Who gets to experiment with entrepreneurship? Long-term earnings consequences of self-employment^{*}

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Abstract

I propose a theory to reconcile contrasting predictions on the long-term earnings consequences of entrepreneurship. One stream of extant research contends that entrepreneurs hold the option value of returning to paid employment if they do not do well. The other argues they suffer a penalty when applying for jobs. This paper highlights future employers' commitment costs and the ease of venture growth as key mechanisms governing returns. They vary across types of entrepreneurs and human capital. Using high-frequency survey data from India, I find that necessity entrepreneurship increases short-term earnings through more continuous employment compared to alternatives. Among opportunity entrepreneurs, low human capital workers achieve higher and more stable earnings while self-employed. Employers can also hire them with little commitment, facilitating frictionless returns to paid work. High human capital entrepreneurs, on the other hand, face an institutional environment that makes building a growth startup costly and they struggle to return to salaried employment. This paper emphasizes the role of labor market mechanisms in governing longterm returns to entrepreneurship and extends theory to encompass the most common types of global entrepreneurship.

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Introduction

At some point in their careers, many people face the question of whether entrepreneurship presents a favorable pathway forward compared to paid employment alternatives (Burton, Sørensen, and Dobrev, 2016; Rider, Thompson, Kacperczyk, and Tåg, 2019; Sørensen and Sharkey, 2014). In the United States, around 35% of people ever experience a spell in self-employment (Hincapié, 2020). Globally, the number is much higher (ILO, 2021). However, most businesses fail: exit rates from self-employment are high and entrepreneurial spells tend to be short, both in the US and across the globe (BLS, 2021; Donovan, Lu, and Schoellman, 2023; Manso, 2016). I ask: What are the long term earnings consequences of self-employment for different types of entrepreneurs?

The emergent research assessing consequences of self-employment offers diverging predictions. On the one hand, work exploring how former founders fare upon returning to the labor market indicates a penalty as employers struggle to evaluate entrepreneurial experience and perceive them to lack commitment and fit (Botelho and Chang, 2023; Kacperczyk and Younkin, 2022; Mahieu, Melillo, Reichstein, and Thompson, 2021). Experimental evidence demonstrates that former entrepreneurs are less likely to be invited for a job interview in the US (Botelho and Chang, 2023; Kacperczyk and Younkin, 2022). While Mahieu, Melillo, and Thompson (2022) also find a long-term earnings penalty for former founders in Belgium, evidence from Denmark does not support adverse effects (Merida and Rocha, 2021). These studies do not consider earnings in entrepreneurship. If there is negative selection out of self-employment, they might overstate adverse consequences of becoming an entrepreneur.

An alternative perspective incorporates both earnings from entrepreneurship and from subsequent work in paid employment. Papers in this stream consistently find an earnings boost for those attempting entrepreneurship (Catherine, 2022; Dillon and Stanton, 2017; Manso, 2016). In contrast to the Belgian findings, Manso (2016) argues that entrepreneurs hold an option to return to paid employment and finds that those who do not remain selfemployed for a long-time only experience a transitory, short-term earnings penalty. Yet, experiences in entrepreneurship vary substantively for different types of entrepreneurs (Botelho, Fehder, and Hochberg, 2021; Rider et al., 2019). Prior research on the long-term consequences of entrepreneurship has spent little time distinguishing between these. It has either pooled all the self-employed (e.g. Mahieu et al., 2022; Manso, 2016) or focused on highly educated entrepreneurs who start businesses with growth potential (e.g. Botelho, Fehder, and Miric, 2023; Catherine, 2022). Motivations for entrepreneurial entry vary, even among those starting small businesses with little potential for growth (Hurst and Pugsley, 2011).

While the literature suggests a myriad of ways of identifying entrepreneurial sub-types (e.g Botelho et al., 2021), I focus on two dimensions: the opportunity-necessity divide and the human capital of the entrepreneur. Necessity entrepreneurs enter because they do not have other options. If not for self-employment, they might be unemployed (Nikiforou, Dencker, and Gruber, 2019; O'Donnell, Leger, O'Gorman, and Clinton, 2023). Others identify an opportunity they can exploit (Barach and Rider, 2023). Among opportunity entrepreneurs, I distinguish between those high- and low in human capital. Low human capital entrepreneurs start businesses with little growth potential (Botelho et al., 2021; Levine and Rubinstein, 2017). In emerging economies, they face precarious alternatives in paid employment (Borchhardt and Sorenson, 2022; ILO, 2016). But unlike necessity entrepreneurs, they can time their entry and fill local market gaps.¹ When high human capital entrepreneurs leave stable employment, they often leverage their expertise to start businesses that can grow large (Botelho et al., 2021; Brüderl, Preisendörfer, and Ziegler, 1992).

These groups differ significantly in the stability of their alternative employment options, their expected returns from entrepreneurship, and the penalties they might face if returning to paid employment. For necessity entrepreneurs, the operating mechanism is finding *any* employment. If alternative employment options are limited, any earnings from entrepreneurship are an improvement. Whether the option value view predicting positive returns or

¹Where to draw the line between necessity and opportunity entrepreneurs can be contentious (e.g. O'Donnell et al., 2023). My distinction of entrepreneurial sub-types focuses on the immediate need as well as opportunity structures individuals face. By categorizing a smaller subset as necessity entrepreneurs, I heed calls to not group disparate populations under the necessity umbrella (O'Donnell et al., 2023).

the commitment penalty view predicting negative returns holds out among opportunity entrepreneurs remains an open question.

I argue that the human capital of the entrepreneur and the segment of the labor market in which they compete for jobs help reconcile diverging findings in prior work. Entrepreneurs with low human capital can reap large returns in entrepreneurship. When engaging in paid employment, they often work short-term, precarious jobs. For employers there are little costs of committing to a worker. They can quickly fire and replace employees. Low human capital entrepreneurs can thus experiment with entrepreneurship and return to a labor market in which questions about performance and commitment matter little. They can even try to start a new business if the first one fails. High human capital entrepreneurs face uncertain returns from entrepreneurship and strong penalties if they return to rigid labor markets. Their earnings in entrepreneurship are dependent on an institutional environment that fosters venture growth. Upon exiting entrepreneurship, they compete for jobs with high commitment costs — positions entailing lengthy hiring processes, for which workers are costly to replace.

I explore these patterns by examining the long-term returns to self-employment in India. India encompasses the extremes of the entrepreneurship spectrum and is thus well-suited to test my theory. It also highlights an often underutilized context in entrepreneurship and management research. Over 50% of its working population engage in self-employment, mainly in subsistence entrepreneurship (Sundar, 2011). Yet, at the other end of the spectrum exists a thriving entrepreneurial ecosystem that includes high-tech startups and venture capital (Claes and Vissa, 2020; Hans and Vissa, 2023). If contrasting findings from prior work stem from mechanisms operating differently depending on human capital and employer hiring costs, India should cover the spectrum. The context also helps extend prior work to subsistence and necessity entrepreneurs. I use large-scale survey data from 2016-2023 with three waves per year. Data availability has previously limited the study of (longitudinal) entrepreneurial returns to wealthier countries. The frequency of these survey data allow me to identify (i) the persistence of earnings trends (e.g. whether they wax or wane over time) and (ii) when an entrepreneurial spell begins and ends in a setting in which people repeatedly switch between paid and self-employment and spells can be short (Donovan et al., 2023).

I create a matched sample with comparable earnings and employment histories and document a large, persistent earnings premium for those attempting self-employment, in the aggregate. Following prior work, I differentiate between necessity and opportunity entrepreneurs based on their prior (un-)employment. Prior work in salaried employment (vs casual work) and education distinguish low and high human capital entrepreneurs.

Necessity entrepreneurs experience a larger initial earnings premium than opportunity entrepreneurs. The earnings premium for necessity entrepreneurs is most pronounced in the short run and predominantly driven by avoiding unemployment. Part of the effect is driven by necessity entrepreneurs looking for work at higher rates than similar others, but the earnings premium remains large when accounting for out-of-the-labor-force unemployment. Most of the benefits for necessity entrepreneurs accrue within the spell itself - after exiting, necessity entrepreneurs largely return to their prior earnings trajectory.

Opportunity entrepreneurs with low human capital reap consistent positive returns, while high human capital entrepreneurs suffer a discount from which they are slow to recover. Findings are consistent with commitment costs for employers and costs of venture growth governing earnings patterns. For low human capital entrepreneurs, low commitment costs engender frictionless returns to paid employment; they face little downside risk. High human capital entrepreneurs, however, struggle to return to salaried work. Heterogeneity in labor regimes further supports these interpretations. Labor laws increasing employment protections and the costs of hiring, and thereby commitment costs, decrease the earnings premium for low human capital entrepreneurs. Business regulations governing formalization procedures and mandated benefits for employees highlight another driver reducing earnings for high human capital entrepreneurs: the cost of venture growth.

This paper makes several contributions. First, it builds a theory around how the consequences of experimenting with entrepreneurship vary across types of entrepreneurs. Penal-

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ties observed in prior research from Western countries only apply to high human capital entrepreneurs in India — those engaging in segments of the labor market in which commitment costs for employers are high. Others can experiment with little punishment. Crucially, the paper highlights the role of the commitment cost for employers and the cost of venture growth as key mechanisms. Second, this paper brings necessity entrepreneurs into the research stream on long-term returns to entrepreneurship. It directly estimates the returns to necessity entrepreneurship rather than focusing on the comparison to opportunity entrepreneurship, which may hold policy relevance but is of little help to individuals contemplating entry. Third, I extend studies of long-term earnings consequences of entrepreneurship to India, an emerging economy in which many more are self-employed. Data availability has limited prior research in this stream to wealthy contexts. Most directly, findings of this study apply to a much larger proportion of entrepreneurs globally.

The (long-term) returns to entrepreneurship

Most early research on the returns to entrepreneurship uses cross-sectional data from Western countries showing the median person in self-employment to earn less than the average employee. Yet, the entrepreneurial earnings distribution has a thick right tail populated by a select few who reap disproportionately large returns (Hamilton, 2000; Moskowitz and Vissing-Jørgensen, 2002). This earnings premium accrues primarily to those who start businesses with the potential for growth: the highly educated and those starting incorporated businesses (Levine and Rubinstein, 2017; Sorgner, Fritsch, and Kritikos, 2017; Van Praag, van Witteloostuijn, and van der Sluis, 2013).

Two related streams of research investigate the long-term consequences of self-employment. The first argues that viewing spells in self-employment as a form of experimentation can explain the negative average returns to entrepreneurship (Manso, 2016). Entrepreneurs can learn about their entrepreneurial ability and test the potential of their ideas. If they do not succeed, they can return to paid employment, minimizing downside risk. Empirically, these papers estimate the returns to *attempting* entrepreneurship, including future earnings both in entrepreneurship and in paid employment. In contrast to cross-sectional analyses, these studies consistently report positive long-term returns to experimenting with entrepreneurship (Catherine, 2022; Daly, 2015; Dillon and Stanton, 2017; Manso, 2016)

The second stream studies what happens to former entrepreneurs *after* their spell ends and paints a gloomier, albeit mixed, picture. Most studies find that former entrepreneurs earn less in their first job back than their counterparts who remained in paid employment (Baptista, Lima, and Preto, 2012; Kaiser and Malchow-Møller, 2011; Mahieu et al., 2021). In Belgium, this earnings penalty persists in the long-run (Baptista et al., 2012; Mahieu et al., 2022). However, exceptions exist both in the short-run (Luzzi and Sasson, 2016) and long-run (Merida and Rocha, 2021).

Given the different populations of entrepreneurs underlying these studies, divergent findings may stem from different mechanisms operating across types of entrepreneurs. Earlier work shows entrepreneurs building growth oriented organizations differ substantively from others (Levine and Rubinstein, 2017; Sorgner et al., 2017). We might expect their long-term returns to differ too. More positive (less negative) long-term returns among those who enter entrepreneurship early in their career already suggest substantial long-run variation (Mahieu et al., 2022; Merida and Rocha, 2021). However, other mechanisms driving differences in returns across groups of entrepreneurs remain unclear.²

Types of entrepreneurship and career trajectories

Prior work has identified several sub-groups of the self-employed and, at times, debated which constitute entrepreneurship (see, e.g., a recent overview by Botelho et al., 2021). Many of these are distinguished by the growth potential of the business, which identifies

²Merida and Rocha (2021) find little difference between the incorporated and unincorporated. However, their sample is limited to university graduates, so this distinction might not map onto the divide captured by Levine and Rubinstein (2017) among all the self-employed.

those aiming to employ others and bring innovations to market (Botelho et al., 2021; Schoar, 2010). Globally, the vast majority of entrepreneurs grow little or not at all (Schoar, 2010).

For the purpose of this study, I focus on entrepreneurship as a status distinct from paid employment (cf. Sørensen and Sharkey, 2014). My aim is to understand the career-consequences of the choice to be responsible for one's own income (Burton et al., 2016). I, therefore, treat entrepreneurship and self-employment as synonymous. Instead of focusing solely on growth potential, understanding theoretical mechanisms demands identifying antecedents and sources of variation that define the alternative options for potential entrepreneurs (Gimeno, Folta, Cooper, and Woo, 1997).

While any approach of grouping the self-employed fails to capture all nuances, the distinction between opportunity- and necessity entrepreneurs is critical to understanding the mechanisms governing their careers and earnings trajectories (George, Kotha, Parikh, Alnuaimi, and Bahaj, 2016; Nikiforou et al., 2019). The former enter self-employment when an opportunity arises for which they are willing to forego the stability of paid employment. Much prior theory about entrepreneurial careers, sometimes implicitly, focuses on this group (e.g., Carnahan, Agarwal, and Campbell, 2012; Sørensen and Sharkey, 2014). Necessity entrepreneurs enter when forced, lacking options. They solve finding *any* employment rather than facing unemployment, especially in emerging markets with little in the form of institutional support or welfare nets (Dencker, Bacq, Gruber, and Haas, 2021; O'Donnell et al., 2023). My definition of necessity entrepreneurs thus differs from broader ones capturing all who enter low-growth entrepreneurship for economic reasons (O'Donnell et al., 2023).

Among opportunity entrepreneurs, mechanisms vary by human capital. High human capital entrepreneurs start growth businesses, often with uncertain prospects (Botelho et al., 2021). When not self-employed, they work stable, salaried jobs with high earnings and advancement opportunities (Gimeno et al., 1997). Lower human capital entrepreneurs often start businesses with little to no growth potential. They may enter for non-pecuniary reasons or be constrained by their environment to engage in subsistence entrepreneurship (Hurst and Pugsley, 2011; Schoar, 2010). They are less educated and their alternative options in paid employment tend to be less stable, particularly in emerging economies, and offer few opportunities for advancement (Donovan et al., 2023). Unlike necessity entrepreneurs, opportunity entrepreneurs with low human capital can weigh alternative employment options. They can spot and fill missing market gaps, such as opening a tea stand where none exists. Their relatively stable income history also allows deliberate planning and accumulation of capital through savings or small loans to fund ventures requiring small upfront investments.³

The returns to necessity entrepreneurship

For necessity entrepreneurs, particularly in emerging economies, the instability of alternative employment opportunities dominates other mechanisms. Hourly wages and advancement opportunities become secondary concerns when finding *any* employment proves difficult. In countries in which marginal employment in casual- or daily wage work is prevalent, many struggle to find continuous employment (ILO, 2016). Employment arrangements are short and lack formal protection (Valenzuela, 2003). People frequently do not know what work they are going to find in a given day, week, or month. They might wait outside factories or seek seasonal farm work. Unemployment can force even those with higher levels of education into precarious work. Benefits and welfare nets are limited, frequently not reaching those most in need (ILO, 2016).

In comparison, self-employment offers an opportunity to control how much to work. It is obviously preferable over unemployment. But it can also provide advantages over precarious alternatives in casual employment (Borchhardt and Sorenson, 2022). Daily wage work only guarantees short-term employment. In self-employment, a person can decide how much to work and produce. Unemployment should be less likely, smoothing earnings instability. If increased earnings from working more hours exceed hourly wage rates in paid employment,

³Some prior work categorizes these low human capital entrepreneurs as necessity entrepreneurs as well, which has elicited criticism regarding the validity and usefulness of the construct (O'Donnell et al., 2023). My definition avoids these pitfalls by focusing on the acute need and motivation for entry as well as alternative employment opportunities.

necessity entrepreneurs may report higher earnings than those entering precarious work.

Whether, and how long, the advantages provided by more stable employment might last, remains an open question. Some experiments suggest ultra-poor entrepreneurs reap earnings premiums that allow them to transition into better work over time (Balboni, Bandiera, Burgess, Ghatak, and Heil, 2021; Banerjee, Duflo, and Sharma, 2021). But these studies are restricted to the ultra-poor and treated units were provided the initial asset which allowed them to enter entrepreneurship. Outside of these experiments, even the small costs of low-growth entrepreneurship can loom large for those from the most precarious segments of the labor market. Initial returns have to cover operating costs. And necessity entrepreneurs do not have the luxury to wait until they discover a well-suited opportunity. They are pushed to start a business quickly, even if it does not fill a market gap or lies outside of their expertise (Nikiforou et al., 2019), suggesting shorter venture survival (O'Donnell et al., 2023). Frequent short-run transitions between daily wage work, unemployment, and self-employment, which do not result in meaningful career advancement, further question the ability of necessity entrepreneurs to maintain a long-term earnings premium (Donovan et al., 2023).

Yet, demand-side mechanisms, such as employers evaluating former founders more negatively, are unlikely to affect post-entrepreneurship earnings, given the instability of alternatives. Those who find paid employment instead, tend to work precarious jobs that offer little stability and only temporary employment (Borchhardt and Sorenson, 2022; Donovan et al., 2023). The alternative to necessity entrepreneurship is thus unlikely to present a clearly favorable background for potential employers, implying little downside to self-employment entry. Taken together, long-term earnings consequences of necessity entrepreneurship should thus be positive but sensitive to the proportion of entrepreneurs remaining in business.

The option value of opportunity entrepreneurship

Opportunity entrepreneurs have more stable histories of employment and tend to enter entrepreneurship having alternative employment options available to them. Do we, therefore, expect them to be able to experiment with entrepreneurship with little cost, maintaining the option value of returning to paid employment if things do not go well (Manso, 2016)? Or do concerns about commitment and performance preclude them from finding good work in paid employment (Botelho and Chang, 2023; Mahieu et al., 2021; Rider et al., 2019)?

The answer depends on the human capital of the entrepreneur and the segment of the labor market in which they compete. A worker's human capital consists of their education and work experience through which they develop, and signal, skills and knowledge (Brüderl et al., 1992; Gimeno et al., 1997).⁴ To understand the long-term returns to entrepreneurship, conceive of them as a function of the probability of business success and survival, earnings during entrepreneurship, and post-entrepreneurship earnings. Each part of the equation differs by the human capital of the potential entrepreneur.

Low human capital entrepreneurs. Much of the evidence suggesting positive returns for necessity entrepreneurs applies to low human capital entrepreneurs as well. Self-employment can help access continuous employment in light of precarious alternatives (Borchhardt and Sorenson, 2022). Many sell necessity goods with constant demand (Banerjee and Duflo, 2007). And some of the ultra-poor can reap long-term earnings premiums, in part by transitioning into other work over time (Balboni et al., 2021; Banerjee et al., 2021).

Unlike necessity entrepreneurs, opportunity entrepreneurs with low human capital are not forced to enter entrepreneurship. They can wait until they discover a market gap to exploit (Barach and Rider, 2023). They can plan ahead and amass small savings or apply for loans. This should allow them to start more profitable ventures or give them more time to get the business of the ground (cf. Nikiforou et al., 2019). In contrast to necessity entrepreneurs, they should thus be more likely to succeed, and survive for longer, in line with findings from Western countries indicating a positive relationship between opportunity-motivations and

⁴The literature distinguishes between general and specific human capital. The latter can be specific to a firm or industry. The arguments in this paper largely have *general* human capital in mind, as there is little variance in firm-specific skills among subsistence entrepreneurs. However, as firm-specific skills predict the transition into entrepreneurship, it seems likely that long-term returns would vary along similar lines (Sørensen and Sharkey, 2014).

venture survival (Caliendo and Kritikos, 2019).

Whether self-employment represents a favorable path forward in the long-run thus depends on if low human capital entrepreneurs experience a penalty upon returning to paid employment. Commitment costs for employers hiring casual workers are low. Workers are employed on short-term bases if formal contracts exist at all (Sundar, 2011; Valenzuela, 2003). Mistakes of low human capital workers tend to be less costly and they are more easily replaced (Mahieu et al., 2021). While we would continue to expect uncertainty about performance or commitment to induce a penalty, even among workers with low levels of human capital, in countries like Belgium where worker protections are strong (Mahieu et al., 2022), they should become weaker in the US where workers are more easily hired and fired, and virtually disappear in labor market segments of emerging economies that are characterized by casual labor and few enforced labor protection laws.⁵ In these labor markets, protections are weaker, hiring is quicker, and firing easier (ILO, 2016). As commitment costs decrease, so should employers' concerns about commitment and fit. Given short hiring processes, uncertainty about the quality of experience applies equally to paid- and self-employment. Penalties for prior entrepreneurial experience should thus be minimal.

Taken together, positive returns in self-employment, selective entry into businesses with the potential to survive, and low penalties upon returning to paid employment should thus translate into positive long-term earnings for those attempting low human capital entrepreneurship. Their increased survival chances should manifest in more stable returns compared to their necessity counterparts.

Low costs of exit open up another pathway through which low human capital entrepreneurs can reap a lasting earnings premium: repeat entrepreneurship. Prior work shows that entrepreneurs who have previously started a business fare better than their first-time counter-

⁵In line with this, prior work that has not documented long term penalties from entrepreneurship stems from the US and Denmark (Daly, 2015; Dillon and Stanton, 2017; Manso, 2016; Merida and Rocha, 2021). Both countries are characterized by flexible labor markets in which commitment concerns might be reduced by employers' ability to hire and fire employees quickly. In Portugal and Belgium, where employment protections are stronger, there are more persistent penalties (Baptista et al., 2012; Mahieu et al., 2022).

parts. Explanations contrast selection (Chen, 2013; Gompers, Kovner, Lerner, and Scharfstein, 2010) and learning (Eesley and Roberts, 2012; Parker, 2013). But when costs of failure are low, a simpler explanation suffices: Entrepreneurs can increase their probability of success through repeated draws of ideas (Manso, 2016). Notably, this relies not just on small exit penalties, but also entry with little costs. It might therefore be unique to low human capital entrepreneurs in emerging markets where starting an informal new business requires little in the form of start-up investments.

Particularly in emerging economies, the self-employed with low levels of human capital should thus capture the ideal type of entrepreneurship as experimentation (Manso, 2016). They can try to start a business. If they succeed, they can reap large returns. But if not, they can return to their prior path in paid employment or even try to start another business.

High human capital entrepreneurs. Two key mechanisms govern the earnings consequences for high human capital entrepreneurs: the cost of venture growth and the ease with which they can return to paid employment. Some evidence from wealthy countries points to human capital characteristics, such as education, work-, and industry experience, positively predicting entrepreneurial returns and survival (Brüderl et al., 1992). Compared to the rest of the self-employed, those with high levels of human capital start incorporated ventures that can grow large and thereby drive earnings (Levine and Rubinstein, 2017; Van Praag et al., 2013). Yet, venture growth is costly, especially in emerging markets (Schoar, 2010). Firm formalization procedures are expensive and often slow. Access to finance, capital, and product markets is scarce and institutional environments frequently increase costs of labor. Tightly regulated business environments decrease the role of human capital and instead tip the scales in favor of incumbents and the well-connected (Ardagna and Lusardi, 2010). The earnings premiums reaped by Western high human capital entrepreneurs are thus unlikely to translate into many emerging markets contexts.

Penalties related to entrepreneurial experience are also exacerbated when former founders return to paid employment. High human capital entrepreneurs compete for salaried jobs with lengthy hiring processes, training periods, and formal job protections. For employers, the costs of hiring the wrong person are high and, particularly in lower-income economies, there are many people competing over few desirable jobs (Bandiera, Elsayed, Smurra, and Zipfel, 2022). These commitment costs magnify even small differences between candidates.

Employers struggle to evaluate the skills and intentions of former entrepreneurs with high levels of human capital. Assessing performance is challenging with little verifiable information and skills might not translate to the new employer (Mahieu et al., 2021; Rider et al., 2019; Sorenson, Dahl, Canales, and Burton, 2021). Meanwhile, they compete with people moving from one job to another who can point to performance reviews, promotions, prior salaries, and references, all verified by third parties (Mahieu et al., 2021). Leaving a venture also signals potential failure. But even successful spells raise commitment concerns: the entrepreneur might just be looking to bridge some time before starting a new venture (Botelho and Chang, 2023; Kacperczyk and Younkin, 2022).

If entrepreneurs are difficult to evaluate and employers risk making costly mistakes, former high human capital entrepreneurs have to take lower-paying jobs than their counterparts who remained in paid employment (Mahieu et al., 2021). They might even struggle to return to (salaried) employment at all (Botelho and Chang, 2023; Kacperczyk and Younkin, 2022). Evidence on serial correlation between wages in salaried employment and the lasting effects of job losses suggest that these penalties will persist for former high human capital entrepreneurs as well (Couch and Placzek, 2010; Mahieu et al., 2022).

Taken together, high failure rates, costs of growth, and penalties upon returning to paid employment should outweigh the chance of large earnings from entrepreneurial success.

Context: entrepreneurship in emerging economies

Rates of self-employment are high in emerging economies; a large proportion of global employment and economic output originates in microenterprises (ILO, 2021; Medina and Schneider, 2021). These businesses tend to be small, employ few outside of the immediate family, and often lack formal registration (Assenova and Sorenson, 2017). Most academic work on these businesses evaluates performance drivers amenable to policy interventions, such as access to capital and labor, or business training (de Mel, McKenzie, and Woodruff, 2019; McKenzie, 2021; Quinn and Woodruff, 2019).

In contrast, little research on organizations and careers focuses on the entrepreneurs starting these microenterprises, despite their activities often resembling those in the formal sector, employing over half the workforce across Africa, Asia, and Latin America, and accounting for over a third of economic output in these countries (Medina and Schneider, 2021). Exceptions focused on the organization highlight the costs and benefits of foregoing formalization (Assenova and Sorenson, 2017; Larsen and Witte, 2023) as well as the levels and consequences of differentiated offerings among microenterprises (Carlson, 2023). Work on business owners emphasizes how personal characteristics and attributes affect performance (Delecourt and Ng, 2021; Dimitriadis and Koning, 2022).

To study long-term consequences of entrepreneurship requires longitudinal data that is rarely available in these contexts. Relevant efforts use primary data sources, such as assettransfer experiments among the "ultra-poor" in India and Bangladesh (Balboni et al., 2021; Banerjee et al., 2021). Treated groups received livestock which allowed them to engage in low-growth agricultural entrepreneurship resulting in earnings boosts.

India

I focus on India as a case of an emerging economy. India has been a market economy since 1991 and although it quickly grew to become one of the world's largest economies, it remains lower-middle-income (Bhagwati and Panagariya, 2013). Its per capita income is similar to that of sub-Saharan African countries like Angola, Kenya, or Côte d'Ivoire. Around 10% of its population lives on less than \$2 per day.⁶

⁶https://databankfiles.worldbank.org/public/ddpext_download/poverty/ 33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_IND.pdf

Over 50% of working Indians engage in self-employment (ILO, 2018). These rates are comparable to countries in South Asia and Sub-Saharan Africa (ILO, 2021). Many engage in subsistence entrepreneurship. They often sell food, small goods, or clothes at local markets. Few employ non-family members (Banerjee and Duflo, 2007). Yet, at the other end of the spectrum exists a thriving entrepreneurial ecosystem populated by high-growth startups, incubators, private equity, and venture capital (Claes and Vissa, 2020; Hans and Vissa, 2023).

Opportunities for stable employment are scarce. More than 60% of those in paid employment engage in casual work (ILO, 2018). Less than 20% are salaried. As India's education levels are rapidly increasing, urban centers consist of many people competing over few salaried jobs. Even traditionally salaried work often uses short-term contracts instead. Labor protection laws create large costs of formality and stark divides between permanent and temporary workers (Amirapu and Gechter, 2020; Schwab, 2020). Social protections exist in piecemeal fashion and enforcement is lax. Over a third earn less than the minimum wage. Social benefit programs, such as unemployment insurance, require having contributed to public programs for years and are rarely available to those not working in salaried employment (ILO, 2018).

Data and Methods

I use data from the longitudinal Consumer Pyramids Household Survey (CPHS) of the Centre for Monitoring the Indian Economy (CMIE). The relatively young survey has been used to explore issues around policy (Chodorow-Reich, Gopinath, Mishra, and Narayanan, 2019), employment (Jayaraman and Khan, 2023), and entrepreneurship (Ghosh and Vats, 2023). On questions related to employment, the CPHS resembles the US Current Population Survey (Chodorow-Reich et al., 2019).

CMIE surveys households three times each year, with 4 months passing between each wave.⁷ They collect data from roughly 160,000 households each wave using a regionally-

 $^{^{7}}$ As teams continually cycle through the households in each region, households in different cities may be reached during different months.

stratified sampling approach similar to the Indian Census. I use data on individuals surveyed in the CPHS between January 2016 and December 2022. Although the CPHS data reach back to 2014, employment status was not recorded until 2016. While seven years of data might not capture as much time post-entrepreneurship as in Manso (2016) or Mahieu et al. (2022), rates of switching jobs and employment statuses are much higher in the Indian context. Even shorter time horizons contain several post-entrepreneurship employment spells and can be thought of as capturing long-term effects.⁸

The main advantage of the data lie in their large sample size and high frequency of waves as continually identifying people's employment status is central to estimating the long-term returns to entrepreneurship in this setting. Prior surveys in emerging economies, such as the Indian Household and Demographics Survey or the RAND Family Life Surveys from Malaysia or Indonesia, had smaller samples with gaps up to 7 years, precluding the estimation of longterm returns. The comparatively short intervals of the CMIE data are necessary to observe continuous entry and exit patterns.

However, the data are not without flaw. CMIE defines employment as solely pertaining to income-generating activities which makes capturing all forms of women's work, as well as comparing gender patterns to other data sources, difficult (Jayaraman and Khan, 2023, however, argue that this can be thought of as measurement error and use the data to study women's employment). The sample may also miss India's poorest households (Somanchi, 2021). However, my analysis of income trajectories among matched-groups does not require a representative survey on these dimensions. The matching approach estimates earnings trajectories among people with specific attributes, rather than population-average effects.

Ideally, the data would also contain information on job-spells and hybrid entrepreneurship. Similar studies compare those entering entrepreneurship to others switching jobs (Rider et al., 2019; Sorenson et al., 2021). This is less critical in this context as most of the non-salaried can

⁸Manso (2016) models effect sizes up to 12 years after entry into entrepreneurship Mahieu et al. (2022) up to six years after exiting entrepreneurship. I show results graphically for 12 waves, or four years, past initial entry.

be assumed to frequently switch jobs. While mechanisms might differ for hybrid entrepreneurs (Folta, Delmar, and Wennberg, 2010; Raffiee and Feng, 2014), CMIE records the primary form of employment only. My estimand, thus, identifies the long-term consequences of switching to self-employment as a primary source of employment.

Measuring entrepreneurship. I operationalize entrepreneurship as self-employment. Respondents are asked whether their primary form of income-generating activities are paid- or self-employment. I distinguish between different groups of entrepreneurs following Fairlie and Fossen (2018) by proxying for necessity entrepreneurship using pre-entry unemployment, while employment indicates opportunity entrepreneurship.⁹ Second, I proxy for the human capital of opportunity entrepreneurs using pre-entry employment type and education. I, primarily, show results using prior work in salaried (vs non-salaried, such as casual day labor) employment as an indicator of high human capital, but confirm results comparing those with- and without a college degree. Given that the survey does not record full employment histories, salaried employment indicates having worked one's way up into the most sought after, and stable, positions in paid employment.

Sources of heterogeneity. I draw on state-level heterogeneity of labor laws to highlight cost-related mechanisms related to growth and finding a job after the entrepreneurial spell ends. Strong employment protections characterize the labor market in India for those that fall under their jurisdiction. For example, under the Industrial Disputes Act (IDA), companies essentially need to obtain permission from the government before firing people. However, contract workers are exempt and the legislation only applies to plants past a certain size threshold. There is considerable state-level variation of this threshold and similar regulations. I use two measures of state-level employment regulations to proxy for the (commitment) cost of hiring an employee and the cost of growing one's business, respectively. For the former, I use Schwab's (2020) classifier of the strength of employment protection laws that focuses on

 $^{^{9}}$ I operationalize this based on the last wave before entry, but results are robust to using multiple waves of continued pre-entry (un-) employment for these measures.

variation in the IDA and similar regulations. Second, I use a measure developed by Amirapu and Gechter (2020) who estimate the cost of growth at 10 employees, a threshold at which a host of labor regulations start applying. While the Schwab (2020) measure more strongly captures the commitment cost of hiring in general, the Amirapu and Gechter (2020) measure identifies the cost of growth, via extra unit labor costs, for high human capital entrepreneurs.

Sample Construction and Matching.

I restrict the survey to adults between the ages of 18 and 70 who record at least one employment spell and were surveyed at least ten times. The ideal study estimates the effect of entering entrepreneurship for the first time to avoid capturing effects of repeat entrepreneurship (Eesley and Roberts, 2012). I remove all individuals who experience a self-employment spell in the first four waves in which they are observed. Due to left-censoring and the comparatively short time horizon of the data, this approach may still miss entrepreneurship spells pre-2016. Effects in this paper might, therefore, better be characterized as entering entrepreneurship for the *first time in a while*. However, the findings of this study are robust to using more stringent restrictions.

I combine (coarsened) exact matching with nearest neighbor matching to identify a control-group of similar others who did not enter self-employment (Iacus, King, and Porro, 2012; Sorenson et al., 2021).¹⁰ For each person who enters entrepreneurship, I identify potential matches of the same age bracket, education level, household size, gender, and urban-rural region type.¹¹ In the main specifications in this paper, I further match on control cases being in the same caste category and religion, whether another household member was self-employed in the past two years, as well as employment status (unemployed, non-salaried, salaried) and

¹⁰Some prior work (e.g. Mahieu et al., 2022; Manso, 2016) uses propensity score matching instead. Iacus et al. (2012) point out the advantages of CEM over propensity score methods. The former ensures balance on the (coarsened) matching variables. Given the size of the data, CEM could be used without losing power to identify effects.

¹¹I identify matches with replacement at the time of entry into the first entrepreneurial spell observed in the data. Each treated person, thus only appears once in the final sample. Control cases, however, can appear repeatedly. Standard errors are clustered at the matched group and household level to reflect this potential correlation across matched groups.

occupation (26 categories) from 4 to 2 waves pre-treatment.¹² In a more restrictive matching condition, I also match on whether the household owned a house, a car, or cattle as indicators of wealth that might affect both entry into and returns to entrepreneurship. In a less restrictive condition, I only match on core demographics and the respondent's state of residence and their employment status (employed, unemployed) during waves t-2 and t-3.

I follow prior work estimating income trajectories by matching on pre-treatment earnings (Campbell, 2013; Mahieu et al., 2022; Sorenson et al., 2021). Among potential matches identified via CEM, I identify up to four control cases with the closest income history, choosing two with higher and two with lower average incomes between 4 and 2 waves prior to entry. In an alternative approach I select a single control case using Mahalanobis matching on both the pre-treatment income average and slope. Overall, the matching approach tries to identify similar others who could have, but did not, enter entrepreneurship. Matching on the income and employment history leading up to treatment ensures that treated and control cases face similar levels of (in-)stability in the labor market and aims to guard against the possibility that entry into entrepreneurship is driven by higher levels of need or resources. While matching on pre-treatment outcomes are correlated with unobserved confounders as is expected in the case of entrepreneurial entry (Ham and Miratrix, 2022).¹³

I also condition on the control case being employed when the treated person enters selfemployment. To the extent that entrepreneurship provides employment, this might underestimate effects. However, not doing so might artificially inflate estimates if control cases are

 $^{^{12}}$ I did not match on the employment status during wave t-1 to allow for transitions to take place gradually. Particularly since CMIE captures only the main employment status, gradual transitions into entrepreneurship (e.g. Raffiee and Feng, 2014) remain unobserved and conditioning on the transition period might induce bias. However, the main findings of this paper are robust to matching on the wave immediate prior to entry as well.

¹³Ham and Miratrix (2022) and Roth, Sant'Anna, Bilinski, and Poe (2023) note that matching on pretreatment outcomes means that the main identifying assumption becomes that of unconfoundedness, rather than parallel trends. Like most other papers estimating the returns to entrepreneurial experience (e.g. Campbell, 2013; Mahieu et al., 2022), this study does not observe random entry into self-employment and relies, at its core, on the selection-on-observables assumptions. Therefore, reducing bias is the first-order concern.

not seeking work at the exact same time. Estimates thus capture the long-term effect of entrepreneurship over paid employment, rather than identifying when to become self-employed instead of remaining unemployed and continuing to search for paid employment.

The final sample contains 22,094 entrepreneurs and 60,782 matched cases. I do not find matches for around 60% of those entering self-employment in the data. While this might raise concerns regarding generalizability, the less restrictive matching condition finds control cases for over 60% of cases and produces similar results. Table 1 shows balance on pre-treatment income variables. It shows that treated and control cases had very similar income levels leading up to the self-employment spell. They are also comparable on the income slope and report similar levels of household expenditures.

Table 2 displays summary statistics. The large majority of the sample, 77%, is male. Around 25% have finished high school and one-third come from rural regions. Necessity entrepreneurs skew female. Unlike low human capital entrepreneurs, they vary in their education.¹⁴ Low human capital entrepreneurs (here: defined by prior salaried work status) tend to have lower levels of education, whereas high human capital entrepreneurs are majority college-educated and about half come from urban areas.

Entrepreneurial spells tend to be short in this setting, similar to the US (Manso, 2016). Figure 1a shows that over 60% last a year or less. Less than 10% last more than three years. Yet, more than 30% of those who ever experience a spell in self-employment re-enter a second time (Figure 1b).

Empirical Estimation.

I estimate the long-term earnings consequences of entrepreneurship using a matched group fixed effect event study, combining approaches from Sorenson et al. (2021) and Mahieu et al. (2022). I estimate the following equation:

¹⁴In supplementary analyses, I confirm that findings for necessity entrepreneurs are not driven by those with higher levels of education.

$$y_{it} = \alpha_g + \delta_t + \sum_{h=-Q}^{H} \beta_h D_{i,t-h} + \epsilon_{it}$$

in which α_g indicates a set of matched group g fixed effects and δ_t are wave-specific time t fixed effects. The matched group fixed effects act as flexible controls of all variables included in the matching procedure and do not presume any functional form. The coefficients $\sum_{h=-Q}^{H} \beta_h$ capture earnings trends of the treated units while $D_{i,t-h}$ indicates the dummy variables that jointly indicate the time pre- and post entering self-employment. ϵ_{it} denotes the error term.

 y_{it} is the dependent variable measured as a survey-wave's most recent month's income in Indian Rupees (Rs). This measure includes all income attributable to the individual including wages, dividends, and earned interest. It also includes income attributable to a business.¹⁵ The CPHS captures these at the household-level. When multiple household members are self-employed, I evenly divide the business-income between them.

This approach treats the first observed wave in entrepreneurship as an event, but remains agnostic to the length of the spell, the reason for entering, and the number of future waves spent in paid-, self-, or unemployment. It therefore collectively captures long-term differences in earnings driven by employment stability, income, earnings slopes, and employment type.

A recent literature identifies several sources of bias that can plague, particularly staggered, difference-in-differences or two-way fixed effect event studies (see e.g. Roth et al., 2023). While I rely on matched-group, rather than individual, fixed effects, it is still possible for negative weights or 'forbidden comparisons' to occur. I corroborate results using the alternative estimator from Callaway and Sant'Anna (2021), that avoids these concerns. This approach also resembles the implementation of individual-level fixed effects and confirms that results are not specific to estimations relying on group fixed effects.

 $^{^{15}\}mathrm{CMIE}$ confirmed that this measure closely resembles take-home pay, rather than profits that get reinvested into the venture.

Results

I will proceed as follows. First, I estimate the long-term earnings consequences of selfemployment pooling all sub-groups of entrepreneurs. Next, I focus on necessity entrepreneurs and the role of employment as the operating mechanism. Then, I demonstrate that returns for opportunity entrepreneurs depend on their human capital. I delve into earnings patterns for low human capital entrepreneurs to see whether they can exit without penalty. On the high human capital side, I assess whether entrepreneurs can return to salaried employment. Lastly I leverage variation in state-level legislation to identity the role of two key mechanisms in earnings trajectories: commitment costs for employers and the cost of venture growth.

I start by estimating the long-term returns to self-employment by pooling all sub-groups of entrepreneurs. Figure 2 graphs point estimates from five waves (20 months) before, to 12 waves (four years) after, entering self-employment. Wave 0 indicates the first wave during which an individual entered self-employment, with the dashed vertical line separating the pre- and post-periods. The y-axis indicates the estimated earnings difference, measured as the monthly income in Indian Rupees. These estimations follow Manso's (2016) approach by comparing those who *attempt* self-employment with those who never do. This means that the treated group is known to be self-employed at wave 0, but can flexibly exit entrepreneurship during later waves. Since the data span the COVID-19 pandemic, I start by showing results with and without including those who started their self-employment spell during 2020, the height of the pandemic. Future sections exclude 2020 entrants to remove idiosyncrasies of the COVID pandemic.¹⁶

In contrast to prior work from Western countries, Figure 2 indicates a persistent earnings premium to entrepreneurship that is highest immediately upon entering. Removing 2020 entrants slightly increases the magnitude of the point estimates. At t = 0, the self-employed

¹⁶Exploratory analyses indicate that there was substantive adverse entry during 2020. Larger numbers entered that incurred unusually large earnings penalties, particularly among the highly educated. Later years of the pandemic largely seemed unaffected and results more closely resemble the patterns of pre-pandemic times.

report an earnings increase of approximately Rs 2,300 or Rs 2,700 when excluding those who became entrepreneurs during the height of COVID. This corresponds to an over 20% increase compared to the average income in the sample. Over the the next few waves, point estimates decrease in magnitude, indicating a monthly income premium of close to Rs 1,000 about one year after entering, before beginning to increase again. Twelve waves (four years) after initial entry, entrepreneurs earn around Rs, 2,000 more than similar others who did not enter self-employment. Taken together, these results indicate a sizable, persistent earnings premium for entering entrepreneurship.

Necessity entrepreneurs

As there are strong reasons to expect different dynamics between necessity and opportunity entrepreneurs, I estimate returns separately for both groups in Figure 3. The estimates indicate vastly different patterns. Opportunity entrepreneurs exhibit a comparatively small immediate earnings bump that slowly increases over time. Necessity entrepreneurs experience an enormous immediate earnings increase that quickly levels off, but continues indicating a slight advantage over non-entrants four years later. I will focus on necessity entrepreneurs and the role of employment in driving their earnings trajectories in this section before returning to opportunity entrepreneurs later.

At t = 0, necessity entrepreneurs show an earnings premium exceeding Rs 6,000, which levels off around Rs 500 about two years after entry.¹⁷ Notably, despite matching on pre-entry earnings histories, necessity entrepreneurs do worse than matched controls before t0.¹⁸

What explains these large initial earnings premiums for necessity entrepreneurs? Earlier, I proposed that the main advantage would lie in providing any, or more stable, employment. Figure 4 investigates the role of continuous unemployment in the observed effects. I re-

¹⁷Taken together, these trends for opportunity and necessity entrepreneurs explain the U-shape of the original regression in Figure 2.

¹⁸Results using Callaway and Sant'Anna's (2021) estimator adjust for this pre-trend difference (see the robustness checks section or Figure A.8). They continue to show a substantial post-entry earnings premium at 12 waves.

estimate the previous regression, now including a time-varying control for unemployment status. This aims to "take out" the part of the effect that is explained by self-employment providing *any* employment. Figure 4 indicates that unemployment explains a large part of the effect, especially initially. It also largely explains the negative pre-trends. However, even controlling for unemployment, a notable earnings premium persists, apparently growing larger with time. This indicates self-employment is preferable to paid employment, not just by providing employment, but also as a better form of employment than available alternatives.

Mahieu et al. (2022) suggest post-entrepreneurship earnings penalties in Belgium partly reflect a compensating differential, with former entrepreneurs choosing to work less. Could the opposite explain positive effects here? Do entrepreneurs simply "choose" more work, or does necessity entrepreneurship enable access to more continuous work?¹⁹ Figure 4 suggests both factors contribute. The CMIE data are particularly insightful here as I can distinguish between those who are unemployed but seeking work and those who are not actively looking for employment. By controlling for the latter, I remove the effect of increased job search among the treated. The difference between point estimates from this regression and the one controlling for all unemployment should thus approximately capture the part of the effect that is driven by self-employment enabling people to work more. As expected, estimates both more active job seeking and work access, especially initially.²⁰

While employment has been identified to be the main driver of the necessity entrepreneur's earnings premium, it is important to remember that the empirical design conditions on the treated and control case *both being employed at wave 0*. Therefore, these results are not driven by the control case not finding any employment, but rather indicate that self-employment

¹⁹The extent to which this represents an unconstrained choice in this setting is an open question. I use the term "choose" liberally to foster comparison to prior work. Real-world constraints like social norms or demotivation due to employment difficulty likely play a role.

²⁰Some of the point estimates starting at around t = 3 indicate equal or slightly larger returns when controlling for all unemployment rather than just 'inactive' unemployment. However, when taking into account the more negative pre-trends in the latter regression, benefits of self-employment might still include being more likely to find employment, even after more than a year.

provides strong advantages in terms of employment stability in the short-run.

The declining magnitude over time indicates dissipating advantages in employment stability, either because controls find better paid work long-term, or the self-employed struggle to sustain their businesses. Further exploration in Appendix A.3 shows decreasing returns are driven by more entrepreneurs exiting self-employment. Those remaining self-employed less than a year see earnings quickly return to negative pre-trend levels, continuing to underperform matched controls. Those remaining self-employed over a year retain their premium longer, but still experience diminishing returns. Their initial Rs 8,000 premium declines to 0-2,000 after four years. Only those with multiple spells consistently show positive returns.²¹

Opportunity entrepreneurs and human capital

The consistent earnings increase for opportunity entrepreneurs in Figure 3 suggests different dynamics than in Western countries. Neither a persistent post-entrepreneurship earnings penalty, as in Mahieu et al. (2022), nor a short-term transition penalty, as in Manso (2016), seem likely. But do all opportunity entrepreneurs share this option value? Earlier, I suggested human capital may delineate segments where entrepreneurship signals negatively to employers and present a riskier proposition.

Figure 5 estimates long-term returns separately for two human capital indicators: preentry salaried work and college education. Both graphs indicate positive returns accruing to those with lower human capital levels. Entrepreneurs from daily wage work or non-salaried roles, and those without college degrees, report consistently higher incomes. Their premiums range from Rs 2,000-3,000 and Rs 1,500-2,500, respectively. Those previously salaried instead show a large initial penalty exceeding Rs 5,000, only disappearing after four years. Collegeeducated entrepreneurs experience a similar initial penalty, recovering slightly faster. While their trajectories resemble patterns from Belgium (Mahieu et al., 2022), the earnings discount for high human capital entrepreneurs in India disappears eventually.

 $^{^{21}\}mathrm{I}$ also confirm that these earnings trajectories are not driven by those with high levels of education in Appendix A.4.

These findings are consistent with former entrepreneurs with high levels of human capital trying to return to a labor market in which their entrepreneurial experience sends a negative, or uncertain, signal. The penalty for those who exit salaried work is slightly stronger than for those with a college degree, lending further support to the idea that penalties are most pervasive for those segments of the labor market in which competition and commitment costs are highest.²² Next, I explore the dynamics behind positive returns for low human capital entrepreneurs before dissecting the earnings discount of high human capital entrepreneurs.

Small penalties for failure among low human capital entrepreneurs.

What drives the strong, persistent returns for low human capital entrepreneurs? If India has higher entrepreneurial success rates, pooling successes and failures could mask costs apparent in the US or Belgium. Separating out unsuccessful spells can reveal penalties upon returning to paid work. Alternatively, experimentation costs could be negligible if entrepreneurs freely return without penalty. I will return to the role of commitment costs in experimentation in a later section focused on variation in labor protection laws.

I explore whether aggregate findings hide failure penalties by comparing earnings for entrepreneurs with a single short (maximum one year) spell, a longer spell, or multiple spells Presumably, short stints reflect less successful entrepreneurship spells before a quick return to paid work. Figure 6 highlights earnings trajectories of low human capital opportunity entrepreneurs reminiscent of Manso's (2016) experimentation idea. All groups earn premiums. Those self-employed for over a year immediately report large earnings increases that persist around Rs 4,000-6,000. Those with multiple spells start out with an initially stable earnings premium around Rs 2,000 that starts increasing five waves after entry to reach approximately Rs 3,500 at t+12. Those with a single short spell show an immediate bump upon entering that dips back to zero as they return to paid work, before stabilizing at a slight Rs 1,000

²²These findings are also consistent with high human capital entrepreneurs starting businesses that take longer to become profitable. Appendix A.9b indicates both large penalties for those who exit quickly as well as low initial returns in entrepreneurship, even for longer spells. This provides evidence that both penalties upon exiting and lower returns during the entrepreneurial spell contribute to the earnings discount.

premium. This single short spell trajectory is consistent with little to no failure penalty. Overall, low human capital entrepreneurs seem to follow an idealized version of Manso's experimentation idea. If they do not succeed, they can exit quickly and without punishment. In fact, low costs of exit (and entry) open up the opportunity of an earnings premium via repeated spells of entrepreneurship.²³

Costs for high human capital entrepreneurs.

High human capital entrepreneurs instead show a transitory earnings penalty (Figure 5). What drives this? Evidence below is consistent with high labor market commitment costs creating re-entry penalties and high costs of growth constraining self-employment earnings. These analyses use salaried work to proxy for high human capital. College education produces similar, but noisier, results.

Again, it is illustrative to graph effects by the length of the entrepreneurial spell. Negative effects might be driven by those who exit suffering a penalty, or by lower (or more delayed) returns among those who remain self-employed. Figure 7a indicates that both occur. The earnings patterns of entrepreneurs with a single short spell are largely indistinguishable from those with a long spell, or those with multiple spells.²⁴. This indicates that earnings penalties are driven both by lower returns in entrepreneurship and by a penalty upon exiting. Negative returns for those with a single, short spell provide evidence consistent with increased commitment costs in the labor market for this group of entrepreneurs. Even those that exit quickly struggle to return to the earnings trajectories of the matched controls who remained in paid employment. I start by focusing on this exit-penalty before returning to returns during self-employment in the next section.

²³In regressions not shown here, I confirm that the positive returns hold for those with multiple entrepreneurship spells who re-enter the same industry as well as those that switch to a new industry. Those that switch reap slightly larger returns, but both groups experience positive earnings trajectories. These regressions also guard against the possibility of mismeasurement due to entrepreneurs continuously running the same venture but taking breaks due to, e.g., seasonality, which then appear as multiple spells in the data.

²⁴A short spell here is defined as lasting a year or less. These patterns are robust to defining a long spell as lasting for at least two years instead. Estimates are noisier due to smaller sample sizes compared to low human capital regressions

I illustrate how entrepreneurial experience is associated with earnings and career penalties by examining the likelihood of returning to salaried employment. Prior work suggests that entrepreneurial experience is difficult to evaluate for employers and raises concerns about fit and commitment (Botelho and Chang, 2023; Mahieu et al., 2021). To the extent these loom large amidst high commitment costs, failure to return to salaried work could explain entrepreneurs' earnings penalties. I estimate the likelihood of working in salaried employment after the entrepreneurial spell ends. The regression therefore answers the question whether former entrepreneurs are less likely to work in salaried employment compared to similar others who did not enter entrepreneurship. Notably, I remove the (first) entrepreneurial spell: t-1 is the last pre-entry wave but t0 represents the first wave during which the person is not engaged in entrepreneurship any longer.²⁵ The right hand side of the estimated equation is otherwise identical to prior analyses, but I estimate a linear probability model using working in salaried employment as the dependent variable.

Figure 7b plots the likelihood of working in salaried employment for those who entered entrepreneurship from salaried employment. The graph separately plots results from regressions including all high human capital entrepreneurs (and their controls) and including only those with a single spell in entrepreneurship. A priori, it is not clear which of the two best illustrates the penalty of being unable to return to salaried work. If repeated spells in entrepreneurship are entered freely, as a choice, then including future spells in entrepreneurship would mechanically decrease the likelihood of returning to salaried employment. However, former entrepreneurs might also re-enter self-employment because they struggle to return to salaried employment. In that case, removing those with multiple spells in self-employment would underestimate effects. The true penalty, thus, likely lies in between the two.

Figure 7b shows that former high human capital entrepreneurs are less likely to return to salaried work than controls, even when excluding repeat entrepreneurs. The full sample

²⁵This approach resembles that used by Mahieu et al. (2022), though they are limited to it because of data limitations. Different matched-groups vary in the length of time that passes between t-1 and t0. However, within each group, and fixed effect, the same number of waves have been removed.

indicates that the probability of engaging in salaried employment for former entrepreneurs is approximately 20 percentage points lower than that of their matched counterparts at the time of exiting entrepreneurship. This penalty increases in magnitude levelling off just above 30pp after a year. The trajectory for those who do not re-enter entrepreneurship looks different. They slowly recover some of the initial penalty. At t-0 their probability of working in salaried employment is about 15pp lower than that of matched controls. However, after 12 waves the effect size is only about 5pp and statistically indistinguishable from zero.

Together, these results are consistent with high human capital entrepreneurs experiencing a penalty upon trying to return to paid employment that results in them being less likely to find salaried employment. Over time, penalties are overcome either via continuously seeking salaried employment (see those with a single spell in Figure 7b) or by attempting to start a second, potentially more successful venture (see those with a multiple spells in self-employment in Figure 7a). However, while transitory, there is a notable penalty that persists for around 3-4 years. Experimentation is, thus, not costless.

In contrast to what Manso (2016) finds in the US, those who remain self-employed for longer spells also experience an, at least transitory, earnings penalty (see those with one long spell in self-employment in Figure 7a). This suggests that the negative returns for high human capital entrepreneurs are not just driven by penalties that occur when re-entering the labor market, but also by lower returns during high-growth entrepreneurship compared to Western countries.

Labor regimes, commitment costs, and costs of growth

Findings to this point are consistent with commitment costs for employers driving the degree to which former entrepreneurs can smoothly return to paid work. However, low initial returns for high human capital entrepreneurs who remain self-employed for longer periods of time indicate that something else is driving their earnings discount as well. In this section, I draw on measures of two sets of regulation to provide further evidence for commitment costs facilitating frictionless returns for low human capital entrepreneurs and high costs of growth depressing earnings for high human capital entrepreneurs.

Commitment costs for employers of low human capital workers. What allows for frictionless transition patterns among low human capital entrepreneurs? Heterogeneity in employment protection laws suggest that low commitment costs for employers are a key driver. A lot of India's low human capital workers engage in casual paid work. They are subject to few enforced legal protections and are easily fired. Hiring these unprotected workers imposes little commitment burden on employers, who can easily replace them. Yet in some states, the legal framework is more strictly enforced and protects a broader swath of workers (Schwab, 2020). For example, the IDA protects firms with at least 50 employees in West Bengal but only those with 300+ employees in Uttar Pradesh. States also differ in (the enforcement of) protections for contract workers. If low commitment costs engender frictionless experimentation, state variation in employment laws should affect returns to attempting entrepreneurship.

Figure 8a shows results from a regression in which I interact the treatment dummies with a binary variable indicating the stringency of state-level employment law protections based on Schwab (2020). Results indicate that low human capital individuals gain higher entrepreneurial returns in states with weaker employment protections and lower firing costs.²⁶ This suggests that by enabling low-cost workforce churning, lax labor regulations allow low human capital individuals to experiment with entrepreneurship while retaining the option to costlessly return to paid work. When commitment costs increase, experimentation becomes more costly.

²⁶Notably, analyses not shown here indicate that similar patterns persist when assessing earnings *after* the entrepreneurial spell has ended, indicating that increased transition costs are driving decreased returns to attempting entrepreneurship. Entrepreneurs in states with stricter employment protection laws earn around Rs 1,000 less than the control group a year after exiting self-employment, while those in states with comparatively laxer laws experience an earnings premium of about Rs 500 (which is statistically insignificant from the control group). The earnings patterns of both groups of entrepreneurs converge after about 3 years.

Costs of growth for high human capital entrepreneurs. What is driving the earnings discount among high human capital entrepreneurs? I suggest that high costs of growth contribute in this setting. Outside of the informal-sections of the labor market, India is characterized by strict labor laws. Aside from the IDA legislating employment protections for large plants, another set of regulations adds significant costs related to taxation, business registration, worker benefits, and safety once a firm reaches 10 employees. There is considerable state-level variation in both the text as well as enforcement of these laws. Amirapu and Gechter (2020) use observed firm behavior to estimate the regulation-induced extra unit labor costs for different states. Given that prior research has documented positive returns to entrepreneurship for those building organizations with growth potential (e.g. Levine and Rubinstein, 2017; Sorgner et al., 2017), regulatory barriers to growth might curtail earnings of those entrepreneurs starting these organizations.

I interact Amirapu and Gechter's (2020) estimated measure of state-level extra unit labor costs with the treatment dummies to assess whether costs of growth drive the earnings discount for high human capital entrepreneurs. Figure 8b graphs estimated returns at the 10th and 90th cost percentile. Notably, the estimates for states with low labor costs are noisy. Yet, they are also substantively larger than in states with high labor costs. Point estimates for high human capital entrepreneurs in states with lower costs of growth are positive, though most confidence intervals include zero. High human capital entrepreneurs in states with high extra-unit labor costs, however, experience a large earnings penalty that slowly ameliorates over time. The estimates for entrepreneurs in states with high vs low costs of growth are statistically different from one another for most of the first six waves following entry into entrepreneurship. Overall this evidence is suggestive of high costs of growth contributing to the earnings penalty faced by entrepreneurs.

Across analyses, the findings thus suggest that for the majority of people in India entrepreneurship is an attractive option. Only high human capital entrepreneurs experience an earnings discount. Necessity entrepreneurs reap large benefits, but they struggle to remain self-employed over time. If they do, or if they can start another business, they do much better than matched controls. Low human capital entrepreneurs benefit from an idealized form of experimentation that translates to a substantial earnings premium. High human capital entrepreneurs on the other hand face high costs of growth as entrepreneurs and struggle to return to salaried work after exiting.

Robustness checks.

I conduct several robustness checks to ensure that results are not driven by the empirical strategy and to rule out a few alternative explanations.

Matching design. First, I investigate the sensitivity of results to the matching design. I replicate Figure 2 varying the matching strategy in three ways. Instead of matching on household size, religion, caste, occupation-history, and detailed employment-status history, in the lite-CEM condition, I only match on basic demographics, the state of residence, and un-(employment) at t-2. In the wealth condition, I match on all indicators from the main condition but add owning a house, car, or cattle as indicators of wealth. I also vary finding the four closest matches on average income, or finding one control case matching on both average income and the income slope from t-4 to t-2. Appendix A.1 compares results from all four approaches. Some matching approaches result in slightly more negative pre-trends than the main estimates, but the overall pattern of results looks very similar. Little change in estimates from the wealth-matching condition indicate that results are not driven by capital facilitating entry or business growth (cf. Quinn and Woodruff, 2019). The lite CEM approach shows the smallest effect sizes, but when matching on income slope, it becomes similar to other estimates. This indicates that combining the lite CEM condition with matching on average income does not identify control cases with comparable pre-treatment earnings trajectories.²⁷

²⁷In regressions not shown here, I also that patterns hold when using not-yet-treated, i.e. people who enter entrepreneurship later, as control cases. Estimates are reduced in magnitude and noisy (since they eventually enter entrepreneurship and then cannot act as control cases anymore), but confirm the main results.

Estimator. Next, I corroborate the findings from Figure 2 using an alternative estimator. I re-estimate the relationship between attempting self-employment and monthly earnings using the estimator from Callaway and Sant'Anna (2021) to ensure that results are not driven by issues such as negative weights that can plague OLS event study designs. Figure A.2 compares results of the alternative estimator to the OLS ones. The two estimators produce initially comparable results, though, interestingly, at later time horizons estimates using the Callaway and Sant'Anna (2021) method decrease somewhat in magnitude. I separately corroborate findings for necessity- and opportunity entrepreneurs using the Callaway and Sant'Anna (2021) estimator for two reasons. First, the alternative estimator suggested smaller effects in the long run for the pooled regression. Given that some of the estimates in Figure 3 start nearing zero, I want to ensure that the same is not occurring here, which could lead to directionally different results. Second, the estimator allows weighting on pretreatment variables using inverse-probability weighting. I include the average pre-treatment earnings (from t-4 to t-2) to try to adjust for the negative trend observed among necessity entrepreneurs leading up to treatment. Figure A.8 graphs results. The patterns look largely similar to OLS results but differ in two ways: First, adjusting for the pre-trend bumps up the estimated coefficients for necessity entrepreneurs and they no longer approach zero, even after four years. Second, the earnings premium for opportunity entrepreneurs now looks flat, rather than indicating the slight upward trend observed earlier. However, it continues to indicate an earnings premium.

Alternative explanations. Next, I explore the robustness of results for opportunity entrepreneurs to a set of alternative explanations. First, I confirm that the positive earnings trajectories for opportunity entrepreneurs are not driven by increased rates of employment among those entering entrepreneurship. If alternative employment options remain precarious even for many opportunity entrepreneurs, particularly those whose other option might be daily wage work, we might find that they, too, gain most benefits from continued employment. They might be necessity entrepreneurs 'in disguise'. Appendix A.5 confirms that this is not the case. The figure repeats the exercise conducted for necessity entrepreneurs and controls for unemployment. Taking away the part of the effect that is driven by increased rates of employment explains very little: estimates of the two regressions look very similar.

Another set of alternative explanations has industry-effects in mind. On the one hand, increased earnings for entrepreneurs could be driven by them being able to leverage their industry-specific skills. For that to lead to an earnings premium, one would have to assume that the control group, which remains in paid employment, is forced to switch industries and therefore cannot leverage industry-specific skills to the same extent as entrepreneurs who managed to enter self-employment in an industry in which they have already developed those skills (Eesley and Roberts, 2012). If this explanation held true, we would expect a larger earnings premium for entrepreneurs who remained in the industry in which they were previously employed. On the other hand, entrepreneurs might enter industries that pay better, i.e. they strategically switch industries or move along the occupational hierarchy (Banerjee et al., 2021). If this were driving results, one would expect the opposite pattern: entrepreneurs who enter an industry that differs from the one in which they were previously employed should drive the earnings premium.

Estimations dividing the sample into those entrepreneurs who remained in the same industry and those who switched, provide little evidence for either explanation. Appendix A.6 shows increased returns for entrepreneurs who hold industry-specific skills at t0. However, they quickly return to levels of industry-switchers. After two years, a couple of coefficients indicate slightly higher returns for switchers, though these mostly remain statistically indistinguishable from one another. Both groups consistently reap positive returns. Taken together, these findings provide little support indicating that industry-specific skills or transitions to higher-paying industries are the main drivers of increased earnings.

Next, I try to guard against alternative explanations that have the left-censoring of the data in mind. For example, positive effects might be driven by serial entrepreneurs (Gompers et al., 2010) if those I observe to enter have entrepreneurial experience from before they took

part in the survey. I ensure that results are not driven by prior unobserved experiences by reestimating regressions for younger entrepreneurs, since these have had less time in the labor market during which they could have made experiences or learn skills that simultaneously predict earnings and the likelihood of entering entrepreneurship. Appendix A.7 continues to show strong, positive effects for entrepreneurs (vs matched cases) who are 35 (or 25) or younger, indicating that effects are unlikely to be driven by the left-censoring of the data.

In light of often skewed returns to entrepreneurship (Hamilton, 2000; Moskowitz and Vissing-Jørgensen, 2002), I explore whether any of the patterns above are specific to certain parts of the distribution and whether they hold at the median, instead of the mean, as well. I estimate unconditional quantile regressions with fixed effects at the 25th, 50th, and 75th quantile following Rios-Avila and Maroto (2022). Figure A.10 in the appendix shows results for necessity and opportunity entrepreneurs as well as low- and high human capital opportunity entrepreneurs. For necessity entrepreneurs, large proportions of zeros negate the ability to estimate effects at the median, but patterns at the 75th quantile look largely the same. Patterns for opportunity entrepreneurs also largely hold, though pre-trends show a slight upward trajectory. Positive returns hold at the median and loom large at the 75th quantile, though drop somewhat below pre-trends at the 25th quantile. The patterns for low human capital entrepreneurs look similar, but show slightly more muted, yet still positive, trends at the median. For high human capital entrepreneurs, the negative returns are driven by those at the median of the income distribution, and above, whereas those at the 25^{th} quantile experience slightly positive returns. Overall these results suggest that returns vary across the income distribution, but patterns at the median are similar to mean-results.

Discussion

An emerging stream of literature estimates the long-term returns to entrepreneurship, seeking to understand the career consequences of experimenting with self-employment (Burton et al., 2016; Mahieu et al., 2022; Manso, 2016). But entrepreneurs vary substantially in their motivations for starting businesses and in the constraints and alternative opportunities they face once launched. Thus, differing findings across prior research prompt questions for theory development: Which entrepreneurs should we expect to hold the option of returning to paid employment with little friction (Manso, 2016)? And for which groups do costs of returning to paid to paid work outweigh potential entrepreneurial gains (Mahieu et al., 2022)?

I argue that the answer depends on the type of entrepreneur, distinguishing between necessity and opportunity entrepreneurs as well as the latter's human capital. Using data from India, this paper assesses long-term earnings consequences for entrepreneurs across a spectrum of growth potential and incorporates returns for micro-entrepreneurs — the largest global group of self-employment. Using a large-scale household survey, I document a set of facts: (i) those entering self-employment in India experience a lasting earnings premium; (ii) this premium largely stems from self-employment income, rather than a premium on prior entrepreneurial experience (cf Campbell, 2013); (iii) the effects for necessity entrepreneurs are strongest in the short-run, representing temporary gains from continuous employment; (iv) opportunity entrepreneur premiums are driven by those with low human capital — high human capital individuals experience penalties from which they recover only slowly.

While continuous employment acts as the dominant mechanism for necessity entrepreneurs, earnings trajectories of opportunity entrepreneurs are largely determined by the (lack of) costs of experimentation. Those with low human capital face low failure costs, enabling frictionless transitions between self- and paid employment. Low commitment costs for employers appear to ease these transitions. They also raise the possibility of repeat entrepreneurship. Opportunity entrepreneurs with high levels of human capital, on the other hand, experience an earnings penalty from which they are slow to recover. They face two burdens. They struggle to return to the high-paying, salaried jobs they held before entering entrepreneurship, in line with prior evidence indicating that employers hold concerns about commitment and fit (Botelho and Chang, 2023; Kacperczyk and Younkin, 2022). Additionally, context-dependent regulatory burdens also increase their costs of growth.

These findings suggest that for most people in India, potentially large returns from entrepreneurship outweigh the small costs of returning to the labor market. However, a more rigid labor market for high human capital entrepreneurs magnifies concerns about performance and commitment.

Another way to interpret these findings focuses on the variety of entrepreneurship in India compared to the US or Belgium. India, comparatively, represents a context of extremes — the ultra-poor as well as those starting high-growth technology ventures. Many of the low human capital entrepreneurs in India start micro-enterprises and engage in a type of subsistence entrepreneurship that is rarely observed in Western countries. This paper, thus, extends prior work to include a broader array of entrepreneurs. India's high human capital entrepreneurs might be more comparable to populations of entrepreneurs observed in the US and Belgium.²⁸ Findings for this group settle in between the persistent penalties in Belgium and the short-term penalty in the US.

The institutional environment in India also differs from that in Western countries. It has very stringent labor protections for workers in large organizations in the formal sector, but contract workers and those in the informal sector can expect little in terms of institutional support (Schwab, 2020; Sundar, 2011). While this makes aggregated findings hard to compare to other countries, I have highlighted how patterns vary for different groups, and under different conditions, to identify the mechanisms that should generalize beyond the unique context. For example, one might expect earnings trajectories for necessity and opportunity entrepreneurs with low human capital to generalize to similar emerging markets contexts. From a theory-perspective, these findings show that patterns of experimentation, and thereby positive long-term earnings consequences, become most pronounced when commitment costs for employers are low. This is the case in countries like the US or Denmark, in which

 $^{^{28}}$ The average entrepreneur in Manso's (2016) study went through about 14 years of education and while Mahieu et al. (2022) do not show data on education, over 50% of the entrepreneurs in their sample previously worked white-collar jobs.

institutional environments allow organizations to hire and fire quickly. In countries with more stringent worker protections, like Belgium, Germany, or France, we would expect penalties to be stronger, and more persistent. At the same time, the institutional environments of many rich nations try to foster ventures with growth potential. Earnings for high human capital entrepreneurs might thus be higher *during* the entrepreneurial spell itself.

This paper makes several contributions. First, it builds a theory around how earnings trajectories and patterns of experimentation vary for different types of entrepreneurs. It thereby incorporates prior work highlighting variation in growth potential, motivations for entry, constraints, and alternative opportunities to the literature on entrepreneurial careers (Gimeno et al., 1997; Nikiforou et al., 2019; Sorgner et al., 2017). In particular, evidence highlights commitment costs of potential future employers and the cost of venture growth as two mechanisms that vary across entrepreneurs and institutional environments. Both play a crucial role in the long-term earnings patterns of entrepreneurs and help explain contrasting findings in prior work.

Second, I directly estimate the returns to necessity entrepreneurship. Prior work has largely compared necessity entrepreneurs to their opportunity counterparts (O'Donnell et al., 2023). While these comparisons inform policy, individuals decide between entrepreneurship and paid work. Prior studies using Western data lacked large enough necessity entrepreneur samples to estimate returns, while emerging economy data often lacked longitudinal waves to separate low human capital from necessity entrepreneurs.

The divergent earnings trajectories of these two groups emphasize the importance of theoretical distinction. Criticism of the construct of necessity entrepreneurship centers around it capturing potentially disparate groups by including everyone who entered for economic reasons (O'Donnell et al., 2023). For many, alternative employment options exist. Considering the immediate urgency of employment provides clarity on both the types of ventures that entrepreneurs can found and their alternative employment options. When alternatives exist, entrepreneurs can enter deliberately, identifying, discerning, and exploiting local market gaps (Barach and Rider, 2023).

Third it extends prior work on the long-term earnings consequences of entrepreneurship to an emerging market context. Previously, data availability has limited researchers to study these dynamics in richer economies. In the aggregate, findings differ starkly from prior work using Western data. When pooling all the self-employed, I do not even find a shortterm penalty to attempting entrepreneurship (cf. Mahieu et al., 2021; Manso, 2016). This paper highlights how different contexts are populated by different groups of entrepreneurs in different institutional environments. The underlying drivers of long-term earnings vary for different types of entrepreneurs but commonalities across contexts suggest generalizability of mechanisms (e.g. penalties for high human capital entrepreneurs Botelho and Chang, 2023; Kacperczyk and Younkin, 2022; Mahieu et al., 2022).

Fourth, this paper empirically illustrates an untested theoretical prediction from Manso's (2016) model: positive returns due to repeat experimentation with entrepreneurship. A prior line of literature has attributed the success of serial entrepreneurs to skill or learning (e.g Eesley and Roberts, 2012; Gompers et al., 2010). When the costs of failure (and entry) are low, a simpler answer becomes possible: repeated attempts increase the probability of a successful draw.

The findings from this paper seem to buttress calls for policy supporting entrepreneurship. But rather than focusing on entrepreneurs that can create jobs for others (Levine and Rubinstein, 2017; Sorenson et al., 2021), entrepreneurship can act as a direct pathway to (better) employment. If low-growth, or subsistence, entrepreneurship provides jobs with increased earnings potential without presenting negative downstream consequences, policy makers could consider further trying to alleviate barriers to entry. In fact, this paper indicates that self-employment does not just serve as a pathway to increased earnings among the ultra-poor, but can provide a good form of employment for large swaths of people in emerging economies (cf. Balboni et al., 2021; Bandiera et al., 2022).

Of course, there is a question whether entrepreneurship can, or should be, a long-term

solution to providing good employment in emerging economies. Given rapid increases in rates of education, one can imagine a world in which people would be able to find jobs that make more targeted use of their human capital. As such, it seems that we can view these opportunities in self-employment as a bridge to helping people find decent employment in highly competitive labor markets in which many highly educated people compete for too few desirable jobs (Bandiera et al., 2022). In some ways, employment structures in emerging societies today thus resemble Western societies of the past, when self-employment was more dominant (Arum and Müller, 2004). As more large- and medium-sized employers start to saturate the labor market, we might see the returns to entrepreneurship decrease and the cost of experimenting with it rise.

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Tables and Figures

Variable	(1) Matched Mean/SE	(2) Treated Mean/SE	T-test Difference (1)-(2)	Normalized difference (1)-(2)
Income average	$10,353 \\ (52.7502)$	10,286 (88.4388)	66.2089	.005076
Income slope	.114673 $(.001418)$.116524 $(.002521)$	001851	005193
Income (t-2)	10,846 (55.9262)	$10,\!804 \\ (93.2554)$	41.768	.003025
Household expenditure average	12,648 (27.7248)	$12,545 \\ (42.3242)$	102.708	.015342
Household expenditure (t-2)	13,107 (33.1012)	$13,015 \\ (50.9685)$	91.7306	.011453
N	60782	22094		

Table 1: Balance Table

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

	Full Sample		Nec. Ent.		Low-HC Ent.		High-HC Ent.	
	mean	sd	mean	sd	mean	sd	mean	sd
Age	39.96	10.76	38.49	12.58	40.22	10.21	42.50	9.22
Female	0.23	0.42	0.62	0.49	0.08	0.28	0.03	0.18
Education								
<5th grade	0.19	0.39	0.21	0.40	0.21	0.41	0.02	0.14
5th-9th grade	0.43	0.49	0.33	0.47	0.54	0.50	0.11	0.32
10th-11th grade	0.13	0.34	0.12	0.33	0.16	0.36	0.15	0.35
High school	0.09	0.29	0.17	0.37	0.06	0.23	0.13	0.33
College	0.16	0.37	0.18	0.38	0.03	0.18	0.59	0.49
Household size								
1-3	0.32	0.47	0.34	0.47	0.31	0.46	0.38	0.48
4-5	0.51	0.50	0.49	0.50	0.51	0.50	0.52	0.50
6+	0.17	0.37	0.18	0.38	0.18	0.39	0.11	0.31
Rural	0.33	0.47	0.35	0.48	0.38	0.49	0.11	0.31
Hindu	0.92	0.27	0.92	0.26	0.88	0.32	0.94	0.25
Caste category								
Upper Caste	0.15	0.36	0.23	0.42	0.11	0.32	0.36	0.48
Intermediate Caste	0.03	0.16	0.05	0.21	0.02	0.13	0.07	0.26
Scheduled Caste	0.39	0.49	0.20	0.40	0.36	0.48	0.17	0.38
Scheduled Tribe	0.08	0.27	0.06	0.25	0.08	0.28	0.04	0.19
Other Backward Class	0.35	0.48	0.46	0.50	0.42	0.49	0.34	0.47
Employment status (t-1)								
Unmployed	0.24	0.43	1.00	0.00	0.00	0.00	0.00	0.00
Non-salaried	0.59	0.49	0.00	0.00	1.00	0.00	0.00	0.00
Salaried	0.17	0.37	0.00	0.00	0.00	0.00	1.00	0.00
Monthly income (in 1k INR)	10.99	11.28	3.95	5.80	10.22	5.56	26.32	13.79
Ν	82,876		$6,\!564$		$11,\!911$		$3,\!526$	

Table 2: Summary statistics

The "Full Sample" column provides summary statistics on the entire sample including both entrepreneurs and matched controls. The next three sets of columns provide summary statistics for the entrepreneurial sub-groups, not controls. Variables are measured at the time of treatment unless otherwise indicated.



Figure 1: Patterns of entrepreneurship spells



Figure 2: Pooling all the self-employed reveals a long-term earnings premium.



Figure 3: Income trajectories distinguishing between opportunity and necessity entrepreneurs. Pre-entry unemployment proxies for necessity entrepreneurship. While necessity entrepreneurs reap a large initial earnings premium, it diminishes over time. Opportunity entrepreneurs on the other hand, those who entered from employment, reap a consistent earnings premium that slightly increases over time.



Figure 4: Earnings trajectories for necessity entrepreneurs. Strong positive effects for necessity entrepreneurs are almost exclusively driven by employment. When controlling for unemployment (yellow diamonds), the large initial earnings spike disappears. Controlling for out-of-the-labor-force unemployment reduces estimates, but not to the same extent. This indicates that entrepreneurs are able to work more continuously but part of the effect is also driven by them seeking work at higher rates.



Figure 5: Income trajectories for opportunity entrepreneurs (employed at t-1) by human capital. Using both prior work in salaried employment as well as holding a college degree as proxies for human capital, the graphs show an initial earnings discount for high human capital entrepreneurs that disappears over time. Low human capital entrepreneurs experience a consistent earnings premium.



Figure 6: Returns for low human capital entrepreneurs, those entering from non-salaried work (e.g. casual or temporary employment), by the type of spell. Those who remain self-employment for a long time, more than a year, reap large positive returns. Those who exit quickly, in a year or less, only reap a slight premium. Those who re-enter entrepreneurship a second time reap a premium in between the other two.



(a) By entrepreneurship spell type

(b) Likelihood of finding salaried employment

Figure 7: Income trajectories and the likelihood of finding salaried employment for high human capital entrepreneurs, those who were previously salaried. Panel (a) shows earnings trajectories different types of spells: short (one year or less), long (over a year), and those with more than one entrepreneurial spell. All three groups display a similar initial earnings discount from they slowly recover. Panel (b) estimates the likelihood of working in salaried employment. These regressions remove the (first) spell of entrepreneurship. The graphs shows the likelihood while including (red circles) or excluding (blue triangles) those with repeated spells in entrepreneurship. When excluding them, former high human capital entrepreneurs slowly return to similar rates of working in salaried employment after four years (compared to matched controls who did not enter self-employment).



(a) Low human capital entrepreneurship returns by labor protection laws

(b) High human capital entrepreneurship returns by cost of growth laws

Figure 8: Income trajectories by regulation. Panel (a) shows returns for low human capital entrepreneurs (non-salaried) for those in states with strong (vs weak) labor protection laws. In states in which these laws are more strongly enforced, low human capital entrepreneurs reap a smaller earnings premium. Panel (b) shows results for high human capital entrepreneurs using heterogeneity in (the enforcement of) state laws that govern the cost of firm formalization, employee benefits, and other costs of growth. In states in which these are more lax, the earnings discount for high human capital entrepreneurs disappears.

A Appendix



Figure A.1: Alternative samples for main regression — compare to Figure 2



Figure A.2: Alternative estimator for income trajectories of the pooled self-employed — compare to Figure 2



Figure A.3: Necessity entrepreneurs by type of self-employment spell



Figure A.4: Both necessity entrepreneurs with and without a college degree experience a similar earnings trajectory suggesting that the results for necessity entrepreneurs are not sensitive to human capital.



Figure A.5: Controlling for employment explains little of the effect for opportunity entrepreneurs



Figure A.6: The earnings premium for opportunity entrepreneurs varies little between those who switch from vs remain in their pre-treatment industry



Figure A.7: Positive effects continue to persist for younger opportunity entrepreneurs



Figure A.8: Alternative estimator for opportunity/necessity regressions — compare to Figure 3



(b) Salaried

Figure A.9: Returns by salaried/non-salaried and spell length and type





(d) high human capital Entrepreneurs

Figure A.10: Unconditional quantile regressions with fixed effects



(a) Low human capital entrepreneurs by caste

(b) High human capital entrepreneurs by caste



(c) Low human capital entrepreneurs by gender

Figure A.11: Long term earnings consequences for opportunity entrepreneurs by caste and gender. The graphs indicate that caste plays a small role but female low human capital entrepreneurs experience a sharper decline, their earnings patterns are reminiscent of necessity entrepreneurs.



(a) Low human capital entrepreneurs by pre- (b) I entry income slope entry

(b) High human capital entrepreneurs by preentry income slope

Figure A.12: Long term earnings consequences for opportunity entrepreneurs by human capital and pre-entry earnings slope indicate that trends are not driven by potentially hidden necessity entrepreneurs