	2008
Ílhavo	2008
Loures	2008
Macedo De Cavaleiros	2008
Matosinhos	2008

Moimenta Da Beira	2008
Montalegre	2008
Mora	2008
Moura	2008
Óbidos	2008
Odemira	2008
Oliveira de Azeméis	2008
Ovar	2008
Ponte Da Barca	2008
Ponte De Lima	2008
Ponte de Sor	2008
Santo Tirso	2008
São João Da Pesqueira	2008
Tondela	2008
Trofa	2008
Valença	2008
Valongo	2008
Vila Verde	2008
Alcanena	2009
Alenquer	2009
Arganil	2009
Armamar	2009
Arouca	2009
Arruda dos Vinhos	2009
Azambuja	2009
Barcelos	2009
Batalha	2009
Belmonte	2009
Borba	2009
Cadaval	2009
Caminha	2009
Campo Maior	2009
Cartaxo	2009
Castanheira De Pera	2009
Entroncamento	2009
Ferreira do Alentejo	2009
Ferreira do Zêzere	2009
Freixo de Espada à Cinta	2009
Lourinhã	2009
Mafra	2009
Mangualde	2009
Marco de Canaveses	2009

Marinha Grande	2009
Mortágua	2009
Murça	2009
Murtosa	2009
Nazaré	2009
Nelas	2009
Oliveira do Hospital	2009
Ourique	2009
Pedrógão Grande	2009
Penafiel	2009
Peniche	2009
Póvoa de Varzim	2009
Resende	2009
Rio Maior	2009
Seixal	2009
Serpa	2009
Sobral de Monte Agraço	2009
Tavira	2009
Valpaços	2009
Vila Flor	2009
Vimioso	2009
Vouzela	2009

Table A2. List of industries

- 1 - Agriculture, Livestock, Hunting and Forestry
- 2 - Fishing
- 3 - Extraction of Energy Products
- 4 - Extractive Industries Excluding Extraction of Energy Products
- 5 - Food, Beverage and Tobacco Industries
- 6 - Textile Industry
- 7 - Leather and Leather Products Industry
- 8 - Industries of Madeira and Cork and their Works
- 9 - Pulp and Paper Industries and their Articles, Edition and Printing
- 10 - Manufacture of Coke, Refined Petroleum Products and Nuclear Fuel
- 11 - Manufacture of Chemicals and Synthetic or Artificial Fibers
- 12 - Manufacture of Articles of Rubber and Plastics
- 13 - Manufacture of Other Non-Metallic Mineral Products
- 14 - Basic Metallurgical Industries and Metal Products
- 15 - Manufacture of Machinery and Equipment N.E.
- 16 - Manufacture of Electrical and Optical Equipment
- 17 - Manufacture of Transportation Equipment
- 18 - Manufacturing Industries N.E.
- 19 - Production and Distribution of Electricity, Gas and Water
- 20 - Construction
- 21 - Wholesale and Retail, Repair of Motor Vehicles, Motorcycles and Personal and Household Goods
- 22 - Accommodation and Restaurant (Restaurants and Similar)
- 23 - Transport, Storage and Communications
- 24 - Financial Activities
- 25 - Real Estate Activities, Rental and Business Services
- 26 - Public Administration, Defense and Compulsory Social Security
- 27 - Education
- 28 - Health and Social Action
- 29 - Other Collective, Social and Personal Services Activities
- 30 - Families with Domestic Employees

Table A3. Effect of the reform on the number of new firms

	(1)	(2)	(3)	(4)
	Startups number	Log startups number	Startups number	Log startups number
Entry deregulation	12.7970 (3.0131)	0.0627 (0.0219)	0.5516 (0.1301)	0.0396 (0.0092)
Average income (ln)	-27.3862 (7.2001)	-0.6471 (0.1641)	-1.4936 (0.3708)	-0.1624 (0.0446)
Total population (ln)	22.6605 (7.3330)	0.3575 (0.1480)	1.1921 (0.3714)	0.1289 (0.0457)
Inactive population (%)	-0.7403 (0.2411)	-0.0158 (0.0026)	-0.0383 (0.0118)	-0.0042 (0.0008)
Constant	42.8024 (65.0893)	4.6729 (1.7201)	2.0684 (3.3715)	0.5270 (0.4992)
Observations	2,766	2,766	58,346	58,346
R2	0.20	0.22	0.03	0.03
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Industry FEs	No	No	Yes	Yes

Robust standard errors clustered by municipality in brackets

Table A4. Effect of the reform on wage – pay-for-performance component

	1	2	3	4
Entry deregulation	0.0326 (0.0219)	0.0445 (0.0191)	0.0373 (0.0193)	0.0287 (0.0202)
Female	-0.3360 (0.0168)			
Entry deregulation*Female	-0.0700 (0.0220)	-0.1016 (0.0144)	-0.0736 (0.0125)	-0.0553 (0.0138)
Age	0.0098 (0.0017)	0.0331 (0.0032)	0.0274 (0.0036)	0.0300 (0.0046)
Age squared	-0.0001 (0.0000)	-0.0004 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0001)
Mid education	0.0916 (0.0157)	0.0433 (0.0101)	0.0016 (0.0068)	-0.0033 (0.0111)
High education	-0.1302 (0.0180)	-0.0186 (0.0165)	0.0107 (0.0230)	0.0564 (0.0317)
Hours worked (ln)	0.2240 (0.0075)	0.2219 (0.0070)	0.2299 (0.0077)	0.2212 (0.0076)
Long term contract	-0.2341 (0.0166)	-0.1167 (0.0156)	-0.0507 (0.0131)	-0.0515 (0.0158)
Mid qualification	0.1648 (0.0148)	0.0471 (0.0077)	0.0059 (0.0067)	0.0040 (0.0091)
High qualification	0.1562 (0.0161)	0.0099 (0.0188)	-0.0167 (0.0166)	-0.0102 (0.0190)
Workers (ln)	0.1949 (0.0062)	0.2004 (0.0049)	0.1212 (0.0125)	0.1114 (0.0147)
Constant	-0.7750 (0.0463)	-1.3048 (0.0826)	-0.9158 (0.1002)	-0.8735 (0.1070)
R2	0.08	0.54	0.60	0.63
N	19,977,543	18,878,984	18,800,218	16,951,500
Occupation FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES	YES	YES
Firm FE			YES	YES
Worker&Firm FE				YES

Robust standard errors clustered by municipality in brackets

Table A5. Effect of the reform on wage by gender: state-owned versus private firm

	1	2	3	4
Entry deregulation	-0.0100 (0.0038)	0.0081 (0.0031)	0.0064 (0.0030)	0.0060 (0.0031)
Female	-0.1970 (0.0056)			
Entry deregulation*Female	0.0060 (0.0044)	-0.0097 (0.0015)	-0.0064 (0.0013)	-0.0043 (0.0014)
State owned firm	0.0493 (0.0397)			
Entry deregulation*State owned firm	0.0948 (0.0161)	0.0154 (0.0053)	0.0168 (0.0054)	0.0161 (0.0053)
Female*State owned firm	0.1599 (0.0147)			
Entry deregulation*Female*State owned firm	0.0129 (0.0122)	0.0401 (0.0087)	0.0347 (0.0093)	0.0313 (0.0095)
Age	0.0292 (0.0019)	0.0277 (0.0018)	0.0249 (0.0016)	0.0245 (0.0017)
Age squared	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)
Mid education	0.1249 (0.0122)	0.0063 (0.0010)	0.0012 (0.0006)	-0.0005 (0.0010)
High education	0.3963 (0.0112)	0.1036 (0.0046)	0.0721 (0.0049)	0.0505 (0.0024)
Hours worked (ln)	0.7025 (0.0447)	0.8283 (0.0122)	0.8519 (0.0080)	0.8198 (0.0124)
Long term contract	0.0987 (0.0097)	0.0163 (0.0020)	0.0213 (0.0013)	0.0102 (0.0009)
Mid qualification	0.1262 (0.0044)	0.0557 (0.0018)	0.0502 (0.0016)	0.0317 (0.0017)
High qualification	0.3830 (0.0056)	0.1373 (0.0024)	0.1237 (0.0028)	0.0825 (0.0029)
Workers (ln)	0.0631 (0.0015)	0.0300 (0.0019)	0.0327 (0.0026)	0.0416 (0.0020)
Constant	2.2094 (0.2195)	1.6936 (0.0658)	1.6438 (0.0369)	1.7893 (0.0449)
R2	0.66	0.93	0.95	0.95
N	19,330,720	18,237,603	18,158,177	16,367,142
Occupation	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES	YES	YES
Firm FE			YES	YES
Worker & Firm FE				YES

Robust standard errors clustered by municipality in brackets

Table A6. Effect of the reform on wage – industry gender pay-gap

	1	2	3	4
Entry deregulation	0.0102 (0.0053)	0.0127 (0.0046)	0.0108 (0.0046)	0.0101 (0.0046)
Female	-0.1518 (0.0050)			
Entry deregulation*Female	-0.0033 (0.0042)	0.0027 (0.0016)	0.0038 (0.0015)	0.0075 (0.0016)
Gender pay gap	0.1063 (0.0250)	0.0265 (0.0105)	0.0051 (0.0084)	-0.0120 (0.0086)
Entry deregulation*Gender pay gap	-0.1346 (0.0361)	-0.0308 (0.0135)	-0.0278 (0.0138)	-0.0267 (0.0144)
Female* Gender pay gap	-0.2376 (0.0197)	-0.0621 (0.0127)	0.0189 (0.0090)	0.0587 (0.0154)
Entry deregulation*Female*Gender pay gap	0.0877 (0.0175)	-0.0458 (0.0099)	-0.0386 (0.0077)	-0.0459 (0.0099)
Age	0.0294 (0.0019)	0.0277 (0.0018)	0.0249 (0.0016)	0.0245 (0.0017)
Age squared	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)
Mid education	0.1237 (0.0128)	0.0062 (0.0010)	0.0012 (0.0006)	-0.0005 (0.0010)
High education	0.3952 (0.0116)	0.1036 (0.0045)	0.0721 (0.0049)	0.0504 (0.0024)
Hours worked (ln)	0.7024 (0.0447)	0.8282 (0.0123)	0.8518 (0.0080)	0.8197 (0.0124)
Long term contract	0.0986 (0.0103)	0.0164 (0.0020)	0.0214 (0.0013)	0.0102 (0.0009)
Mid qualification	0.1270 (0.0046)	0.0556 (0.0019)	0.0501 (0.0016)	0.0316 (0.0017)
High qualification	0.3839 (0.0054)	0.1373 (0.0024)	0.1238 (0.0027)	0.0826 (0.0028)
Workers (ln)	0.0632 (0.0013)	0.0300 (0.0018)	0.0329 (0.0024)	0.0417 (0.0018)
Constant	2.1888 (0.2191)	1.6958 (0.0651)	1.6412 (0.0369)	1.7860 (0.0448)
R2	0.66	0.93	0.95	0.95
N	19,319,837	18,226,663	18,147,279	16,357,696
Occupation	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES	YES	YES
Firm FE			YES	YES
Worker & Firm FE				YES

Robust standard errors clustered by municipality in brackets

Table A7. Effect of the reform on entrepreneurship – industry female representation

	1	2
Entry deregulation	-0.0004 (0.0004)	-0.0002 (0.0005)
Female	-0.0017 (0.0002)	
Entry deregulation*Female	0.0011 (0.0002)	-0.0007 (0.0003)
Female representation	-0.0004 (0.0004)	0.0084 (0.0008)
Entry deregulation*Female representation	0.0015 (0.0005)	-0.0008 (0.0006)
Female*Female representation	0.0013 (0.0004)	-0.0124 (0.0010)
Entry deregulation*Female*Female representation	-0.0002 (0.0004)	0.0059 (0.0008)
Age	0.0008 (0.0000)	0.0011 (0.0001)
Age squared	-0.0000 (0.0000)	-0.0000 (0.0000)
Mid education	0.0013 (0.0001)	0.0024 (0.0002)
High education	-0.0022 (0.0003)	0.0010 (0.0004)
Hours worked (ln)	-0.0071 (0.0002)	-0.0098 (0.0003)
Mid qualification	0.0004 (0.0001)	0.0016 (0.0002)
High qualification	0.0029 (0.0001)	0.0123 (0.0009)
Workers (ln)	-0.0012 (0.0000)	-0.0045 (0.0001)
Constant	0.0584 (0.0009)	0.1228 (0.0043)
R2	0.06	0.27
N	21,569,650	20,463,276
Occupation FE	YES	YES
Year FE	YES	YES
Municipality FE	YES	YES
Worker FE		YES

Robust standard errors clustered by municipality in brackets

Table A8. Effect of the reform on wage – industry female representation

	1	2	3	4
Entry deregulation	0.0253 (0.0095)	0.0165 (0.0046)	0.0138 (0.0044)	0.0127 (0.0047)
Female	-0.2014 (0.0098)			
Entry deregulation*Female	-0.0198 (0.0087)	-0.0026 (0.0037)	0.0011 (0.0028)	0.0076 (0.0033)
Female representation	-0.0709 (0.0168)	-0.0077 (0.0093)	-0.0132 (0.0081)	-0.0105 (0.0084)
Entry deregulation*Female representation	-0.0953 (0.0261)	-0.0240 (0.0080)	-0.0202 (0.0075)	-0.0188 (0.0085)
Female*Female representation	0.0297 (0.0164)	-0.0030 (0.0134)	0.0267 (0.0102)	0.0182 (0.0155)
Entry deregulation*Female* Female representation	0.0754 (0.0177)	-0.0046 (0.0065)	-0.0077 (0.0056)	-0.0155 (0.0060)
Age	0.0293 (0.0020)	0.0276 (0.0018)	0.0248 (0.0015)	0.0244 (0.0017)
Age squared	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)
Mid education	0.1258 (0.0125)	0.0063 (0.0010)	0.0012 (0.0006)	-0.0005 (0.0010)
High education	0.3978 (0.0114)	0.1039 (0.0046)	0.0721 (0.0049)	0.0506 (0.0024)
Hours worked (ln)	0.7032 (0.0447)	0.8283 (0.0123)	0.8518 (0.0080)	0.8197 (0.0124)
Long term contract	0.1002 (0.0100)	0.0163 (0.0020)	0.0214 (0.0013)	0.0102 (0.0010)
Mid qualification	0.1227 (0.0047)	0.0555 (0.0019)	0.0502 (0.0016)	0.0316 (0.0017)
High qualification	0.3804 (0.0055)	0.1371 (0.0024)	0.1237 (0.0028)	0.0823 (0.0029)
Workers (ln)	0.0634 (0.0015)	0.0300 (0.0019)	0.0328 (0.0026)	0.0418 (0.0019)
Constant	2.2296 (0.2181)	1.6998 (0.0646)	1.6452 (0.0370)	1.7917 (0.0450)
R2	0.66	0.93	0.95	0.95
N	19,319,837	18,226,663	18,147,279	16,357,696
Occupation FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES	YES	YES
Firm FE			YES	YES
Worker&Firm FE				YES

Robust standard errors clustered by municipality in brackets

Table A9. Effect of the reform on entrepreneurship – startups with a number of employees equal or higher than 5 employees

	1	2	3	4
Entry deregulation	0.0001 (0.0003)	-0.0002 (0.0003)	0.0015 (0.0002)	0.0020 (0.0002)
Female	-0.0007 (0.0001)		-0.0011 (0.0001)	
Entry deregulation*Female	0.0009 (0.0001)	0.0015 (0.0002)	0.0001 (0.0001)	0.0005 (0.0002)
Managerial position			-0.0133 (0.0017)	
Entry deregulation*Managerial position			-0.0108 (0.0019)	-0.0147 (0.0019)
Female*Managerial position			0.0030 (0.0004)	
Entry deregulation*Female*Managerial position			0.0025 (0.0005)	0.0030 (0.0005)
Age	0.0006 (0.0000)	0.0006 (0.0001)	0.0007 (0.0000)	0.0003 (0.0001)
Age squared	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
Mid education	0.0008 (0.0001)	0.0014 (0.0001)	0.0010 (0.0001)	0.0013 (0.0001)
High education	-0.0015 (0.0003)	0.0001 (0.0004)	0.0001 (0.0004)	0.0004 (0.0004)
Hours worked (ln)	-0.0052 (0.0002)	-0.0069 (0.0003)	-0.0052 (0.0002)	-0.0069 (0.0003)
Mid qualification	0.0003 (0.0001)	0.0012 (0.0002)	0.0001+ (0.0001)	0.0011 (0.0002)
High qualification	0.0021 (0.0001)	0.0084 (0.0006)	0.0037 (0.0003)	0.0081 (0.0006)
Workers (ln)	-0.0007 (0.0000)	-0.0027 (0.0001)	-0.0007 (0.0000)	-0.0027 (0.0001)
Constant	0.0408 (0.0007)	0.0878 (0.0029)	0.0465 (0.0017)	0.0924 (0.0032)
R2	0.04	0.26	0.05	0.26
N	21,409,422	20,304,295	21,409,422	20,304,295
Occupation FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES		YES

Robust standard errors clustered by municipality in brackets

Table A10. Effect of the reform on wage by gender: firms with vs. without female employee attrition

	1	2	3	4
Entry deregulation	-0.0340 (0.0071)	-0.0014 (0.0030)	0.0020 (0.0023)	0.0001 (0.0024)
Female	-0.1962 (0.0057)			
Entry deregulation*Female	0.0259 (0.0058)	0.0035 (0.0022)	0.0054 (0.0012)	0.0076 (0.0015)
Entry deregulation*Attrition	0.0336 (0.0072)	0.0129 (0.0042)	0.0060 (0.0039)	0.0080 (0.0041)
Female*Entry deregulation* Attrition	-0.0283 (0.0060)	-0.0167 (0.0021)	-0.0136 (0.0019)	-0.0141 (0.0023)
Age	0.0293 (0.0020)	0.0277 (0.0018)	0.0249 (0.0015)	0.0245 (0.0017)
Age squared	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)	-0.0003 (0.0000)
Mid education	0.1252 (0.0126)	0.0064 (0.0010)	0.0012 (0.0006)	-0.0005 (0.0010)
High education	0.3959 (0.0111)	0.1036 (0.0046)	0.0720 (0.0049)	0.0505 (0.0024)
Hours worked (ln)	0.7026 (0.0448)	0.8283 (0.0122)	0.8518 (0.0080)	0.8198 (0.0124)
Long term contract	0.0992 (0.0100)	0.0162 (0.0019)	0.0213 (0.0013)	0.0101 (0.0010)
Mid qualification	0.1267 (0.0044)	0.0557 (0.0018)	0.0502 (0.0016)	0.0316 (0.0017)
High qualification	0.3839 (0.0060)	0.1372 (0.0024)	0.1238 (0.0028)	0.0825 (0.0029)
Workers (ln)	0.0628 (0.0014)	0.0298 (0.0020)	0.0326 (0.0026)	0.0416 (0.0020)
Constant	2.2063 (0.2217)	1.6943 (0.0655)	1.6443 (0.0369)	1.7894 (0.0451)
R2	0.66	0.93	0.95	0.95
N	19,330,720	18,237,603	18,158,177	16,367,142
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES	YES	YES
Worker FE		YES	YES	YES
Firm FE			YES	YES
Worker & Firm FE				YES

Robust standard errors clustered by municipality in brackets

Table A11. Effect of the reform on entrepreneurship – female employees above and below fertility age

	Above fertility age		Below fertility age	
	1	2	3	4
Entry deregulation	0.0001 (0.0002)	-0.0002 (0.0002)	0.0002 (0.0003)	-0.0004 (0.0004)
Female	-0.0007 (0.0001)		-0.0007 (0.0002)	
Entry deregulation*Female	0.0007 (0.0001)	0.0014 (0.0001)	0.0008 (0.0002)	0.0020 (0.0003)
Age	-0.0000 (0.0001)	-0.0013 (0.0003)	0.0019 (0.0001)	0.0031 (0.0002)
Age squared	-0.0000 (0.0000)	0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
Mid education	0.0020 (0.0001)	0.0017 (0.0003)	0.0007 (0.0001)	0.0024 (0.0002)
High education	0.0038 (0.0003)	0.0011 (0.0011)	-0.0056 (0.0003)	0.0003 (0.0004)
Hours worked (ln)	-0.0034 (0.0002)	-0.0050 (0.0002)	-0.0091 (0.0004)	-0.0114 (0.0004)
Mid qualification	-0.0003 (0.0001)	0.0011 (0.0002)	0.0003 (0.0001)	0.0011 (0.0002)
High qualification	0.0004 (0.0001)	0.0073 (0.0005)	0.0033 (0.0001)	0.0122 (0.0009)
Workers (ln)	-0.0009 (0.0000)	-0.0059 (0.0001)	-0.0012 (0.0000)	-0.0040 (0.0001)
Constant	0.0374 (0.0024)	0.1157 (0.0090)	0.0684 (0.0012)	0.1276 (0.0051)
R2	0.03	0.28	0.09	0.29
N	6,382,293	5,940,178	15,199,396	14,260,314
Occupation FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Municipality FE	YES	YES		YES
Worker FE		YES		

Robust standard errors clustered by municipality in brackets

Table A12. Exogeneity of the shock

VARIABLES	(1) Entry ` deregulation	(2) Entry deregulation	(3) Entry deregulation	(4) Entry deregulation	(5) Entry deregulation	(6) Entry deregulation	(7) Entry deregulation	(8) Entry deregulation
Entry rate		0.290 (0.204)			-0.0652 (0.234)			-0.0715 (0.236)
Male-female entry rate gap			0.308 (0.738)			0.212 (0.716)		0.235 (0.721)
Male-female wage gap				-0.0616 (0.0860)			-0.0746 (0.117)	-0.0738 (0.117)
Average income	-0.0876 (0.0815)	-0.0846 (0.0819)	-0.0869 (0.0814)	-0.0610 (0.0859)	0.0374 (0.0972)	0.0393 (0.0969)	0.0642 (0.102)	0.0636 (0.102)
Total population (ln)	0.0844 (0.0563)	0.0847 (0.0558)	0.0844 (0.0565)	0.0856 (0.0563)	0.0642 (0.0525)	0.0643 (0.0522)	0.0662 (0.0522)	0.0656 (0.0526)
Fraction of inactive people	-0.0180 (0.0509)	-0.0179 (0.0508)	-0.0181 (0.0509)	-0.0193 (0.0506)	-0.0105 (0.0593)	-0.0107 (0.0591)	-0.0124 (0.0585)	-0.0120 (0.0587)
Constant	-0.281 (0.735)	-0.313 (0.735)	-0.286 (0.735)	-0.440 (0.747)	151.0 (4.348)	151.0 (4.379)	151.5 (4.465)	151.4 (4.458)
Observations	2,253	2,253	2,253	2,253	2,253	2,253	2,253	2,253
R-squared	0.142	0.142	0.142	0.142	0.403	0.403	0.403	0.403
Number of municipality	308	308	308	308	308	308	308	308
Municipality FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-year trend FE	No	No	No	No	Yes	Yes	Yes	Yes

Robust standard errors clustered by municipality in brackets