Opportunity vs Necessity: Understanding the Heterogeneity of Female Micro-Entrepreneurs

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Abstract

Entrepreneurs that voluntarily choose to start a business because they are able to identify a good business opportunity and act on it {*opportunity* entrepreneurs- are di er-ent in distinct dimensions from those who are forced to become so because of lack of other alternatives -*necessity* entrepreneurs. Relying on a unique dataset covering a wide array of characteristics, including cognitive, non-cognitive skills and managerial practices, for 10,000 female entrepreneurs in Mexico, we aim to understand the role of heterogeneity of micro-entreprenurs over rm performance focusing on a speci c criterion: the reason for opening their business. We document signi cant di erences on many dimensions between these two groups, most importantly in terms of pro tability, management, cognitive and

1 Introduction

Support programs for micro-businesses have become increasingly common in developing countries in recent years for at least two reasons: first, micro-enterprises employ a substantial fraction of individuals in these economies (about 47 percent in Mexico); and second, despite their prevalence, the majority of these micro-enterprises tend to stay small and have low productivity. However, the impact of such programs many of which provide business grants, training or a combination of both has been mixed at best. This raises the question about whether these impacts depend on characteristics or attitudes of the entrepreneur, which can be identified and measured for better targeting. In fact, some existing evidence suggests that, even though the mean effects of business training might be small and not significant, greater returns are concentrated in high-potential entrepreneurs, who are the most likely to adopt better entrepreneurial practices and earn higher profits after training (Calderon *et al.* 2013, De Mel *et al.* 2012, Fafchamps *et al.* 2014).

In this paper we aim to better understand the role of opportunity and necessity on firm performance. Are there specific characteristics that consistently differentiate those who choose to be so because they are able to recognize and act on good business opportunities, from those who become and remain entrepreneurs because they are unable to find a suitable paid job? If so, how could we classify opportunity vs necessity micro-entrepreneurs? Does facing a better chance to open a business that is not correlated with the social or cognitive skills causes a significant difference in the entrepreneurial performance? These are the questions we aim to answer by using a unique dataset which provides detailed information on business outcomes, access to credit, cognitive and non-cognitive skills for a large sample of female micro-entrepreneurs in selected urban areas in Mexico. These data come from the baseline survey for the evaluation of a large business training program implemented by the Ministry of Economy and the NGO CREA, for female entrepreneurs in Mexico, *Mujeres Moviendo Mexico*.

We define opportunity and necessity entrepreneurs according to the reason for opening their business. This variable is self-reported by the entrepreneur, but we show that it is positively correlated with better business outcomes, like profitability and management practices. Our measure of opportunity is also correlated with higher measures of cognitive ability and some of non-cognitive abilities that are key for business performance. In addition, we observe

that opportunity is one of the variables that show a higher correlation with various measures of performance.

Given the large heterogeneity within the group of necessity entrepreneurs, we use a discriminant analysis approach in order to identify those necessity female entrepreneurs that behave as opportunity. We aim to pin down some observable characteristics that allow to identify within the necessity entrepreneurs those that most resemble to opportunity ones. Discriminant analysis is a technique of species classi cation that has been used before by de Mel, McKenzie and Woodru (2010) to compare self-employed workers, wage workers and small and medium enterprise owners in Sri Lanka.

Finally, by using an instrumental variable approach, we aim to uncover how the performance of micro-entrepreneurs di ers when they face an exogenous shock that pushes them to start a business acting on opportunities rather than being forced to become a self-employed in order to meet their needs. The GDP growth in the state and at the time when the business was opened is used as an instrument for our measure of opportunity.

Our results suggest that starting a business because of opportunity is correlated with a

in Latin America, micro- rms led by women have been found to have an even smaller size and lower productivity, compared to those led by men (Bruhn, 2009). Thus, the evidence provided in this paper can be readily applied to those in more need of targeted support.

2 Data

micro-entrepreneurs in our sample are 45 years old and have 8.6 years of schooling, which corresponds to some secondary education. About 14 percent of them are classi ed as poor , which is very low, but consistent with the fact that they are in urban areas. The mean value of the capital in their business is $19,300 pesos (1378 USD), but the median capital is much lower ($8000 pesos, 571 USD). Mean age of the business is 107 months (about 9 years) and the median is 60 months (5 years). In addition, about 25 percent of businesses have been operating for 12 months or less, so a sizable portion of our sample is comprised by relatively young rms. Most female micro-entrepreneurs in our sample are self-employed, at least 75 percent have no other employees besides the entrepreneur herself.

Regarding sector of economic activity, approximately 62 percent of the businesses in our sample are in the retail sector, 33 percent in services, and only 5 percent in production. Mean daily pro ts are about 5.4 times the daily minimum wage in Mexico (MW= to 65.6 pesos in 2014), and median pro ts are about 2.3 times the minimum wage. These averages though hide a very large heterogeneity as the pro ts of those entrepreneurs in top quartile are four times those of the entrepreneurs in the bottom quartile.

There is considerable heterogeneity within our sample. The median value for self-reported daily pro ts is $150 pesos, while the maximum values observed on this variable (excluding the top 1% outliers) is more than 18 times larger. In terms of the distribution of the value of capital for these rms, we observe that the 75th percentile is 57.5 times larger than the 25th percentile rm which capital value is around $400 pesos.

In order to better understand the underlining drivers of this heterogeneity we focus on the di erences between opportunity and necessity entrepreneurs focusing on four groups of characteristics: (i) Business performance measures; (ii) business practices; (iii) characteristics of the business and the entrepreneur; (iv) cognitive skills; and (v) non-cognitive skills.

The main outcome variables used in order to determine the di erences between necessity and opportunity are measures of performance: (i) self-reported measures of weekly pro ts and (ii) composite business practice score (CBP score). Weekly pro ts are self-reported by the entrepreneur. CBP score is an index that measures how well entrepreneurs in our sample manage their business and is constructed considering measures of marketing, keeping stock, record keeping and nancial planning, following Fafchamps and Woodru (2014).

To identify the mechanisms that drive the di erence in measures of performance between

breaking the sample into opportunity and necessity entrepreneurs. We also report the results of tests of di erences in means to provide some descriptive evidence on whether these two types of entrepreneurs look di erent according to key indicators of performance and skills. As a second step, we estimate a logistic regression for the probability of being an opportunity entrepreneur on the same characteristics included in the descriptive analysis. This intends to provide additional evidence of the correlations between those characteristics and the dependent variables, when they are all included at once. The third step is to use discriminant analysis to nd the combination of variables that best distinguishes opportunity from necessity entrepreneurs. Finally, given that being an opportunity entrepreneur is potentially endogenous, we use and instrumental variable approach to estimate the e ect of this variable on the pro tability and management of the business.

3 Descriptive analysis

To compare entrepreneurs who report having opened their business out of opportunity and necessity in our full sample, Table 3 shows the means and the test for di erences in means, for our variables of business performance and characteristics, and cognitive and non-cognitive skills. Regarding business performance, mean weekly pro ts and sales are higher for opportunity than for necessity entrepreneurs and the di erence in means is statistically significant at any conventional level. Mean weekly sales per worker are also higher for opportunity entrepreneurs, but the di erence is not statistically signi cant, probably because, as shown below, those entrepreneurs have a signi cantly larger number of workers. Opportunity entrepreneurs also have a higher composite business practice score, compared to necessity ones, and the di erence is statistically signi cant. In conclusion, the opportunity entrepreneurs have both better performance and are manage their businesses signi cantly better. Regarding other characteristics of the business and the entrepreneur, As a second09(businrerepreneurs)]TJ 0 -204(elo1)-2

necessity entrepreneurs, opportunity ones also have higher mean cognitive skills, measured as standardized scores for the Raven and digit span recall tests, and 1.5 more years of schooling. as

of entrepreneurs, except for locus of control, which favors opportunity ones, willingness to take risks and self-satisfaction, which favor top necessity ones. In summary, comparing top necessity entrepreneurs with opportunity ones yields less pronounced di erences, and in some cases, such di erences suggest that top necessity entrepreneurs have better performance and skills than opportunity ones.

In Table 5, we compare the same sample of opportunity entrepreneurs with necessity ones in the bottom quartile of daily pro ts. As would be expected, the mean di erences obtained for the full sample in Table 3 are ampli ed and many of them become even more statistically signi cant. Opportunity entrepreneurs have higher mean pro ts and sales, have better cognitive and non-cognitive abilities, and have more years of education, compared to the bottom necessity ones.

Tables 3, 4, 5 show important di erences in the observable characteristics of opportunity and necessity entrepreneurs, but also suggest that some of this latter group might in fact have the potential for growing and becoming more successful. To measure the correlations between the characteristics in previous tables and the probability of opening a business out of opportunity, in Table 6 we report the results from logit regressions. We include as regressor the CBP score, the age of the business and the entrepreneur, their salary costs, their cognitive and non-cognitive skills. These regressions do not have causal interpretation, but allow us to look more closely at the mere correlations between the probability of being an opportunity entrepreneur and these variables, when all of them are included at once. We use all the observations of opportunity entrepreneurs for estimation in all columns and we vary the subsample of necessity ones. We include all necessity entrepreneurs in column 1; only the rst quartile of daily pro ts in column 2; only the second quartile in column 3 and so on.

Table 6 shows that, after controlling for characteristics of the business and the entrepreneur, the correlation of the management score with the probability of being an opportunity entrepreneur is always positive and statistically signi cant, except for the last column, where we compare opportunity entrepreneurs with the top necessity ones. This is consistent with the evidence for this variable in Table 4. The patterns for business characteristics somewhat resemble those for mean di erences in Tables 4 and 5. Opportunity is negatively correlated with the age of the entrepreneur and the monthly salary expenses, except for the two top quartiles of necessity, as is the age of business in three out of ve columns. Regarding

cognitive abilities, the Raven test score seems to have a negative, and sometimes statistically signi cant, correlation with opportunity, once other characteristics are included in the estimation, whereas the digit span recall test score has no signi cant correlation. The results for these variables di er from the patterns shown in the mean-di erence tables. Conversely, years of schooling has a positive and statistically signi cant correlation with opportunity in all columns. In the bottom panel of Table 6, most measures of non-cognitive skills seem to have no statistically signi cant correlation with opportunity. Some positive correlations are found for extraversion, locus of control self-satisfaction, and attitude towards growth; negative correlations are only found for the willingness to take risks in columns 4 and 5.

As mentioned before, to complement the descriptive analysis presented so far, we use discriminant analysis to nd the combination of variables that best distinguishes opportunity from necessity entrepreneurs, and then use the estimates to predict whether a given observation belongs to opportunity or necessity. Table 7 presents the results for our full sample of both necessity and opportunity entrepreneurs, and then for di erent quartiles of necessity ones as before. We also vary the set of characteristics that are used to separate entrepreneurs into di erent species. The last two columns of Table 7 show that, when including all the explanatory variables we have used in our descriptive analysis together, our model would classify 42 percent of the entrepreneurs as opportunity, whereas only 21 report themselves as being so (see Table 2). This is because some entrepreneurs who report themselves as necessity, are in fact more similar to opportunity ones, according to the discriminant analysis. In the second column of the rst panel, about 63 percent of necessity entrepreneurs are correctly classi ed as being so, which means that the remaining 37 percent \appear" like opportunity ones.

The second column of Table 7, from the second to the bottom panel, shows that 74 percent of necessity entrepreneurs in the bottom quartile of pro ts are correctly classi ed as being so by the discriminant technique, whereas only 49 percent are in the top quartile. In addition, the percentage of necessity entrepreneurs correctly classi ed as such decreases monotonically with the pro ts quartile. This con rms that, as shown in our previous descriptive analysis, high-performing necessity entrepreneurs are very similar to opportunity ones and when we include only the most pro table of them (top quartile of the pro ts distribution) about half are \look like" opportunity ones. Instead, when we include only the least pro table of them

only a 25 percent \look like" opportunity ones.

the entrepreneur discussed until now, we estimate the following linear regression:

$$y_i = \quad + \quad opportunity_i + \quad ^T X_{it} + \quad _i \qquad (1)$$

Where y_{it} represents a measure of performance {self-reported weekly pro ts and standardized CBP score. The variable *opportunity* is a dummy variable that takes the value of 1 when the female micro-entrepreneur self-reported that she started her business because (i) she wanted to become independent, (ii) because she had money and found a good business opportunity or (iii) because she wanted to practice her profession and 0 if she opened because she needed (see section 2, for further detail). The control variables used in this regression, X_{it}, contain the set of variables classi ed as (i) business practices (ii) characteristics of the business and the entrepreneur, (iii) cognitive skills, and (iv) non-cognitive skills. Robust standard errors are estimated for this equation.

Column 1 of Table 10 in the appendix shows that the opportunity measure presents a considerable and signi cant correlation with weekly pro ts, and this correlation is greater than any observable cognitive and non-cognitive skilled considered. Similar results are observed considering the standardized CBP score.

The opportunity measure is correlated with unobservable characteristics of the entrepreneur that encourages the individual to act whenever she observes an opportunity. Social networks or self-motivation are some examples for these unobservables. However, we want to consider the degree in which other circumstances unrelated to their individual treats and enhances a good opportunity a ect their rms performance in the future.

We instrument *opportunity* with the interaction between the years in which the entrepreneur opened her business and the GDP growth observed in the state and time (year) in which she opened it. Since our sample registers pro ts and management performance observed during 2014, our assumption is that GDP growth at time when the business was set up is exogenous to pro ts (and management performance) various years later and only in uences them through the choice of starting a business out of necessity or opportunity.

By using a two-stage least square (2SLS) estimation strategy we estimate the e ect of having a good opportunity when an individual opened a business on future performance,

isolating this effect from individual abilities or social conditions. The first stage of our 2SLS estimation can be represented in the following way:

$$opportunity_{is} = \quad + \quad GDPgrowth\_t_{0s} + \quad ^{T}X + \quad _{is} \tag{2}$$

where $GDPgrowth\_t_0$ represents the GDP growth observed in state s where the entrepreneur i lives and she decides to open her business at time t_0. Table 9 presents the first stage results. The instrument presents a strong correlation with the variable *opportunity*. Considering Equation 1 as the second stage of the regression we observed that the estimated parameters (presented in Column 2 Table 10) show that whenever there is a positive shock independent of the entrepreneurial traits the firm's performance is approximately 4.6 times better in terms of weekly profits. The coefficient of the 2SLS regression is significantly greater than the OLS estimated parameter, indicating that it is possible that *optimism* is measured with error. According to Column (3) of the same table this result is not robust when controlling for non-cognitive skills.

Analyzing the CBP score in Table 11 we can see that *opportunity* is a variable that positively affects the managerial skills. If we instrument the variable *opportunity* (see Column 2, Table 11) the estimates establish that managerial skills increase 3.3 times whenever there is a good economic opportunity that the entrepreneur faces in the environment. This result is robust even after controlling for cognitive and non-cognitive skills. In addition, this table shows that memory measured through the digit span test and non-cognitive skills as the inclination to take risk and be self-satisfy are important factors that determine managerial performance.

Factors that enhance good opportunities for individuals seem to be positively affecting profits and managerial skills independent of their personal traits. It is possible that considering the local average treatment effects (LATE), the women entrepreneurs that are responding to these economic conditions are the ones who are generating these considerable effects. However, these results show that economic conditions matter for future performance.

5 Conclusions

Entrepreneurship programs are increasingly common in many countries. Among these programs, those targeting female entrepreneurs are especially important given the emerging evidence that businesses led by women face speci c obstacles. However, a key nding of previous studies analyzing the characteristics of entrepreneurs is the substantial heterogeneity among them, even within narrowly de ned groups. Further, given the large number of micro-entrepreneurs in developing countries, a major challenge for policy makers is understanding the key drivers of such heterogeneity in order to improve the targeting and design of support programs.

Relying on a unique dataset covering a wide array of characteristics, including cognitive, non-cognitive skills and managerial practices, for 10,000 female entrepreneurs in Mexico, in this paper we focus on a speci c element di erentiating female entrepreneurs: being an opportunity versus a necessity one. We document signi cant di erences on many dimensions between these two groups, most importantly in terms of pro tability, management, cognitive and non-cognitive skills. At the same time, we show that within the group of *necessity* entrepreneurs, about a third of them look like *opportunity* ones, according to their observable characteristics. Given that the de nition of opportunity (necessity) entrepreneur is clearly endogenous, in addition to the descriptive analysis, we use an instrumental variable approach to identify the causal e ect of being opportunity versus necessity on pro tability and management performance. We instrument being an opportunity entrepreneur with the state GDP growth in the same year that her business was set up. Our results con rm that businesses led by opportunity entrepreneurs are signi cantly more pro table and better managed than those led by necessity ones.

These results have important implications for policy makers interested in developing successful programs for supporting female entrepreneurs. First, they suggest that, in general, entrepreneurs who started their business because of necessity are characterized by low profitability and weak management of their companies. For this type of entrepreneurs, programs helping them to improve their prospects for salaried employment may be more bene cial than keeping them in their self-employment status. However, our results also suggest that some entrepreneurs among necessity ones resemble their opportunity counterparts. Identifying this subgroup and targeting programs to them could certainly improve their pro tability. Finally,

our results suggest that facing a positive shock that a ects the probability of becoming an opportunity entrepreneur has long-lasting e ects in the rm performance.

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6 Appendix

Figure 1: Kernel density ln(daily pro ts) from Female Micro-Entrepreneur Survey vs ENAMIN

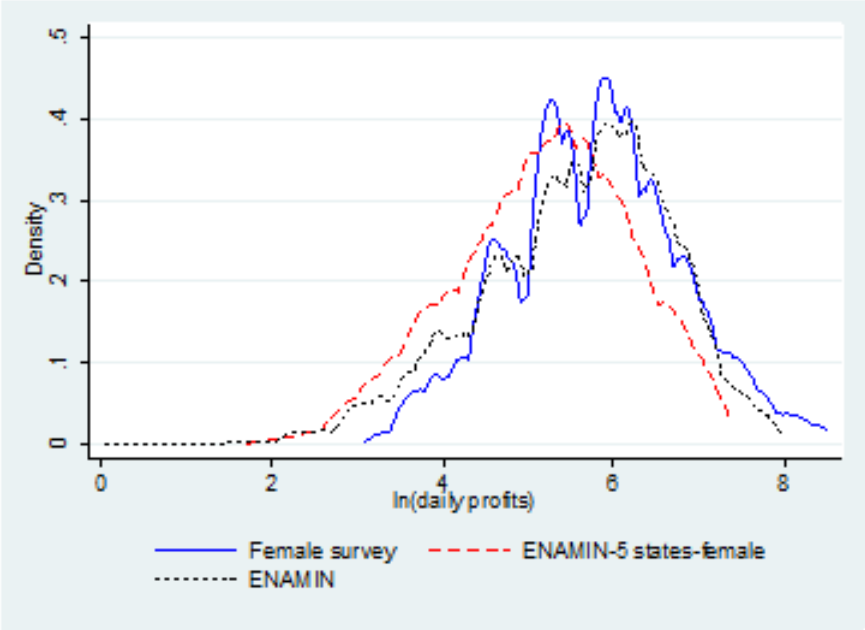

Figure 2: Distribution of weekly pro ts (log(x+1) transformation) by Opportunity/Necessity

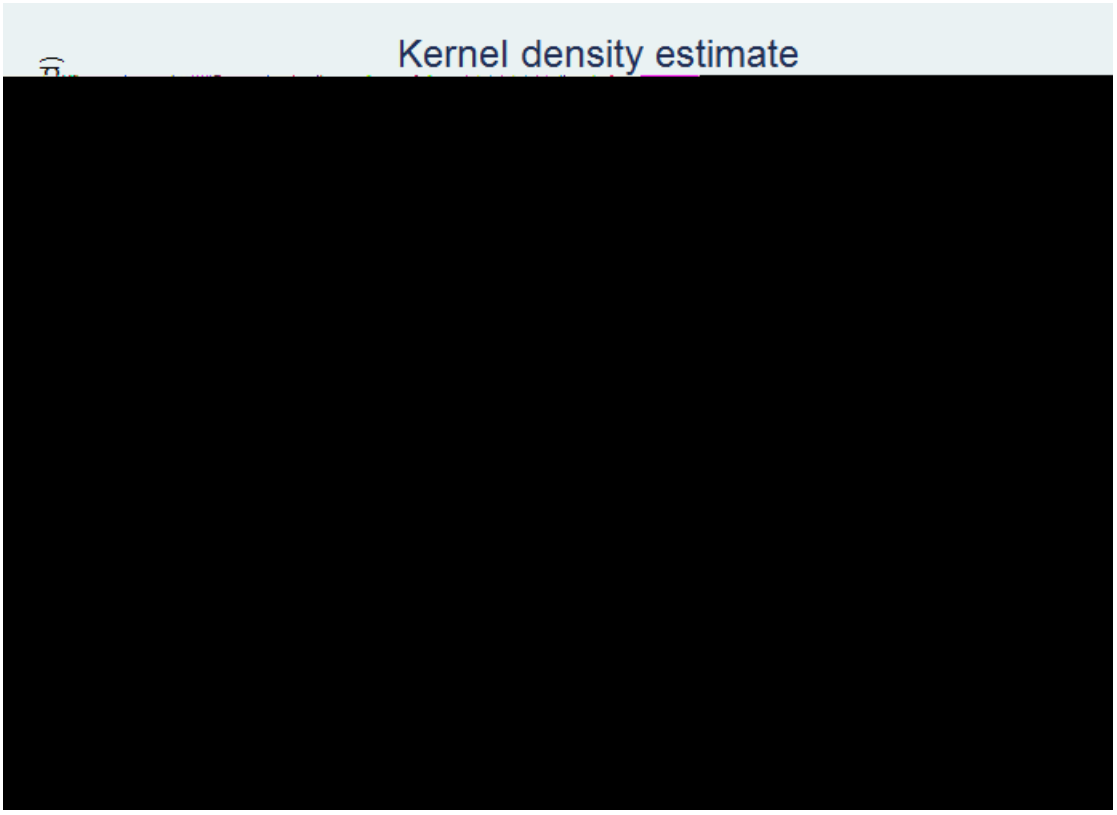

Table 1: Summary statistics

Total number of workers	1.356966	.7163669	1	5	1	1	2	10085
Age of business in months	110.6383	134.328	1	960	12	60	168	9939
Age of entrepreneur	45.3861	13.7923	12	90	35	45	55	10000
Growth expectation	.8865178	.3171972	0	1				10028
Access to nance[5]	.3500794	.4770183	0	1				10072
Reason to open the business								
Opportunity	.182945	.3866406						10085
Family	.0674269	.2507723						10085
Necessity	.6894398	.4627459						10085
Other	.0567179	.2313143						10085
Sector								
Retail	.6243927	.4843033						10085
Services	.3280119	.4695125						10085
Industry	.0466039	.2107993						10085
Cognitive skills								
Total score of raven test	-2.11e-09	1	-1.816711	2.604337	-.7114488	.0253924	.7622337	9576
Total score digit span test	-9.83e-09	1	-2.107748	3.05475	-.8171238	-.1718115	.4735008	9972
Years of schooling	8.579493	4.156668	0	18	6	9	12	9831
Principal component score of raven, digit span and schooling	9.92e-10	1	-2.812855	3.235296	-.7140867	-.0175605	.7073391	9327
Non-cognitive skills								
Big ve: Extraversion	-9.44e-09	1	-4.476956	2.949048	-.7639543	-.0213539	.7212464	10085
Big ve: Agreeableness	-8.56e-09	1	-5.34387	4.146494	-.5986881	-.1241699	.3503483	10085

[5] Dummy variable that equals one if the entrepreneur has nancial access

Table 3: Mean di erence test Opportunity vs Necessity (full sample)

	Opportunity group mean	Necessity group mean	p-value	
Measures of performance				
Weekly pro ts (self reported)	1937.635	1349.177	588.4576	1.26e-12
Weekly sales (self reported)	4507.258	3540.586	966.6726	1.31e-07
Weekly sales/workers	4395.353	4302.254	93.09963	.7776329
Composite Business Practice score (standarized)	.3060325	-.0842768	.3903093	1.29e-51
Business characteristics				
Age of entrepreneur	41.81658	45.92807	-4.111494	4.77e-31
Age of business in months	90.59086	103.6411	-13.05026	.0000466
Proportion with one worker or more	.3185	.2278	.0907	.0000
Costs:monthly salary expenses	1025.357	498.751	526.6064	5.84e-12
Cognitive skills				
Total score of raven test (standarized)	.0827833	-.0211648	.1039482	.0000841
Total score of digit span test (standarized)	.1459293	-.0328984	.1788277	5.72e-12
Years of schooling	9.789416	8.251668	1.537748	1.31e-45
Non-cognitive skills				
Extraversion (standarized)	-.0365413	.0155396	-.0520809	.0430861
Agreeableness (standarized)	-.0093652	.0075027	-.0168679	.5074504
Conscientousness (standarized)	-.069074	.0121551	-.0812292	.0015348
Neuroticism (standarized)	-.0246642	.0130341	-.0376982	.1432771
Intellect/imagination (standarized)	.0074094	-.0046432	.0120526	.635746
Self e cacy (standarized)	-.0957561	.0110521	-.1068082	.0000364
Locus of control (standarized)	.0954217	-.0202922	.1157139	8.77e-06
Impulsiveness (standarized)	.0480202	-.0170598	.06508	.0116913
Self con dence (standarized)	.1074716	-.0390423	.1465139	1.49e-08
Attitude towards risk (standarized)	.0975181	-.0298163	.1273345	1.44e-06
Self satisfaction (standarized)	.1163573	-.0443902	.1607475	7.42e-10
Optimism (standarized)	.138387	-.0400507	.1784377	1.21e-11
Attitude towards trust (standarized)	.0137271	-.0011845	.0149116	.5669594
Attitude towards growth (standarized)	.0621355	-.0119533	.0740888	.0046092
Observations	8949			

* $p < 0:1$, ** $p < 0:05$, *** $p < 0:01$

Table 4: Mean di erence test Opportunity group vs top 25% of daily pro ts for Necessity

	Opportunity group mean	Necessity group mean	Mean di erence	p-value
Measures of performance				
Weekly pro ts (self reported)	1937.635	3398.169	-1460.534	2.52e-20
Weekly sales (self reported)	4507.258	8898.376	-4391.117	7.84e-36
Weekly sales/workers	4395.353	7558.159	-3162.806	9.17e-11
Composite Business Practice score (standarized)	.3060325	.2559537	.0500788	.2083584
Business characteristics				
Age of entrepreneur	41.81658	43.3497	-1.533121	.0013669
Age of business in months	90.59086	111.8615	-21.27061	1.01e-06
Proportion with one worker or more	.3185935	.3748925	-.056299	0.0015
Costs:monthly salary expenses	1025.357	1451.622	-426.2651	.0036929
Cognitive skills				
Total score of raven test (standarized)	.0827833	.1619808	-.0791975	.0349545
Total score digit span test (standarized)	.1459293	.2135321	-.0676028	.0710074
Years of schooling	9.789416	9.161713	.627703	.000032
Non-cognitive skills				
Extraversion (standarized)	-.0365413	.0115596	-.0481008	.1928893
Agreeableness (standarized)	-.0093652	.0532649	-.0626301	.0945029
Conscientousness (standarized)	-.069074	-.0247944	-.0442796	.2394807
Neuroticism (standarized)	-.0246642	-.014709	-.0099552	.7927225
Intellect/imagination (standarized)	.0074094	.0346711	-.0272616	.4612176
Self e cacy (standarized)	-.0957561	-.0768504	-.0189057	.5912536
Locus of control (standarized)	.0954217	-.0688499	.1642716	.0000123
Impulsiveness (standarized)	.0480202	.1210343	-.0730141	.053711
Self con dence (standarized)	.1074716	.0689652	.0385064	.2954655
Attitude towards risk (standarized)	.0975181	.2431774	-.1456593	.0000417
Self satisfaction (standarized)	.1163573	.253991	-.1376337	.0001128
Optimism (standarized)	.138387	.1728365	-.0344495	.3096182
Attitude towards trust (standarized)	.0137271	.0287478	-.0150207	.6870126
Attitude towards growth (standarized)	.0621355	.0162987	.0458368	.2181091
Observations	3057			

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

Table 6: Logistic regression

	(1) Opportunity[6]	(2) Opportunity[7][8]	(3) Opportunity[9]	(4) Opportunity[10]	(5) Opportunity[11]
Measures of performance					
Composite Business Practice score (standarized)	0.286	0.557	0.338	0.208	0.0725
	[0.0340]	[0.0560]	[0.0461]	[0.0461]	[0.0476]
Business characteristics					
Age of entrepreneur	-0.0138	-0.0231	-0.0101	-0.00483	-0.00623
	[0.00288]	[0.00413]	[0.00378]	[0.00385]	[0.00421]
Age of business in months	-0.000203	0.00102	-0.0000397	-0.00113	-0.00124
	[0.000307]	[0.000437]	[0.000405]	[0.000401]	[0.000429]
Costs:monthly salary expenses	0.0000256	0.000407	0.000228	0.0000443	-0.0000367
	[0.0000101]	[0.0000681]	[0.0000370]	[0.0000189]	[0.0000131]

[6]Column (1) includes the full sample

[7]Column (2) includes all observations for which reason to open business is opportunity, and observations within the rst quartile of daily pro ts for which reason to open business is necessity

[8]Convergence was not achieved in this sample. The iterations were limited to 100 in order to obtain a result. Coe cients are similar to those obtained from a probit model where convergence was achieved.

[9]Column (3) includes all observations for which reason to open business is opportunity, and observations within the second quartile of daily pro ts for which reason to open business is necessity

[10]Column (4) includes all observations for which reason to open business is opportunity, and observations within the third quartile of daily pro ts for which reason to open business is necessity

[11]Column (5) includes all observations for which reason to open business is opportunity, and observations within the last quartile of daily pro ts for which reason to open business is necessity

Cognitive skills					
Total score of raven test (standarized)	-0.0703	-0.106	-0.0217	-0.0381	-0.145
	[0.0346]	[0.0523]	[0.0454]	[0.0466]	[0.0500]
Total score of digit span test (standarized)	0.00296	-0.0152	-0.0377	-0.0815	-0.0564
	[0.0366]	[0.0572]	[0.0486]	[0.0506]	[0.0516]
Years of schooling	0.0544	0.0716	0.0431	0.0762	0.0458
	[0.00928]	[0.0135]	[0.0121]	[0.0125]	[0.0134]
Non-cognitive skills					
Extraversion (standarized)	0.106	0.140	0.0618	0.105	0.0516
	[0.0342]	[0.0512]	[0.0456]	[0.0466]	[0.0497]
Agreeableness (standarized)	-0.00952	-0.00625	-0.0166	-0.0121	-0.0821
	[0.0339]	[0.0514]	[0.0449]	[0.0460]	[0.0491]
Conscientousness (standarized)	0.00429	-0.0132	0.00316	0.0164	-0.0405
	[0.0337]	[0.0519]	[0.0450]	[0.0464]	[0.0480]
Neuroticism (standarized)	-0.0187	-0.0346	-0.0168	-0.0225	-0.0143
	[0.0338]	[0.0503]	[0.0462]	[0.0464]	[0.0485]
Intellect/imagination (standarized)	-0.0442	-0.0796	-0.0486	-0.0383	-0.0278
	[0.0350]	[0.0526]	[0.0460]	[0.0470]	[0.0495]
Self e cacy (standarized)	0.0454	0.0492	0.0648	-0.0171	-0.0227
	[0.0369]	[0.0519]	[0.0477]	[0.0498]	[0.0536]
Locus of control (standarized)	0.0724	0.0213	0.0732	0.101	0.140

	[0.0324]	[0.0495]	[0.0430]	[0.0441]	[0.0470]
Impulsiveness (standarized)	0.0270	0.0411	0.0834	-0.0275	-0.0400
	[0.0330]	[0.0504]	[0.0434]	[0.0450]	[0.0471]
Self con dence (standarized)	0.0458	0.0718	0.0276	-0.00161	0.0886
	[0.0355]	[0.0532]	[0.0467]	[0.0485]	[0.0507]
Attitude towards risk (standarized)	-0.0367	0.0235	-0.0167	-0.161	-0.280
	[0.0364]	[0.0527]	[0.0475]	[0.0499]	[0.0544]
Self satisfaction (standarized)	0.0965	0.222	0.0470	0.0371	-0.0444
	[0.0398]	[0.0586]	[0.0520]	[0.0548]	[0.0575]
Optimism (standarized)	0.0245	0.0883	0.0157	-0.0622	-0.0671
	[0.0403]	[0.0562]	[0.0523]	[0.0561]	[0.0624]
Attitude towards trust (standarized)	0.0135	0.0361	0.0382	0.0446	-0.00871
	[0.0330]	[0.0478]	[0.0438]	[0.0437]	[0.0471]
Attitude towards growth (standarized)	0.0464	0.0346	0.102	0.0990	0.0788
	[0.0330]	[0.0502]	[0.0440]	[0.0451]	[0.0482]
Constant	-1.252	0.568	-0.0175	-0.175	0.539
	[0.167]	[0.248]	[0.219]	[0.225]	[0.246]
Observations	6281	2344	2574	2377	2154
Pseudo R^2	0.0477	0.1555	0.0719	0.0465	0.0376

Standard errors in brackets

* $p < 0:1$, ** $p < 0:05$, *** $p < 0:01$

Table 8: Mean di erence test Opportunity and Necessity vs Necessity incorrectly classi ed)

	Mean Opportunity	Mean Necessity	Mean Necessity incorrectly class.	Opp - Nec. incorrect	Nec - Nec. incorrect
Weekly pro ts (self reported)	1937.64	1349.18	1695.27	242.36	-476.57
Weekly sales (self reported)	4507.26	3540.59	4514.88	-7.62	-1335.31
Weekly sales/workers	-155.58	4302.25	4550.94	.7776	-305.79
Composite Business Practice score (standarized)	.3060	-.0843	.6524	-.3463	-.9997
Age of entrepreneur	41.82	45.93	38.00	3.81	10.76
Age of business in months	90.59	103.64	77.86	12.73	35.09
Costs:monthly salary expenses	1025.36	498.75	1012.41	12.95	-741.54
Total score of raven test	.0828	-.0212	.1169	-.0341	-.1907
Total score digit span test	.1459	-.0329	.2606	-.1146	-.3990
Years of schooling	9.7894	8.2517	11.1381	-1.3487	-3.9420
Extraversion (standarized)	-.0365	.0155	.0219	-.0698	-.0240
Agreeableness (standarized)	-.0094	.0075	-.0872	-.0312	-.0194
Conscientousness (standarized)	-.0691	.0121	-.0094	.0182	.1346
Neuroticism (standarized)	-.0247	.0130	.0112	-.0152	.0304
Intellect/imagination (standarized)	.0074	-.1451	.0121	-.0038	-.0214
Self e cacy (standarized)	-.0958	.0111	.1754	.0494	.2116
Locus of control (standarized)	.0954	-.0203	.1010	-.0710	-.2652
Impulsiveness (standarized)	.0480	-.0170	.2225	-.0529	-.1599
Self con dence (standarized)	.1075	-.0390	.1713	-.1150	-.3548
Attitude towards risk (standarized)	.0975	-.0298	.2962	-.0738	-.2767
Self satisfaction (standarized)	.1164	-.0444	.2612	-.1798	-.4639
Optimism (standarized)	.1384	-.0400	-.0131	-.1228	-.4133
Attitude towards trust (standarized)	.0137	-.0012	.0149	.0268	.0162
Attitude towards growth (standarized)	.0621	-.0120	.1491	-.0870	-.2188

Table 9: Results from rst stage of the 2SLS estimation strategy

	(1) Opportunity	(2) Opportunity
State growth rate	0.420	0.405
in year when business opened	[0.179]	[0.179]
Age of entrepreneur	-0.0024	-0.0026
	[0.000475]	[0.000498]
Raven test score (standarized)	-0.0125	-0.0116
	[0.00592]	[0.00620]
Digit span test score (standarized)	0.0093	0.00661
	[0.00631]	[0.00661]
Years of schooling	0.0122	0.0110
	[0.00154]	[0.00159]
Locus of control (standarized)		0.0113
		[0.00563]
Attitude towards risk (standarized)		-0.00237
		[0.00621]
Self satisfaction (standarized)		0.0126
		[0.00684]
Optimism (standarized)		0.0079
		[0.00659]
Constant	0.209	0.230
	[0.0299]	[0.0310]
Observations	5770	5383
R^2	0.028	0.030
F-statistic	34.28	19.28

Standard errors in brackets

* $p < 0{:}1$, ** $p < 0{:}05$, *** $p < 0{:}01$

Table 10: Weekly pro ts log(x+1) transformation (without top 1%)

	(1) Weekly pro ts (log(x+1) transformation)	(2) Weekly pro ts (log(x+1) transformation)	(3) Weekly pro ts (log(x+1) transformation)
Opportunity	0.231	4.636	3.492
	[0.0324]	[2.737]	[2.166]
Age of entrepreneur	-0.00399	0.00189	0.00109
	[0.00114]	[0.00733]	[0.00616]
Raven test score (standarized)	0.0266	0.114	0.0705
	[0.0138]	[0.0440]	[0.0349]
Digit span test score (standarized)	0.0894	0.113	0.106
	[0.0146]	[0.0345]	[0.0287]
Years of schooling	0.0107	-0.0290	-0.0173
	[0.00390]	[0.0325]	[0.0246]
Locus of control (standarized)	-0.0209		-0.0681
	[0.0127]		[0.0383]
Attitude towards risk (standarized)	0.0587		0.0764
	[0.0139]		[0.0275]
Self satisfaction (standarized)	0.159		0.143
	[0.0161]		[0.0310]
Optimism (standarized)	0.0313		0.0254
	[0.0159]		[0.0337]
CBP score (standarized)	0.134		
	[0.0140]		
Constant	6.623	5.809	5.994
	[0.0706]	[0.641]	[0.533]
Observations	6464	4813	4549
Model	OLS	IV	IV
F statistic from rst stage	.	25.61	14.37

Standard errors in brackets

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

Table 11: Composite Business Practice score

	(1) Composite Business Practice score (standarized)	(2) Composite Business Practice score (standarized)	(3) Composite Business Practice score (standarized)
Opportunity	0.251	3.258	2.897
	[0.0281]	[1.557]	[1.557]
Age of entrepreneur	-0.00265	0.00342	0.00429
	[0.000888]	[0.00423]	[0.00449]
Raven test score (standarized)	0.0146	0.0621	0.0379
	[0.0118]	[0.0291]	[0.0276]
Digit span test score (standarized)	0.0681	0.0573	0.0489
	[0.0122]	[0.0278]	[0.0251]
Years of schooling	0.0611	0.0228	0.0288
	[0.00306]	[0.0199]	[0.0180]
Locus of control (standarized)	0.00176		-0.0350
	[0.0110]		[0.0267]
Attitude towards risk (standarized)	0.112		0.129
	[0.0116]		[0.0213]
Self satisfaction (standarized)	0.0796		0.0655
	[0.0127]		[0.0311]
Optimism (standarized)	0.00457		-0.0404
	[0.0123]		[0.0259]
Constant	-0.448	-1.058	-1.064
	[0.0566]	[0.364]	[0.391]
Observations	7634	5770	5383
Model	OLS	IV	IV
F statistic from rst stage	.	34.28	19.28

Standard errors in brackets

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