

# FINANCIAL CONSTRAINTS AND SELECTION INTO ENTREPRENEURSHIP\*

Annika Bacher, Andreas Fagereng, Marius Ring, and Ella Getz Wold

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## Abstract

We exploit a reduction in the minimum capital required to incorporate a limited liability company in Norway to study selection into entrepreneurship. We find that lowering the capital requirement from \$17,000 to \$5,000 roughly doubles the number of incorporations, indicating a large presence of marginal entrepreneurs sensitive to policy-induced reductions in financial constraints. We further study how the marginal entrepreneur differs from the average entrepreneur by contrasting the characteristics of pre- and post-reform entrants. We find no evidence that marginal entrepreneurs are of lower quality: they do not have lower IQ scores, lower prior incomes, or less education. While marginal entrepreneurs do create smaller firms in terms of assets and revenues, there is no clear indication that they have lower profitability. Our findings are consistent with a simple model of selection into entrepreneurship where the entrepreneur's liquidity is uncorrelated with entrepreneurial ability and the constraint that entrepreneurial profits exceed opportunity costs rarely binds.

*Keywords:* Entrepreneurship, ability, selection, incorporation

*JEL codes:* G50, G38, G31, J24

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# 1 Introduction

Entrepreneurship is considered to drive economic growth by both policy makers and economists. As a consequence, policies aimed at facilitating more entrepreneurial activity is ubiquitous across the developed world. Governments particularly strive to lessen the financial hurdles faced by potential entrepreneurs in order to facilitate more economic growth. However, there is looming uncertainty regarding whether the *marginal* entrepreneurial entries caused by these policies add any economic value due to a quality-quantity tradeoff (Schoar 2010, Hurst and Pugsley 2011, Guzman and Stern 2020, Bonelli, Liebersohn, and Lyonnet 2021). One example is when entrepreneurial ability is correlated with personal liquidity. In this case, relaxing financial constraints facilitates the entry of lower-ability entrepreneurs who may add little to economic value.

To better understand how policies aimed at reducing financial barriers affects selection into entrepreneurship, we exploit a 2012 reform that lowered the required amount of capital to incorporate a limited liability company in Norway. Prior to the reform, all firms needed to incorporate with at least \$17,000 of equity. To encourage more business creation, the government lowered this equity requirement to \$5,000 in 2012. We find that this reform was quite successful in that it led to a persistent doubling of annual incorporations. This large effect on business creation is not simply driven by expanding conglomerates. We find that incorporation rates double even among ex-ante non-entrepreneurs, which indicates that there was a substantial mass of “marginal” entrepreneurs sensitive to modest reductions in financial barriers to entrepreneurship.

Levine and Rubinstein (2017) argue that it is the incorporated entrepreneurs, as opposed to sole-proprietors, who drive economic growth. They further hypothesize that true entrepreneurs either incorporate or do not become entrepreneurs. This hypothesis applied to our setting implies that we should not see a substitution away from sole-proprietorship entries in favor of incorporations as a result of the reform, which is what we find. While incorporation rates double, there is no discernible reduction in the amount of new sole-proprietorships. However, we do find a sizable effect on whether ex-ante sole-proprietors choose to incorporate. This indicates an overlap between incorporated entrepreneurs and sole-proprietors and suggests that many sole-proprietors would have become incorporated entrepreneurs had they had more capital.

We develop a simple model of selection into entrepreneurship to better understand the effects of a capital requirement reduction. Our model has the standard feature that individuals only chose entrepreneurship if the expected payoff exceeds that of some outside option, for example, from continuing as an employee. There are two key forces that determine whether marginal entrants are of higher or lower ability. (i) The outside option

constraint works to increase average ability as it positively selects on ability among potential entrepreneurs for whom the equity requirement no longer binds. On the other hand, (ii) if liquidity is positively correlated with ability, then lowering the equity requirement causes an entry of lower-liquidity and (on average) lower ability entrepreneurs. The model predicts that new entrepreneurs are of the same quality if these two channels cancel out, which occurs, for example, when the outside-option constraint never binds and ability and liquidity are uncorrelated.

By combining data from the business registries with tax returns, educational attainment registers, and military enlistment test scores, we address this theoretical ambiguity by examining differences in the characteristics of entrepreneurs before and after the reform. We find no evidence that marginal entrepreneurs differ on cognitive ability, educational attainment, or prior income levels.

Our next analyses consider ex-post outcomes of firms. Our evidence is mixed. We find no evidence that post-reform entrants are less likely to be economically active six years later, nor do we find any evidence that they have lower profitability. We do, however, find evidence that these firms are considerably smaller in terms of assets and revenues. In the year of incorporation, post-reform firms have \$100,000 less in total book assets. This asset gap grows over time, reaching \$200,000 by the end of our sample. These differences, even at incorporation, are considerably larger than the pure mechanical effect of reducing the equity requirement from \$17,000 to \$5,000, which is in part due to post-reform firms having less debt financing. At incorporation, we find that \$1 less in equity financing is associated with \$1.7 less in debt financing from banks or bondholders. Consistent with a sharp reduction in firm size in terms of assets, we also find that post-reform entrants have less revenue. By the end of our sample, post-reform entrants have approximately \$100,000 lower revenues. In terms of the total wage bill, we find a lower average labor cost of about \$40,000.

Overall, our findings favor the hypothesis based on a model in which personal liquidity and entrepreneurial ability are uncorrelated and would-be entrepreneurs are constrained by finances as opposed to high outside options. In such a model, policies that alleviate financial frictions and increase entrepreneurial are not necessarily subject to a quantity-quality tradeoff.

**Literature.** We contribute to a large and growing literature on financial frictions and entrepreneurship (see, e.g., [Herkenhoff, Phillips, and Cohen-Cole 2021](#), [Hvide and Møen 2010](#), [Fracassi, Garmaise, Kogan, and Natividad 2016](#), [Cespedes, Huang, and Parra 2019](#), [Andersen and Nielsen 2012](#), [Adelino, Schoar, and Severino 2015](#), [Ring 2023](#), [Schmalz, Sraer, and Thesmar 2017](#), [Hurst and Lusardi 2004](#), [Kerr, Kerr, and Nanda 2015](#), [Corradin and Popov 2015](#), [Chodorow-Reich, Nenov, Santos, and Simsek 2023](#)). In this literature, several papers present results at odds with whether financial frictions matter for entrepreneurship

(see, e.g., [Hurst and Lusardi 2004](#), [Andersen and Nielsen 2012](#), [Kerr, Kerr, and Nanda 2015](#), [Bos, Breza, and Liberman 2018](#).) For example, [Andersen and Nielsen \(2012\)](#) find that sole-proprietors who enter entrepreneurship following a liquidity shock underperform. Our findings are not inconsistent with this result due to the potentially large difference between sole-proprietor entrepreneurs and incorporated entrepreneurs (see, e.g., [Berglann et al. 2011](#), [Levine and Rubinstein 2017](#), [Bellon, Cookson, Gilje, and Heimer 2021](#)). While several studies document that positive wealth shocks induce entrepreneurial entry, and often improve entrepreneurial outcomes conditional on entry (e.g., [Schmalz, Sraer, and Thesmar 2017](#)), these results do not allow us to draw inference on whether the marginal entrant is of high ability. These results could be consistent with lower-quality entrepreneurs entering due to reduced barriers and then, conditional on entry, being able to scale up their business more due to eased financing constraints.

We also contribute to a growing literature on business regulation and entrepreneurship ([Djankov, La Porta, Lopez-de Silanes, and Shleifer 2002](#), [Klapper, Laeven, and Rajan 2006](#), [Branstetter, Lima, Taylor, and Venâncio 2014](#), [Kaplan, Piedra, and Seira 2011](#), [Cui and Wei 2022](#), [Barwick, Chen, Li, and Zhang 2022](#), [Fang, Li, Wu, and Zhang 2023](#)). While several papers document that entry regulation hampers business formation, there is no consensus on whether easing these regulations facilitate value-added entrepreneurship. While [Djankov et al. \(2002\)](#) argue that business regulation has negative economy-wide effects, [Branstetter, Lima, Taylor, and Venâncio \(2014\)](#) find that deregulating lowers the quality of new firms in terms of the founders’ education levels and the firms’ survival probabilities. [Cui and Wei \(2022\)](#) and [Barwick et al. \(2022\)](#), on the other hand, find that deregulation causes the entry of higher-productivity entrepreneurs. Closest to our paper are [Cui and Wei \(2022\)](#) and [Barwick et al. \(2022\)](#) who exploit Chinese reforms that entirely or partially consisted of relaxing capital requirements for incorporating a firm. Our main contribution is to exploit detailed, third-party reported data on the entrepreneurs behind the incorporation that provides proxies for ability along several dimensions (e.g., education, cognitive ability, and past incomes) and data on whether they were previously unincorporated entrepreneurs. Another central contribution (shared with [Cui and Wei 2022](#)) is to isolate the effects of a capital requirement reduction from other start-up friendly policies such as easier registration procedures. Further related to our work is [Hombert, Schoar, Sraer, and Thesmar \(2020\)](#) who find no reduction in proxies for entrepreneurial ability following a french reform that limited the downside risk to entrepreneurship. We view our findings as complementary in the sense that we study a reform that relaxes financial barriers as opposed to risk-aversion barriers.

Our paper proceeds as follows. Section 2 introduces a conceptual framework to understand how the reform would affect selection into entrepreneurship. Section 3 discusses the

reform and the data. Section 4 provides the reduced-form results and Section 5 provides formal estimates on how the marginal entrepreneurs that entered following the reform differ from the existing entrepreneurs. Section 6 concludes.

## 2 Conceptual framework

The entrepreneurial profit function is given by

$$f(\theta_i, k_i) = \theta_i k_i, \quad (1)$$

where  $\theta_i > 0$  is entrepreneurial ability of individual  $i$  and  $k_i > 0$  is invested capital. As in Evans and Jovanovic (1989), an individual enters entrepreneurship only if entrepreneurial profits exceed some opportunity cost,  $s_i$ , which can be thought of as income from salaried employment:

$$\theta_i k_i \geq s_i. \quad (2)$$

We impose strict financing constraints:  $k_i$  can only be equity. Since the profit function is monotonically increasing in  $k_i$ , the entrepreneur would want to invest as much capital as possible. Hence, we interpret  $k_i$  as the amount of equity that the entrepreneur is able to furnish, i.e., her liquidity, coming either out of her own savings or from other investors.<sup>1</sup>

Next, we allow for a non-zero correlation between  $k_i$ , the entrepreneur's liquidity and ability,  $\theta_i$ . We further allow for a nonzero correlation between the opportunity cost,  $s_i$ , and ability:

$$k_i = k + \kappa \theta_i + \varepsilon_i, \quad (3)$$

$$s_i = s + \sigma \theta_i, \quad (4)$$

where  $\varepsilon_i$  is an idiosyncratic term. That is, some individuals may have more or less liquidity for reasons unrelated to their ability,  $\theta_i$ . We may now rewrite the selection equation (2) as

$$\underbrace{\theta_i(k + \kappa \theta_i + \varepsilon_i)}_{\text{Entrepreneurial profit}} \geq \underbrace{s + \sigma \theta_i}_{\text{Opportunity cost}} \quad (5)$$

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<sup>1</sup>In our setting, equity could be furnished by the entrepreneur taking up a personal loan and then using this as equity in the incorporated firm.

We now impose the capital requirement,

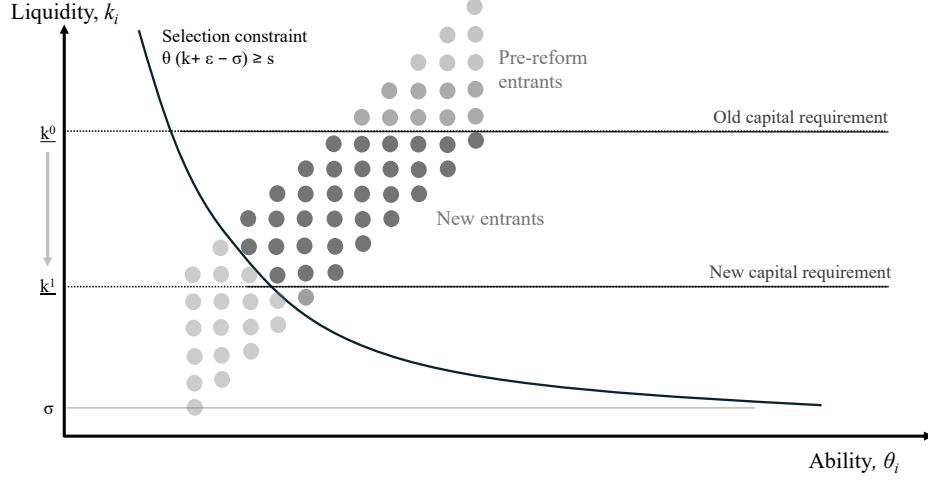
$$k_i \geq \underline{k}, \tag{6}$$

which in our model with no debt financing is equivalent to an equity requirement.

Under different sets of assumptions, a reduction in the equity requirement may have different implications for whether there is any effect on entry and whether new entrants have higher or lower ability.

**Case 1 (Ability and liquidity positively correlated.)** We illustrate the first case in Figure 1. Each dot represents one potential entrepreneur. With a positive correlation between capital and ability, we easily produce a case in which *a reduction in the equity requirement causes new new entrants to have lower average ability*. This is caused by the positive correlation between liquidity and ability. As we allow lower liquidity entrepreneurs to enter, we automatically select lower-ability entrepreneurs due to the positive correlation. We do not claim that a positive correlation between  $k_i$  and  $\theta_i$  unambiguously causes a reduction in average ability. We see that while the positive liquidity-ability gradient works in the direction of lowering average ability, the selection constraint works in the opposite direction. The lowest-ability entrepreneurs do not enter because their entrepreneurial profits do not exceed their opportunity cost (i.e., selection constraint still binds). However, it appears challenging to change the curvature of the selection constraint or shift the capital requirements in such a way that average ability increases, even for nonlinear relationships between  $k_i$  and  $\theta_i$ .

Figure 1: CONCEPTUAL FRAMEWORK, CASE 1: POSITIVE RELATIONSHIP BETWEEN PERSONAL LIQUIDITY AND ENTREPRENEURIAL ABILITY



**Case 2 (Ability and liquidity uncorrelated).** The second case is when ability and personal liquidity are uncorrelated. This mirrors the assumption in [Chodorow-Reich et al. \(2023\)](#), which studies the effect of quasi-experimental variation in liquidity. We describe below how this assumption leads to a case with *entry of new entrepreneurs but that the effect on average entrepreneurial ability is ambiguous*.

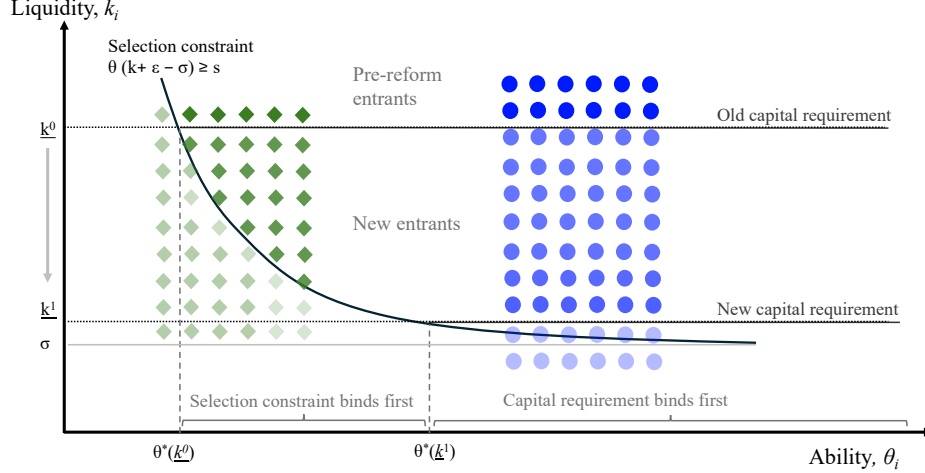
Formally,  $\kappa = 0$  and thus an individual enters if only if

$$k + \varepsilon_i \geq \underline{\kappa}, \quad (7)$$

$$\text{and } \theta_i(k + \varepsilon_i - \sigma) \geq s. \quad (8)$$

We see that in this case, lowering the equity requirement induces more entry of low  $\varepsilon_i$  entrepreneurs. We illustrate this effect in [Figure 2](#), where we lower  $\underline{\kappa}$  from  $\underline{\kappa}^0$  to  $\underline{\kappa}^1$ . We see that it is not clear whether new entrants are, on average, of lower ability: it will depend on whether the selection constraint (entrepreneurial profits  $\geq$  opportunity cost) ever binds for those who are affected by the reduced capital requirement. Similar to the theoretical framework in [Hombert, Schoar, Sraer, and Thesmar \(2020\)](#), the effect on selection depends on the distribution of ability.

Figure 2: CONCEPTUAL FRAMEWORK, CASE 2: NO CORRELATION BETWEEN PERSONAL LIQUIDITY AND ENTREPRENEURIAL ABILITY



The different sets of scatter points (green diamonds, blue circles) indicate different scenarios for the joint distribution of  $\varepsilon$  and  $\theta$ : each point represents one (potential) entrepreneur. The different scenarios are constructed such that  $\varepsilon$  is idiosyncratic, that is, not correlated with ability,  $\theta$ .

For example, in the green-diamond scenario, the joint distribution of  $\theta_i$  and  $\varepsilon_i$  is such that the effect of the capital requirement reduction is mediated by the selection constraint. In this scenario, average ability is increased. In the blue circle scenario, the effect of the capital requirement reduction is not mediated by the selection criteria, as all entrepreneurs have ability above the threshold,  $\theta^*$  which both the new capital requirement and the selection constraint binds. In this scenario the average ability of new entrants is the same. Empirically, we may have both scenarios at play, but if the density is higher for the high-ability entrepreneurs (i.e., more blue circles), the effect on average entrepreneurial ability may be statistically negligible. Note that which scenario is at play does not purely depend on the distribution of  $\theta$  and  $\varepsilon$ : it depends on their distribution given the parameters of the opportunity costs,  $s$  and  $\sigma$ . For example, if  $s = 0$ , we would always be in the blue circle scenario in which the selection constraint never binds.

We note that it is also possible to construct Case-2 scenarios in which average ability decreases even if liquidity and ability are uncorrelated. One example is when the distribution of  $\varepsilon$  becomes bi-modal for large  $\theta$ .

**Empirical implications.** Under different assumptions of the simple model above, we can generate different testable hypotheses. (i) We expect *an increase in the number of entrepreneurs* that are *of lower ability* if liquidity is positively correlated with entrepreneurial ability (Case 1). Alternatively, (ii) if liquidity is uncorrelated with entrepreneurial ability



and the joint distribution of ability and capital ( $\theta$  and  $\varepsilon$ ) is such that selection constraint never binds before the capital requirement, then we expect *an increase in the number of entrepreneurs* and no effect on the ability of the average new entrepreneur. Finally, (iii) if liquidity and ability are correlated, as in Case 2, and the selection constraint binds under the lower capital requirement, we expect to see an increase in the number of entrepreneurs and an average ability.

## 3 Data and empirical setting

### 3.1 Institutional setting

Since the first securities law in 1910, the Norwegian authorities have required that a minimum amount of equity must be injected into any limited liability company upon incorporation. The purpose was to protect creditors' interests (GOV, 2011). Between 1997 and 2011, the equity requirement was NOK 100,000 (\$17,000 using the 2012 exchange rate). This requirement was lowered to NOK 30,000 (\$5,000) effective January 2012, and the change was formally proposed by the ministry of justice in September 2011 (GOV, 2011). The main driver for change was that Norway wished to offer competitive economic conditions relative to, e.g., the U.K. which did not have a capital requirement,<sup>2</sup> and to reduce barriers to firm creation.<sup>3</sup> Following new EU rules in the early 2000s, firms in EU–EEA countries were free to incorporate in other EU–EEA countries. Becht, Mayer, and Wagner (2008) show that this led to substantial increases in U.K. incorporation originating from high-capital-requirement countries.

There are no specific restrictions on the source of the equity: it can come from the entrepreneurs' own equity, or debt, or from outside investors. Hence, for our theoretical model to apply, we need to consider personal liquidity as a broad measure of the amount of equity the entrepreneur can furnish for her firm.

To our knowledge, there are no other large changes to the economic conditions surrounding firm creation during 2012. Other reforms or changes might complicate the interpretation of our findings to the extent that these were the relevant changes to which the new entrants responded. The closest reform, to our knowledge, is the removal of an auditing requirement for small firms. Small firms that incorporated in May of 2011 or later could opt to not hire an auditor from incorporation onward. To address the concern that it is this reform that drives our results, our initial analyses study entry rates at the quarterly level. This reveals a sharp increase exactly when the capital requirement was reduced (first quarter of 2012) but no noticeable increase in the third or fourth quarters of 2011 when small firms no longer

<sup>2</sup>Countries that have a capital requirement include Germany, Spain, Denmark, Sweden, and Ireland.

<sup>3</sup>See Xu (2023) for recent study on the tradeoffs between investor protection and entrepreneurial activity.

needed to engage an auditor.

### 3.2 Data

We draw on comprehensive Norwegian register data that allow us to link firm and entrepreneur characteristics. Data from the business registers (“Virksomhets- og foretaks register”) provide a panel of firm characteristics such as the date when the unique organization number was assigned (i.e., when the firm was incorporated). Data from the role register (“Rolleregisteret”) provide a panel of (de-identified) identifiers for a firm’s proprietor, CEO, and board members. Using the stockholder register (“Aksjonærregisteret”), we see anonymized identifiers of all shareholders (both individuals and other firms) allowing us to link firms with their owners. We obtain data on firms’ financial characteristics from their tax returns (“Næringsoppgave 2”). The firm data primarily cover the years 2004–2018.

We obtain individual characteristics, such as year of birth, from the central population register. We obtain information on educational attainment as of 2010 from the national education database. We also include data on, e.g., past incomes, from individuals’ tax returns. Finally, we include de-identified data on individuals’ military enlistment scores. Most males aged 18–19 face mandatory interviews and testing by military enrollment officers. Our data include the cognitive ability scores. Ability is measured on a 1–9 (“Stanine”) scale, calibrated by the authorities such that five corresponds to an IQ of 100 and a unit difference corresponds to an IQ difference of 7.5. We adjust the raw test scores to account for the fact that the test was recalibrated (became stricter) in 1980.<sup>4</sup>

### 3.3 Definitions and sample selection

To be classified as the entrepreneur behind an incorporated firm, a person must be the CEO and own more than 1% of the shares. In order to link individuals with firms through indirect ownership,<sup>5</sup> we take the following approach. We first limit our data to ownership links of at least 1% of total shares. For shares owned by a second firm, we rank the owners in that second firm, keep the top 10 owners, remove ownership links  $< 10\%$ , and assign iterated ownership shares to the individuals who own shares in the second firm. That is, if a person owns 10% of firm A which owns 10% of firm B, then that person owns 1% of firm A. We then aggregate ownership shares at the firm-person-year level, allowing for both

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<sup>4</sup>For pre-1980 tests, we deduct the mean and add the post-1980 mean. This adjusted score is used when ability is an outcome variable, but not when it is used as a categorical variable in, e.g., histograms.

<sup>5</sup>In 2006, Norway introduced a dividend tax for dividends paid from corporations to private shareholders. This created an incentive to own economically active firms through another LLC in order to postpone realizing dividends.

direct and indirect ownership. We further aggregate ownership shares at the household (spouses) level.

For sole-proprietorships (“enkeltmannsforetak”), we define the entrepreneur as the proprietor (“innehaver”). For partnerships (“DA” and “ANS”), we select the partner that is also the CEO. If there is no partner-CEO, we select the chair of the board or, alternatively, the vice chair. For foreign-incorporated firms, we do not observe ownership, but assign the registered CEO as the entrepreneur. We identify the founding date from when the organization was assigned a unique organization identifier in the business register (“virksomhets- og foretaksregister”).

Our data contain 327,125 (domestic) incorporation events during 2004–2018. We ignore incorporation events of firms that belong to industry codes typically used by financial holding companies.<sup>6</sup> This leaves 232,116 incorporations. For 132,052 of the events, we can assign an individual as the entrepreneur, and for 47,566 of the events, the entrepreneur was not previously an entrepreneur; i.e., in the previous year, she was neither owner-CEO of an incorporated firm, a sole-proprietor, a CEO or board-member partner in a partnership, or the CEO of a foreign-incorporated firm.

To limit the impact of outliers when we consider firm-level data in levels, we limit (winsorize) revenues, wage costs, and assets to be non-negative and below their 95th percentiles. Profits are winsorized at the 5th and 95th percentiles.

## 4 Reduced-form results

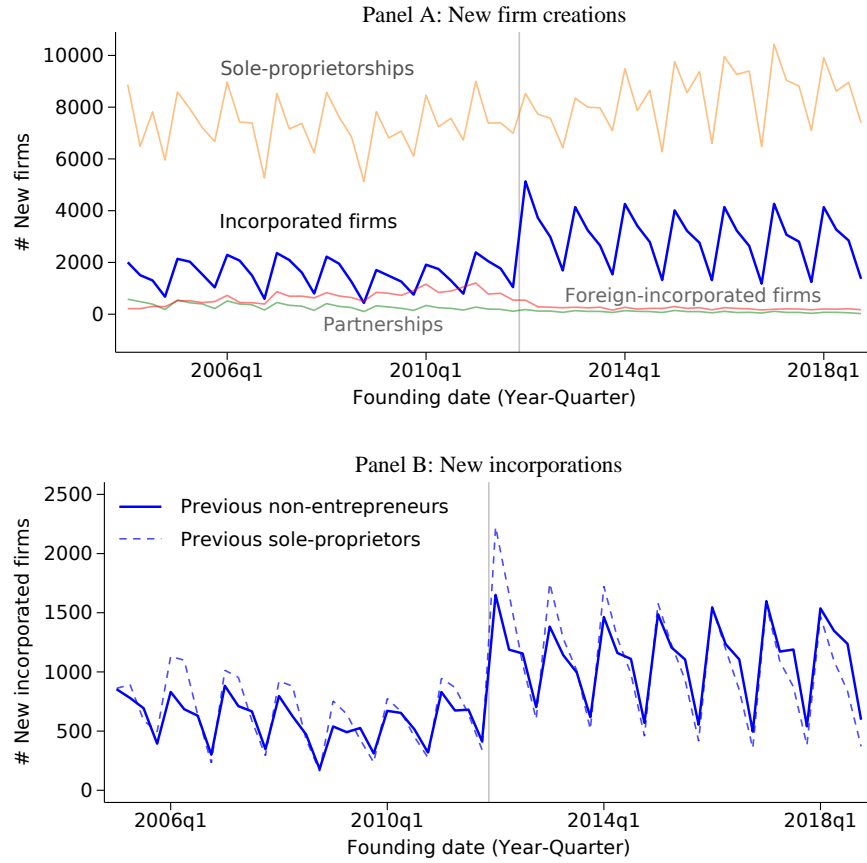
### 4.1 The effect on firm creations

Panel A of Figure 3 shows the number of firm creations over time. We see that immediately after the reform, the number of incorporations immediately doubles and stays at this higher level for the duration of our sample. The immediate response is reasonable, since entrepreneurs who are building a new firm will want to incorporate in order to expense start-up costs for tax purposes: that is, incorporating is likely one of the first steps in the process of establishing a new business.

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<sup>6</sup>two-digit NACEs codes 64 and 66 (financial and financial services), three-digit nace codes 681, 682, and 701 (real estate investments, real estate leasing and rental, and headquarter services).

Figure 3: FIRM CREATION BEFORE AND AFTER THE REFORM



Notes: In Panel A, we condition on being able to assign an entrepreneur to the firm creation (excluding, e.g., subsidiaries of listed companies). In Panel B, the solid blue line considers only incorporations done by individuals who were not previously entrepreneurs: neither incorporated (AS), sole-proprietor (ENK), CEO-partner of a partnership (ANS, DA), or CEO of a foreign-incorporated firm (NUF). The dashed blue line instead considers incorporations done by individuals who were (solely) sole-proprietor entrepreneurs in the previous year.

Panel A reveals no evidence of a substitution away from sole-proprietorship creation towards incorporations, which is consistent with the [Levine and Rubinstein \(2017\)](#) hypothesis that true entrepreneurs either incorporate or do not start a business. We further see no effect on partnerships that also do not benefit from limited liability. We do see a reduction in the registration rates of foreign-incorporated firms. Prior to 2012, one way to achieve the benefits of limited liability without having to put up the required amount of equity was to incorporate a limited liability company abroad (often in the U.K., where there were no capital requirements) and then register this company as a foreign-incorporated company (“NUF”) in Norway in order to do business. There were no rules prohibiting firms from taking this approach, even if their business activity was solely based in Norway. Accordingly, as

the capital requirement is removed in 2012, we see a reduced entry of foreign-incorporated firms. This reduction, however, is much too small and arises too early to explain the increase in incorporation rates. This indicates that there were many marginal incorporated entrepreneurs for whom the foreign-incorporation route was not an option.

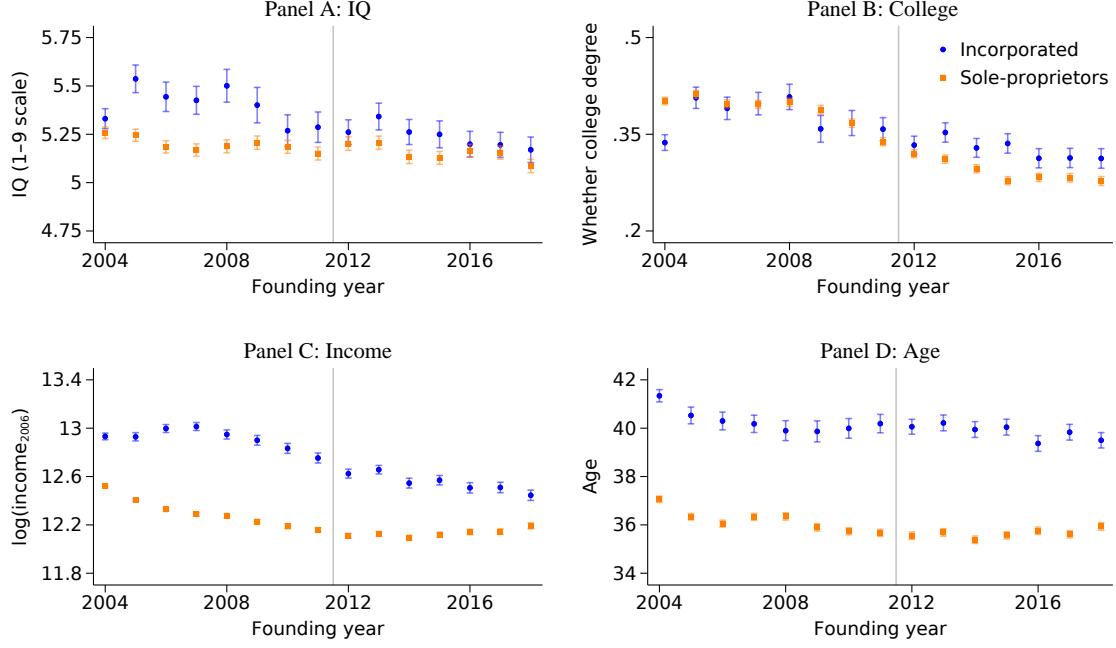
The increase in incorporations visible in Panel A may be driven by serial entrepreneurs or entrepreneurs who are simply expanding their conglomerates by incorporating new subsidiaries. To understand whether there was in fact an increase in entry into incorporated entrepreneurship, Panel B focuses on firms founded by individuals who were not already entrepreneurs in the previous year: they were neither incorporated entrepreneurs (AS), sole-proprietors (ENK), CEO-partner of a partnership (ANS, DA), or CEO of a foreign-incorporated firm (NUF). While this reduces the number of incorporations, there is still a noticeable doubling of incorporation dates. These findings indicate that there was a substantial effect on entrepreneurial entry. This conclusion is robust to also dropping any incorporations by entrepreneurs who were non-CEO owners ( $\geq 1\%$  of the shares) in any limited liability company in the previous year (see Appendix Figure [OA.1](#)).

While not part of our subsequent analysis sample, here we also consider incorporations done by individuals who were previously sole-proprietors but not incorporated (or partnership or foreign-incorporated) entrepreneurs. These findings (dashed blue line) reveal a similar effect. This is consistent with there being a large mass of marginal incorporated entrepreneurs in the sole-proprietor population. Our results thus indicate that reducing frictions to incorporations do not affect entry rates into sole-proprietorships but does cause exits—in the sense that existing sole-proprietors choose to incorporate. These findings suggest that adding some nuance to the [Levine and Rubinstein \(2017\)](#) hypothesis may be useful, and perhaps should allow for the notion that sole-proprietorship is a potential pathway to incorporated entrepreneurship.

## 4.2 The characteristics of new entrepreneurs

This section provides graphical reduced-form evidence on how the ex-ante characteristics differ across pre and post-reform incorporations. Later, in section [5](#), we introduce a simple regression-discontinuity design methodology that allows us to provide more formal estimates.

Figure 4: CHARACTERISTICS OF ENTREPRENEURS AROUND THE REFORM



Notes: All panels condition on firms created by individuals who were not entrepreneurs in the prior year. Panel A considers cognitive ability measured on a stanine scale (1 through 9), where 5 is calibrated to correspond to an IQ of 100 and a unit difference in the stanine scale corresponds to an IQ difference of 7.5. Panel B considers a dummy for whether an individual has obtained at least a college degree as of 2010. Income is total taxable personal income measured in 2006 Panel D considers the age of the entrepreneur. Standard errors underlying the 95% confidence bands are clustered at the person (entrepreneur) level.

Figure 3 shows how the characteristics of new entrepreneurs changed around the time of the reform. We are simply providing the mean characteristics of the entrepreneurs by estimating the following regression equation:

$$y_i = \alpha_{t,n} + \varepsilon_i, \quad (9)$$

where  $y_i$  is some characteristic of person  $i$  who is not an entrepreneur at time  $t - 1$ .  $\alpha_{t,n}$  are founding year ( $t$ )  $\times$  firm-type (corporation or sole-proprietorship) fixed effects.  $\varepsilon_i$  is the error term. Given the large effect on entry rates we observed in the previous section, if marginal entrepreneurs are considerably different from the average entrepreneurs, we would expect to see a change in characteristics shortly after the 2012 reform was enacted. For example, if we expect the marginal entrepreneur to differ on some characteristic,  $y$ , by  $-1$  and the reform doubled the number of entrants, we would expect to see a drop in the average  $y$  by  $\frac{1}{2}$  following the reform. We formalize this logic in Section 5.

Panel A considers military-enlistment scores of cognitive ability. The underlying sample largely contains males but does not condition on military enrollment, as virtually all males

in our dataset were required to undergo testing at age 18–19 regardless of whether they were selected for military service. We see that incorporated entrepreneurs generally have higher cognitive scores than sole-proprietors. There is some indication that this ability gap narrows over time, but this narrowing does not coincide with the reform in such a way that we would it causally to the 2012 reform.

Panel B considers educational attainment, measured by whether the individual has obtained a college degree or higher as of 2010. Educational attainment is found to be an important predictor of entrepreneurial success ([Bates 1990](#), [Queiró 2022](#)). While the average new incorporated entrepreneur after 2012 appears to be less likely to have a college degree, we also see this tendency, and even more so, among unincorporated entrepreneurs. Hence, it does not appear that reducing barriers to incorporation lead to a in-flux of less-educated entrepreneurs.

Panel C considers personal incomes measured in 2006. Personal income is a useful proxy to the extent that entrepreneurial ability and salary-earning ability are correlated (as in, e.g., [Hacamo and Kleiner 2022](#)). We see that incorporated entrepreneurs have significantly higher prior incomes than sole-proprietors, but we do not see any tendency that post-reform entrepreneurs had lower ex-ante incomes.

Panel D considers age at business creation. Using U.S. data, [Azoulay, Jones, Kim, and Miranda \(2020\)](#) find that the subsequently most successful startups were created by older individuals, suggesting that age may proxy for entrepreneurial ability.<sup>7</sup> We do find that incorporated entrepreneurs tend to be older by about 6–7 years, but there is no indication that post-reform entrepreneurs were either younger or older.

We also examine whether are differences in entrepreneurial traits among those who transitioned from sole-proprietor to incorporated entrepreneurship in Appendix Figure [OA.2](#). While we do not see clear evidence that post-reform transitional entrepreneurs were different, the evidence is less conclusive. There appear to be minor falls in IQ and past incomes for those who incorporated right after the reform, in 2012. Through the lens of our theoretical framework. Not too surprisingly, this mixed evidence suggests that personal assets and ability may be more strongly correlated in the population of sole-proprietors as opposed to in the non-entrepreneurial population.

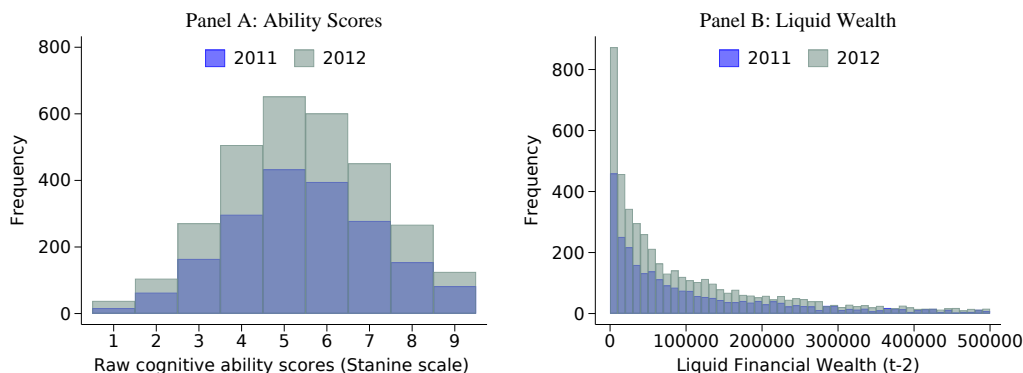
Figure 5 more closely studies distributional changes in cognitive ability scores and liquid financial wealth around the reform. Consistent with no effect on mean ability in the previous figure, we cannot discern any evidence that post-reform entrants tend to be of lower ability in Panel A. We see that the post-reform entrants come from the entire distribution. In Panel B, we consider the distributions of liquid financial wealth (deposits, bonds, listed

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<sup>7</sup>See also [Ouimet and Zarutskie \(2014\)](#) whose findings suggest the opposite relationship.

stocks) before and after the reform. Here, we see that most of the new entrants are indeed lower-liquidity individuals, and the modal new entrant has liquid wealth below NOK 10,000 (\$1,700).

Figure 5: ABILITY AND LIQUID FINANCIAL WEALTH OF PRE- AND POST-REFORM INCORPORATED ENTREPRENEURS



Notes: All panels condition on firms created by individuals who were not entrepreneurs in the prior year. Panel A considers the raw cognitive ability scores, measured on a stanine scale (1 through 9), where 5 is calibrated to correspond to an IQ of 100 and a unit difference in the stanine scale corresponds to an IQ difference of 7.5. Panel B considers liquid financial wealth (deposits, stocks, bonds, mutual fund holdings).

### 4.3 Firm-level outcomes

We proceed by examining whether post-2012 incorporated firms differ in terms of financial characteristics, such as size and profitability. We do this by estimating the following regression equation:

$$y_{f,2018} = \alpha_t + \varepsilon_f, \quad (10)$$

where  $y_{f,2018}$  is the outcome variable of interest,  $\alpha_t$  are incorporation-year fixed effects, and  $\varepsilon_f$  is the error term. We drop the year 2018 from our regression to ensure that all firms were active for the entire year that the outcome variable was recorded.

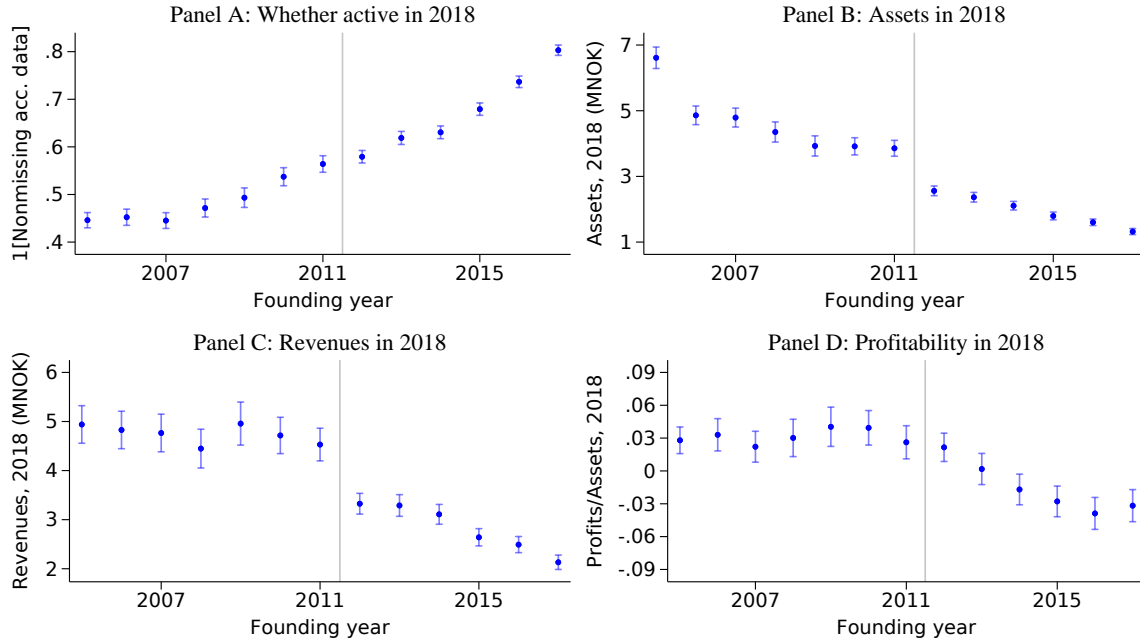
To the extent that post-2012 entrants have lower entrepreneurial ability, we would expect to see that their firms are both smaller and less profitable. We present our findings in Figure 6 which considers different outcomes measured in 2018. Panel A considers whether a firm is active, measured by whether it has nonmissing accounting data in 2018. This reveals no indication of post-2012 firms being less likely to be economically active.

In panel B, we consider the total book assets, and find a sharp difference. Post-2012 firms have about \$200,000 (MNOK 1.25) less assets. This difference is considerably larger than the reduction in the capital requirement from \$17,000 to \$5,000. This indicates that the



reform did only reduce the amount of equity in firms but also other liabilities. To shed some light on the large different in asset size, we plot the 2011 and 2012 distributions of assets in Figure OA.4. This indicates that lowering the capital requirement lead to a large increase in the frequency of firms on the left side of the asset distribution. Figure OA.5 verifies that the size differences occur at incorporation. At the end of the founding year, post-reform firms are about \$80,000 (NOK 500,000) smaller in terms of assets and \$50,000 smaller in terms of revenues. Contrasting these differences with those found for 2018 suggests that the asset size differential slightly shrinks while the revenue gap slightly increases. We decompose and discuss the balance sheet effects in section 5.3.

Figure 6: FIRM OUTCOMES, CONTRASTING PRE- AND POST-REFORM ENTRANTS



Notes: All panels condition on firms incorporated by individuals who were not entrepreneurs in the prior year. Panel A considers whether the firm has nonmissing accounting data in 2018. Panel B considers the total book assets (winsorized at the 95th percentile) and panel C considers the total revenues (also winsorized at the 95th percentile), and panel D considers profitability. Profitability is measured as  $\min(\max(\frac{\text{Operating profits}}{\text{Assets}}, -1), 1)$ . All variables are measured in 2018. Standard errors underlying the 95% confidence bands are clustered at the person (entrepreneur) level.

We also find that marginal firms are smaller in terms of revenues. Panel C exhibits a sharp reduction in revenues for firms incorporated in 2012 and onward. The difference is approximately \$170,000 (NOK 1,000,000). Despite the clear evidence that the marginal firms are smaller, our analysis does not indicate that they are less profitable. Panel D considers profitability (operating income divided by book assets) in 2018, which shows no indication that firms that entered after the capital requirement reduction are less profitable, which is consistent with our findings of no material differences between marginal and average

entrepreneurs in terms of cognitive ability or educational attainment.

One question is whether the lower capital requirements caused increased entry into industries typically populated by smaller firms. To understand whether this is an important mechanism behind our findings, Online Appendix Figure OA.3 repeats the analyses in Figure 6 while including 5-digit NACE industry code fixed effects in the regression equations. This reveals quantitatively similar results.

The purpose of our analyses on firm outcomes is to examine whether lower capital requirement facilitated the entry of different firms and entrepreneurs. However, there is an important caveat in that this selection effect cannot be cleanly identified due to potential treatment effects of the reform. That is, by imposing less binding constraints on the firm’s financing mix (i.e., requiring less equity), some entrepreneurs may be able to optimally choose to commit less personal wealth and thus perform better.<sup>8</sup>

#### 4.4 Entrepreneurial income

We next explore whether there are differences in realized entrepreneurial income, defined as the sum of personal income (salary, dividends, realized capital gains, sole-proprietor income) and allocated retained earnings.<sup>9</sup> To accommodate observations with negative income (e.g., due to large negative profits), we winsorize entrepreneurial income at the bottom 5% level prior to taking logs.

There are at least two reasons for why we might expect that post-reform entrants have lower entrepreneurial incomes. First, if entrepreneurial activities spawned by nonpecuniary motives tend to require less capital, we may expect an increased inflow of non-pecuniarily-motivated entrepreneurs. Second, if new entrants are of lower ability, they may generate less cash flows that they can allocate to themselves either via wages or capital income. We report our findings in Figure 7. While our previous finding that post-reform entrants have lower assets but similar profitability should imply that they earn less profits, we do not see clear evidence of a sharp drop in entrepreneurial income (measured in 2018) for post-reform entrants. There is a downward-sloping trend, which appears somewhat more discontinuous around 2012 for incorporated as opposed to sole-proprietor entrepreneurs. This lack of a sharp change in entrepreneurial incomes may be explained by retained earnings (and thus profits) accounting for a relatively small share of total income and that the salaries entrepreneurs pay themselves are similar across cohorts.<sup>10</sup>

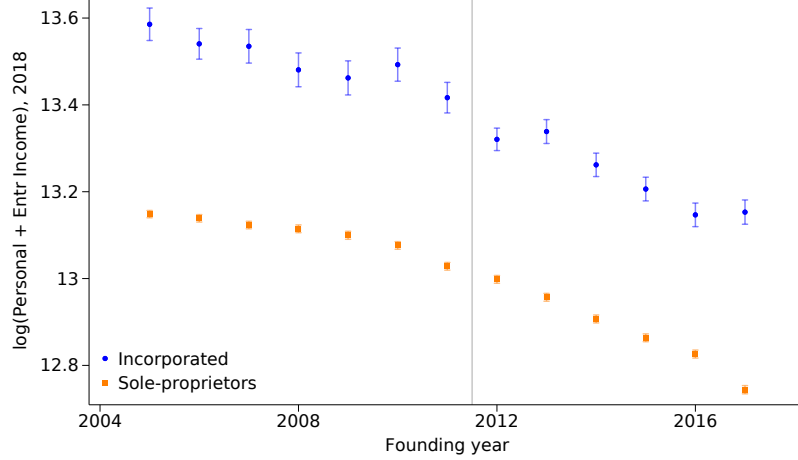
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<sup>8</sup>For example, forcing a risk-averse entrepreneur to put up more equity may cause the entrepreneur to undertake less high-return high-risk projects.

<sup>9</sup>We allocate retained earnings using the entrepreneur’s ownership share, and we allocate earnings from firms in which the individual is the entrepreneur—that is, she is CEO and owns  $\geq 1\%$  of shares)

<sup>10</sup>The mean share of allocated retained earnings relative to total entrepreneurial income is 1.9%, and the 10th and 90th percentiles are -8.8% and 26.4%.

Figure 7: ENTREPRENEUR'S INCOME, CONTRASTING PRE- AND POST-REFORM ENTRANTS



Notes: All panels condition on firms incorporated by individuals who were not entrepreneurs in the prior year. Scatter points come from estimating the following regression equation:  $\log(\text{personal income}_{i,2018} + \text{allocated retained earnings}_{i,2018}) = \alpha_{t,n} + \varepsilon_i$ , where  $t$  indexes firm type  $\in \{\text{incorporated, sole-proprietorship}\}$ . If an individual who starts a firm in  $t$  is no longer an entrepreneur in 2018, the left-hand-side variable only contains personal income as observed in the tax returns. Allocated retained earnings $_{i,2018}$  equal  $\sum_f \text{ownership share}_{i,f,2018} \times (\text{net income}_{f,2018} - \text{dividends}_{f,2018})$ . Standard errors underlying the 95% confidence bands are clustered at the person (entrepreneur) level.

## 5 Estimates on how marginal entrepreneurs are different

The previous section provides our main findings graphically on how post-reform entrants differ from pre-reform entrants. This section maps these pre-post differences into estimates of how marginal entrepreneurs (those who only entered due to the reform) to the existing, average entrepreneur (who would have entered regardless). The underlying assumptions are that (i) the post-reform increase in entrepreneurship rates is entirely caused by the entry of marginal entrepreneurs and (ii) any change in the average characteristic of entrants from before to after the reform is fully attributable to the entry of marginal entrepreneurs.

### 5.1 Empirical framework

**Differences in average traits of post and pre-reform entrants.** We assume that there are two types of entrepreneurs,  $e$ : always entrepreneurs,  $A$ , and marginal entrepreneurs,  $B$ . Post-reform there are  $N_{post} = N_A + N_B$  entrepreneurs and pre-reform there are  $N_A = N_{pre}$ . We only consider *entrants*, not existing entrepreneurs. Pre-reform, the

average characteristic of entrepreneurs is given by

$$\bar{Y}^{pre} = \frac{1}{N_A} \sum_{i \in A} Y_i. \quad (11)$$

Post-reform, the average characteristic is given by

$$\bar{Y}^{post} = \frac{1}{N_A + N_B} \left( \sum_{i \in A} Y_i + \sum_{i \in B} Y_i \right). \quad (12)$$

This implies (see Online Appendix A.1 for a derivation) that

$$\frac{\bar{Y}^{post} - \bar{Y}^{pre}}{\frac{N_{post} - N_{pre}}{N_{post}}} = \frac{1}{N_B} \sum_{i \in B} Y_i - \frac{1}{N_A} \sum_{i \in A} Y_i, \quad (13)$$

which says that the pre versus post-reform difference in means divided by the growth rate of the number of firms (relative to the new total—not the existing one) equals the difference in mean characteristics of the two types of entrepreneurs. Equation (13) can be used the following way. If we find that the pre-post difference in some characteristic is 1, and the number of incorporations go from 2 to 3, then the difference (in means) is  $\frac{1}{1/3} = 3$ .

We estimate the left-hand-side of equation (13) by first estimating the difference in mean characteristics by way of a regression discontinuity design. This RDD approach essentially formalizes the criteria we used in Section 4: we are more comfortable assigning causality if any effects materialize sharply following the reform and do not appear to be driven by time trends.

Our estimate of  $\bar{Y}^{post} - \bar{Y}^{pre}$  is  $\hat{\beta}^Y$  from estimating the regression equation

$$Y_i = \alpha + \beta^Y \mathbb{1}[s \geq 2012] + \gamma^- \times s \times \mathbb{1}[s < 0] + \gamma^+ \times s \times \mathbb{1}[s \geq 0] + \varepsilon_i, \quad (14)$$

where  $Y_i$  is a characteristic measured in year  $h$ , and  $s$  is the founding year, normalized to be zero in 2012. To limit the influence of non-linear long-run time trends, we limit the sample to incorporations done within 3 years of the reform, that is during 2009–2014.

The related estimator for the growth rate,  $\frac{N_{post} - N_{pre}}{N_{post}}$  is simply  $\frac{N_{2012}^Y - N_{2011}^Y}{N_{2012}^Y}$ , where this growth rate is based only on incorporation events for which  $Y$  is observable.<sup>11</sup> The choice of a simple estimator for the increase in entry is due the graphical evidence in Figure 3 that shows no evidence that the 2011–2012 jump was related to overall trends. Hence, we our

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<sup>11</sup>That is, incorporation events that were followed by exits before  $Y_{i,h}$  was measured (e.g., profitability in 2018) do not count toward the growth rate.

estimator is

$$\widehat{\Delta Y}_h = \frac{\hat{\beta}^Y}{\frac{N_{2012}^Y - N_{2011}^Y}{N_{2012}^Y}}, \quad (15)$$

where we obtain standard errors from a 200-repetition bootstrap procedure.

## 5.2 Estimated differences

Table 1 provides our formal estimates from equation (15). Panel A considers ex-ante characteristics of the entrepreneurs. All differences are statistically insignificant, consistent with the graphical evidence in Figure 4. These estimates allow us to rule out that, for example, marginal entrepreneurs have IQs that are more than 0.16 stanine points less than the average entrepreneur.<sup>12</sup> This translates into a an IQ (100 scale) difference of 1.2, which suggests that we have sufficient statistical power to rule out material differences in cognitive ability.

Panel B considers ex-post outcomes. We estimate large differences in proxies for entrepreneurial size: assets, revenues, and the total wage bill of the firm. The marginal entrepreneur creates firms that are about 1.25 MNOK (32%) smaller in terms of assets, 0.96 MNOK (21%) smaller in revenues, and 0.26 MNOK (22%) smaller in terms of labor costs.

The differences in sample size (columns 1 and 6 versus the rest) are driven by data availability (e.g., firm exits cause missing values). Entrepreneurial income is still defined at the person level if the firm no longer exists, in that case we allocate zero retained earnings from the firm. Missing values for entrepreneurial income would arise if the person has no reported personal taxable income (e.g., due to death).

## 5.3 Balance Sheets at incorporation

We find that post-reform firms are considerably smaller than pre-reform firms in terms of assets. Table 2 decomposes this effect by considering different types of assets as well as liabilities in the year of incorporation. Note that  $\widehat{\Delta Y}$ , in this setting, is likely biased, since always-entrepreneurs (who would enter even if no capital requirement reduction) may also be responding to the reform by choosing a more levered capital structure.<sup>13</sup> Hence, we focus our discussion on the simple pre-post reform difference.

Panel A considers the asset side of the balance sheet. We see that pre and post-reform

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<sup>12</sup>0.192-1.96\*0.178

<sup>13</sup>All post-reform entrants may now choose to provide less equity at incorporation. This should lead to an upward bias on the point estimates for the debt components and a negative bias for equity.

Table 1: HOW THE MARGINAL AND AVERAGE ENTREPRENEURS DIFFER

Notes: This table provides estimates of how marginal entrepreneurs differ from average entrepreneurs: The first three rows are the estimated coefficients from equation (14), the fourth row is the growth rate in incorporations in the sample where the outcome variable is observed, the fifth row provides the estimated  $\Delta Y_h$ , which is our main estimate. Panel A considers ex-ante traits of entrepreneurs: total personal income in 2006, age at incorporation, whether a college degree in 2010, and their military-enlistment cognitive ability (1–9 stanine) score. Panel B considers ex-post outcomes measured in 2018. Wages are the total wage bill (labor costs) for the firm. Entrepreneurial income is the sum of personal taxable income (e.g., salaries, capital income, sole-proprietor income) and allocated retained earnings. Standard errors are obtained from a 200-repetition bootstrap procedure.

Panel A: Ex-ante characteristics				
	(1)	(2)	(3)	(4)
	log(Personal Income)	Age	College	IQ ( 1–9 )
$\overline{Y}^{post} - \overline{Y}^{pre}$	-0.037 (0.034)	-0.218 (0.309)	-0.020 (0.015)	0.072 (0.066)
$\frac{N_{2012} - N_{2011}}{N_{2012}}$	0.383*** (0.014)	0.412*** (0.014)	0.392*** (0.015)	0.376*** (0.019)
$\widehat{\Delta Y}$	-0.096 (0.090)	-0.528 (0.751)	-0.052 (0.038)	0.192 (0.178)
N	20567	23414	21239	13174

Panel B: Ex-post outcomes, 2018						
	(1)	(2)	(3)	(4)	(5)	(6)
	Profitability	1[Nonmissing Accounting]	Assets (MNOK)	Revenues (MNOK)	Wage bill (MNOK)	log(Entr Income)
$\mathbb{1}[s \geq 2012]$	0.00 (0.01)	-0.02 (0.01)	-1.25*** (0.19)	-0.96*** (0.28)	-0.26*** (0.07)	-0.07** (0.03)
$\frac{N_{2012} - N_{2011}}{N_{2012}}$	0.43*** (0.02)	0.42*** (0.01)	0.43*** (0.02)	0.43*** (0.02)	0.43*** (0.02)	0.41*** (0.01)
$\widehat{\Delta Y}$	0.00 (0.03)	-0.04 (0.04)	-2.90*** (0.46)	-2.23*** (0.66)	-0.60*** (0.17)	-0.17** (0.07)
N	13739	23798	13877	13877	13877	22898
$\overline{Y}_{2011}$	0.03	0.56	3.86	4.53	1.17	13.42

firms differ on all types of assets. The largest difference is found for property, plant, equipment, and vehicles, which explains 20% of the total difference.

Table 2: THE BALANCE SHEETS OF MARGINAL ENTREPRENEURS AT INCORPORATION

Notes: This table provides estimates of how marginal entrepreneurs differ from average entrepreneurs: The first three rows are the estimated coefficients from equation (14), the fourth row is the growth rate in incorporations in the sample where the outcome variable is observed, the fifth row provides the estimated  $\Delta Y_h$ , which is our main estimate. All variables are measured at the end of the year of incorporation. Intangible assets consists of R&D assets, patents, goodwill and similar. PPEV is plant, property, equipment, and vehicles. REI is real-estate investments, Subsid is equity and debt in subsidiaries or affiliated companies. FA Secur is unlisted and listed securities. AP is accounts payable. CA Secur consists of listed securities. Cash is cash and bank deposits. On the liability side, taxes consist of unpaid VAT and income tax liabilities. Bank/bonds consist of bonds, debt to banks and other traded debt securities. Affil consists of debt to affiliated or parent companies. Standard errors are obtained from a 200-repetition bootstrap procedure. Standard errors are obtained from a 200-repetition bootstrap procedure.

Panel A: Assets in year of incorporation, Million NOK										
	Total	Fixed Assets						Current Assets		
		Intang	PPEV	REI	Subsid	Secur	Other	AP	Secur	Cash
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\mathbb{1}[s \geq 2012]$	-0.60*** (0.08)	-0.03*** (0.01)	-0.12*** (0.04)	-0.06*** (0.02)	-0.06** (0.03)	-0.05*** (0.02)	-0.02 (0.01)	-0.10*** (0.03)	0.00 (0.01)	-0.09*** (0.03)
$\widehat{\Delta Y}$	-1.41*** (0.20)	-0.08*** (0.03)	-0.28*** (0.09)	-0.14*** (0.05)	-0.13** (0.06)	-0.13*** (0.04)	-0.04 (0.03)	-0.25*** (0.07)	0.01 (0.03)	-0.20*** (0.06)
N	20968	20968	20968	20968	20968	20968	20968	20968	20968	20968

Panel A: Liabilities in year of incorporation, Million NOK										
	Total	Equity		Debt						
		Paid-in	Retained	Taxes	Banks/Bonds	Suppliers	Wages	Affil	Other	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
$\mathbb{1}[s \geq 2012]$	-0.60*** (0.08)	-0.11*** (0.03)	-0.04 (0.03)	-0.03*** (0.01)	-0.18*** (0.00)	-0.06*** (0.02)	-0.01** (0.03)	-0.06*** (0.02)	-0.12*** (0.03)	
$\widehat{\Delta Y}$	-1.41*** (0.20)	-0.27*** (0.06)	-0.08 (0.06)	-0.06*** (0.02)	-0.43*** (0.08)	-0.15*** (0.06)	-0.02** (0.01)	-0.15*** (0.05)	-0.29*** (0.08)	
N	20968	20968	20968	20968	20968	20968	20968			

Panel B considers the liability side of the balance sheet. Here, we find that post-reform entrants have \$18,000 (NOK 110,000) less in paid in capital (PIC). Where the 95% confidence interval contains the statutory change of \$9,000. Interestingly, we also find that post-reform entrants have about \$30,000 less in financial debt (banks, bonds, etc). Dividing the difference in financial debt by the difference in PIC gives a sizable multiplier of 1.7.<sup>14</sup>

<sup>14</sup>Note that this multiplier is likely downward biased. This is due to the fact that many “always-entrepreneurs” may have wanted to choose a higher debt to equity ratio before 2012 but were only able to after the equity requirement was lowered in 2012.

Column (8) of Panel B provides differences in debt to affiliated parties (such as firms in the same conglomerate or equity holders). Here, we would have hypothesized a *positive* difference. This is due to the fact that owners (either directly or via intermediate companies) have, following the reform, more room to substitute equity for debt financing, which is more liquid. In principle, the entire reduction in PIC could have been driven by owners financing their firms with more debt instead of equity, but this is not what we find.

In Appendix Table [OA.1](#), we consider the differences as of 2018 and find roughly similar patterns, although here revenue-dependent assets such as accounts payable are more important.

## 6 Discussion

We provide new evidence on how selection into entrepreneurship is affected by a reform that lowered the financial requirements to incorporate. We show that new entrepreneurs were not different in terms of past income, cognitive ability, or education levels. While they do create smaller firms, these firms are not less profitable or less likely to be economically active several years later. Overall, our findings are consistent with a simple model in which marginal entrepreneurs are constrained by their finances and not their ability or outside options. In such a model, policies that reduce financial requirements to enter into entrepreneurship do not lead to a reduction in average entrepreneurial ability.

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## A Online Appendix

### A.1 Derivations for empirical specification

$$\frac{1}{N_B} \sum_{i \in B} Y_i - \frac{1}{N_A} \sum_{i \in A} Y_i = \frac{1}{N_B} \left( \bar{Y}^{post} (N_A + N_B) - N_A \bar{Y}^{pre} \right) - \frac{1}{N_A} \sum_{i \in A} Y_i \quad (16)$$

$$= \frac{N_A}{N_B} \left( \bar{Y}^{post} \frac{N_A + N_B}{N_A} - \bar{Y}^{pre} \right) - \bar{Y}^{pre} \quad (17)$$

$$= \frac{N_A}{N_B} \left( \bar{Y}^{post} \frac{N_A + N_B}{N_A} - \bar{Y}^{pre} \left[ 1 + \frac{N_B}{N_A} \right] \right) \quad (18)$$

$$= \frac{N_A}{N_B} \left( \bar{Y}^{post} \frac{N_A + N_B}{N_A} - \bar{Y}^{pre} \left[ \frac{N_A + N_B}{N_A} \right] \right) \quad (19)$$

$$= \frac{N_A}{N_B} \left( \bar{Y}^{post} - \bar{Y}^{pre} \right) \frac{N_A + N_B}{N_A} \quad (20)$$

$$= \frac{\bar{Y}^{post} - \bar{Y}^{pre}}{\frac{N_B}{N_A + N_B}} \quad (21)$$

$$= \frac{\bar{Y}^{post} - \bar{Y}^{pre}}{\frac{N_{post} - N_{pre}}{N_{post}}} \quad (22)$$

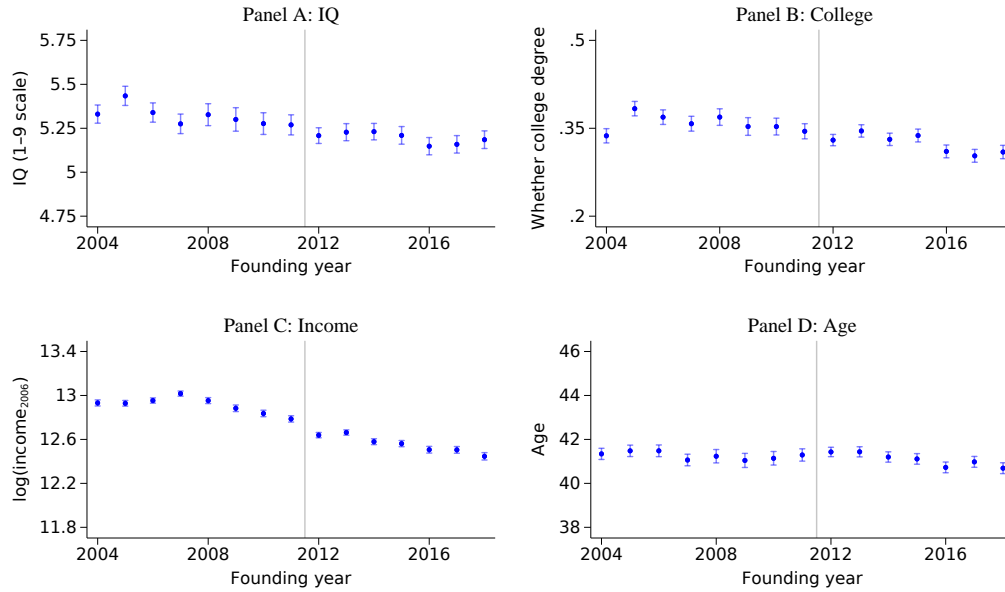
## A.2 Supplementary figures

Figure OA.1: FIRM CREATION BEFORE AND AFTER THE REFORM:  
EXCLUDING ANY ENTREPRENEUR WHO OWNED PRIVATE EQUITY



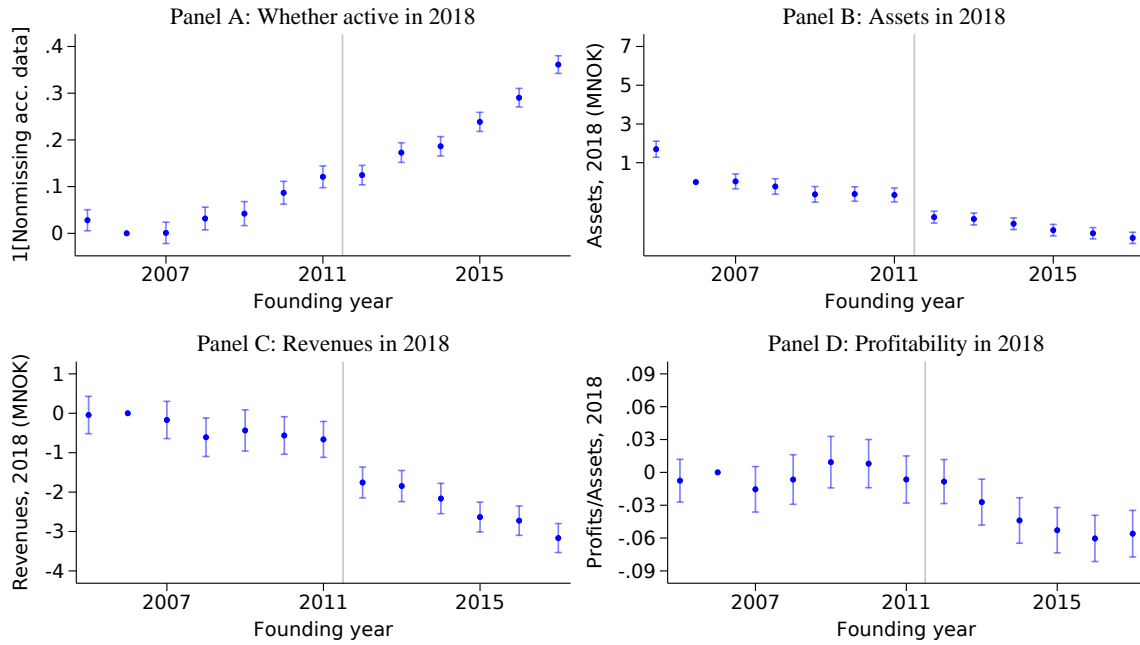
Notes: The solid blue line considers only incorporations done by individuals who were not previously entrepreneurs: neither incorporated (AS), sole-proprietor (ENK), CEO-partner of a partnership (ANS, DA), or CEO of a foreign-incorporated firm (NUF). The dashed orange line restricts the sample to incorporations done by individuals who were not entrepreneurs *nor did they own*  $\geq 1\%$  of the shares in any limited liability firm (AS).

Figure OA.2: CHARACTERISTICS OF ENTREPRENEURS WHO TRANSITION FROM  
SOLE-PROPRIETOR TO INCORPORATED ENTREPRENEURSHIP



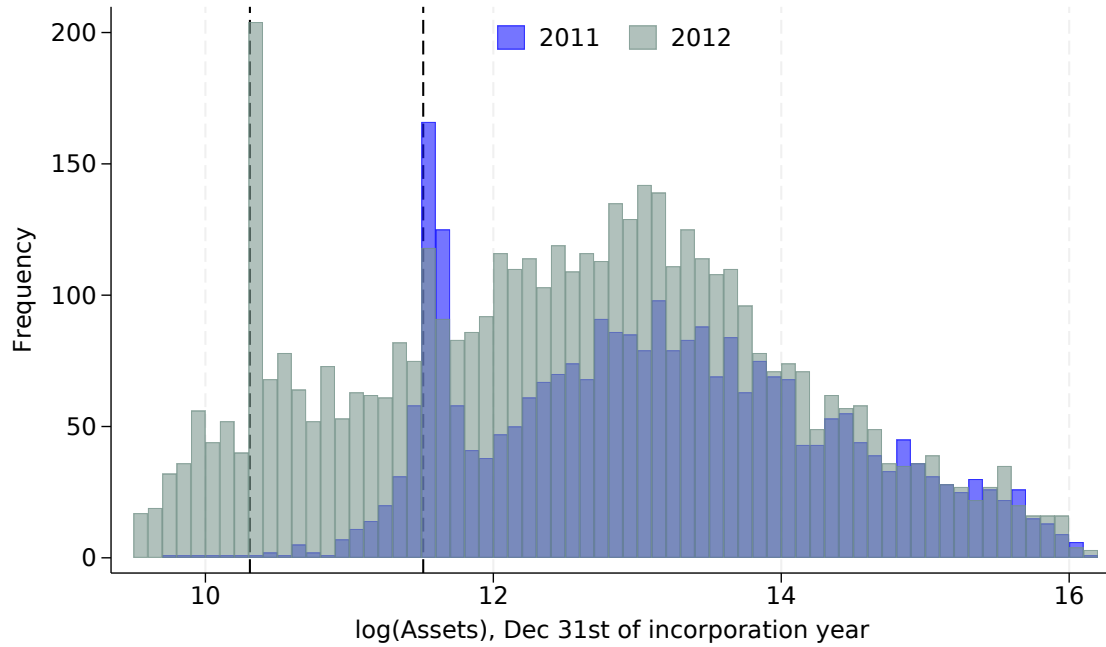
Notes: All panels condition on firms created by individuals who were sole-proprietors but otherwise not entrepreneurs in the previous year. Panel A considers cognitive ability measured on a stanine scale (1 through 9), where 5 is calibrated to correspond to an IQ of 100 and a unit difference in the stanine scale corresponds to an IQ difference of 7.5. Panel B considers a dummy for whether an individual has obtained at least a college degree as of 2010. Income is total taxable personal income measured in 2006 Panel D considers the age of the entrepreneur. Standard errors underlying the 95% confidence bands are clustered at the person (entrepreneur) level.

Figure OA.3: FIRM OUTCOMES, CONTRASTING PRE- AND POST-REFORM ENTRANTS WHILE CONTROLLING FOR INDUSTRY FIXED EFFECTS.



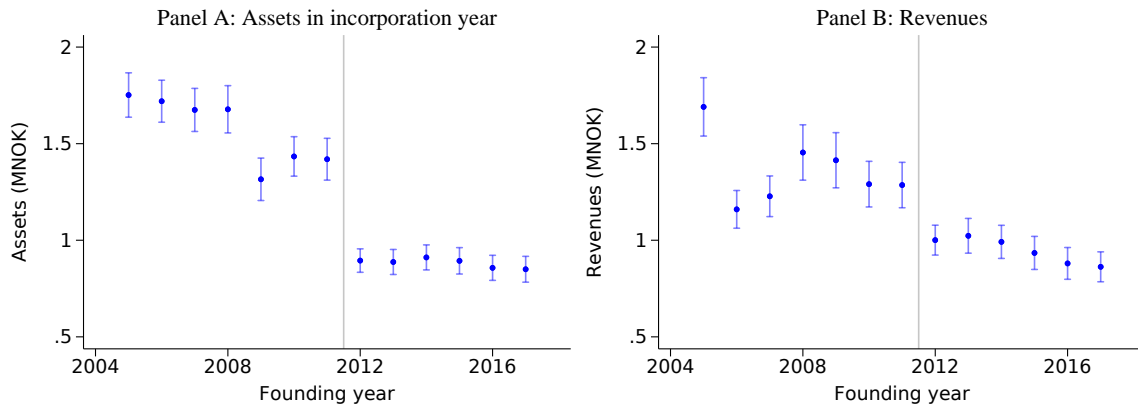
Notes: In contrast to Figure 6, the following regression estimates are the result of also controlling for the incorporated firms' 5-digit NACE industry codes. All panels condition on firms incorporated by individuals who were not entrepreneurs in the prior year. All variables are measured in 2018. Standard errors underlying the 95% confidence bands are clustered at the person (entrepreneur) level.

Figure OA.4: DISTRIBUTION OF ASSETS AT INCORPORATION BEFORE AND AFTER THE REFORM



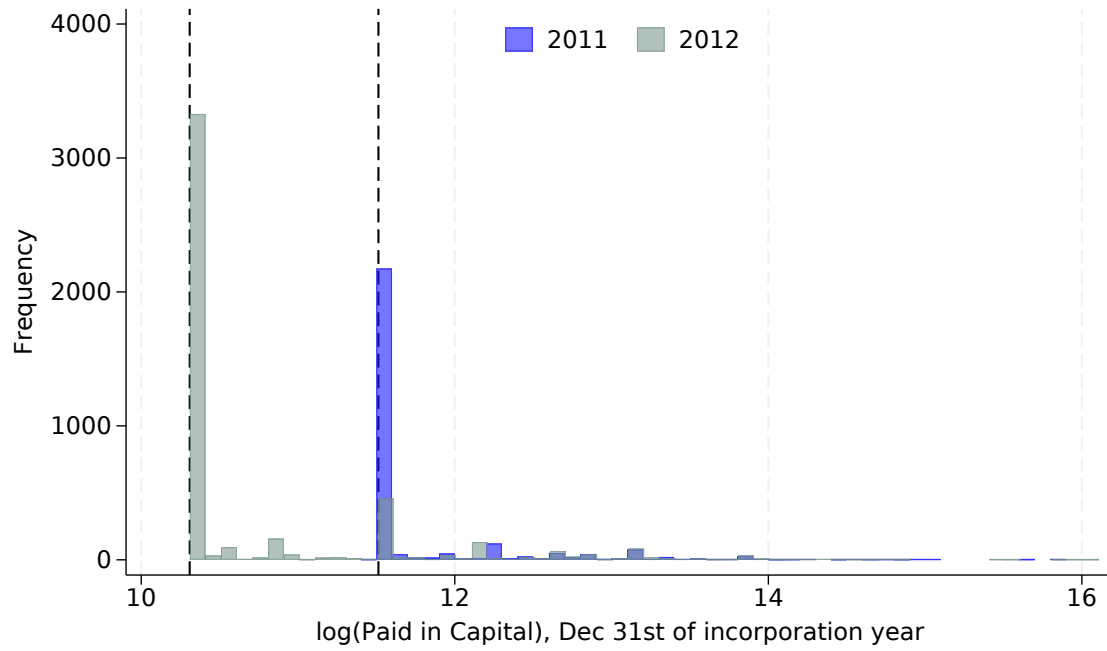
Notes: We plot the distribution of (log) total assets for 2011 and 2012, truncated to restrict the x-axis. The vertical lines indicate the capital requirements for 2012 and 2011, respectively. Note that it is possible to have less assets than (paid-in-capital) equity in the incorporation year, due to, e.g., negative retained earnings. The 2011 mean of  $\log(\text{Assets})$  is 13.24 and the mean for 2012 is 12.49.

Figure OA.5: ASSETS AND REVENUES RIGHT AFTER INCORPORATION



Notes: This figure plots how assets and revenues, measured at the end of the incorporation year, varies with the incorporation year.

Figure OA.6: DISTRIBUTION OF EQUITY (PAID-IN-CAPITAL) BEFORE AND AFTER REFORM



Notes: We plot the distribution of (log) Paid-in-Capital for 2011 and 2012, truncated to restrict the x-axis. The vertical lines indicate the capital requirements for 2012 and 2011, respectively.



Table OA.1: THE BALANCE SHEETS OF MARGINAL ENTREPRENEURS IN 2018

Notes: This table provides estimates of how marginal entrepreneurs differ from average entrepreneurs: The first three rows are the estimated coefficients from equation (14), the fourth row is the growth rate in incorporations in the sample where the outcome variable is observed, the fifth row provides the estimated  $\Delta Y_h$ , which is our main estimate. Intangible assets consists of R&D assets, patents, goodwill and similar. PPEV is plant, property, equipment, and vehicles. REI is real-estate investments, Subsid is equity and debt in subsidiaries or affiliated companies. FA Secur is unlisted and listed securities. AP is accounts payable. CA Secur consists of listed securities (e.g., listed stocks, bonds). Cash is cash and bank deposits. On the liability side, taxes consist of unpaid VAT and income tax liabilities. Bank/bonds consist of bonds, debt to banks and other traded debt securities. Affil consists of debt to affiliated or parent companies. Standard errors are obtained from a 200-repetition bootstrap procedure.

Panel A: Assets in 2018, Million NOK										
	Total	Fixed Assets						Current Assets		
		Intang	PPEV	REI	Subsid	Secur	Other	AP	Secur	Cash
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\mathbb{1}[s \geq 2012]$	-1.25*** (0.19)	-0.00 (0.02)	-0.17** (0.08)	-0.17*** (0.06)	-0.17** (0.08)	-0.14*** (0.04)	-0.03 (0.03)	-0.24*** (0.08)	-0.04 (0.05)	-0.17*** (0.06)
$\widehat{\Delta Y}$	-2.90*** (0.46)	-0.00 (0.05)	-0.40** (0.18)	-0.39*** (0.13)	-0.40** (0.19)	-0.32*** (0.10)	-0.07 (0.07)	-0.57*** (0.18)	-0.10 (0.11)	-0.40*** (0.13)
N	13877	13877	13877	13877	13877	13877	13877	13877	13877	13877

Panel A: Liabilities in 2018, Million NOK										
	Total	Equity			Debt					
		Paid-in	Retained	Taxes	Bank/bonds	Suppliers	Wages	Affil	Other	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
$\mathbb{1}[s \geq 2012]$	-1.25*** (0.19)	-0.15*** (0.05)	-0.47*** (0.10)	-0.08*** (0.02)	-0.25*** (0.07)	-0.09** (0.05)	-0.04*** (0.02)	-0.16*** (0.04)	-0.05 (0.06)	
$\widehat{\Delta Y}$	-2.90*** (0.46)	-0.34*** (0.12)	-1.08*** (0.23)	-0.19*** (0.06)	-0.58*** (0.17)	-0.22** (0.11)	-0.10*** (0.04)	-0.36*** (0.09)	-0.12 (0.14)	
N	13877	13877	13877	13877	13877	13877	13877	13877	13877	