Resources, experience and perseverance in entrepreneurs' perceived likelihood of success in an emerging economy

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This paper introduces new results obtained from a statistical investigation into a 3071-observation data set collected from a Vietnamese nationwide entrepreneurship survey. From established relationships, such factors as preparedness, financial resources and participation in social networks are confirmed to have significant effects on entrepreneurial decisions. Entrepreneurs, both financially constrained and unconstrained, who have a business plan tend to start their entrepreneurial ventures earlier. Also, financial constraints have a profound impact on the entrepreneurial decisions. When perceiving the likelihood of success to be high, an entrepreneur shows the tendency for prompt action on business ideas. But when seeing the risk of prolonging the waiting time to first revenue, a prospective entrepreneur would be more likely to wait for more favorable conditions despite the vagueness of "favorable".

Additionally, empirical computations indicate that there is a 41.3% probability that an extant entrepreneur who is generating revenue sees high chance of success. Past work and entrepreneurial experiences also have positive impacts on both the entrepreneurial decisions and perceived chance of success.

Keywords: Entrepreneurship, new venture, transitional economies

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Abstract:

This paper introduces new results obtained from a statistical investigation into a 3071-observation data set collected from a Vietnamese nationwide entrepreneurship survey. From established relationships, such factors as preparedness, financial resources and participation in social networks are confirmed to have significant effects on entrepreneurial decisions. Entrepreneurs, both financially constrained and unconstrained, who have a business plan tend to start their entrepreneurial ventures earlier. Also, financial constraints have a profound impact on the entrepreneurial decisions. When perceiving the likelihood of success to be high, an entrepreneur shows the tendency for prompt action on business ideas. But when seeing the risk of prolonging the waiting time to first revenue, a prospective entrepreneur would be more likely to wait for more favorable conditions despite the vagueness of "favorable". Additionally, empirical computations indicate that there is a 41.3% probability that an extant entrepreneur who is generating revenue sees high chance of success. Past work and entrepreneurial experiences also have positive impacts on both the entrepreneurial decisions and perceived chance of success.

1. Introduction

Entrepreneurship has been forming an integral part of the world's economy for hundreds of years now, and the process is described by Schumpeter (1934) as "a perennial gale of creative destruction". The

literature on entrepreneurship is very large and diverse, both on developed and developing economies. Nonetheless, empirical studies on entrepreneurship in emerging economy like Vietnam still fall short of demand as far as policy making and the public understanding are concerned.

This paper aims to communicate new empirical results from research on relationships between the critical factors of resources, work/entrepreneurial experiences, perseverance of Vietnamese entrepreneurs and the likelihood of success and decisions on their own entrepreneurial attempts, using a nationwide survey dataset containing over 3000 observations obtained in 2015.
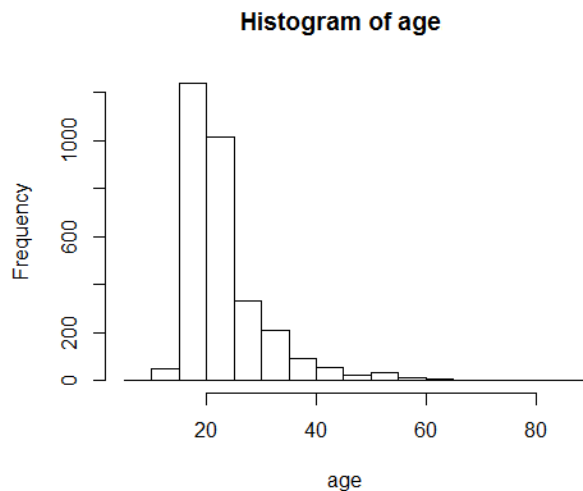
Histogram of age

Figure 1. Histogram of survey respondents' age

The paper has four main parts. It begins with a brief literature review examining key variables in subsequent modeling efforts. The next part presents relevant research questions and the statistical model employed in investigating them. Third, the paper describes the data set and analysis. The article closes with a discussion of key insights and implications.

2. A brief literature review

In this part, we discuss the necessity and emerging issues relating to our hypotheses, variables to be considered and analysis. The following presentation is divided into groups of issues and aspects that give rise to hypotheses and corresponding research questions.

The issues of entrepreneurs' preparedness, resources, social networks and perceived chance of survival:

Although the decision to become an entrepreneur requires an entrepreneurial self-efficacy construct, in line with Chen, Green & Crick (1998), the entrepreneurial experiences are oftentimes the harsh realities, and failures are almost unavoidable for novice (Bosma, Schutjens & Stam, 2009; Cope 2011; Vuong & Napier, 2014). Having learned from failures helps improve entrepreneurs' preparedness and confidence. Chen, Yao, & Kotha (2009) suggest that entrepreneurs do their 'homework' and do it well as this is perhaps the best way to persuade investors that the entrepreneurs are prepared and poised. The factor of preparedness is more complex than often thought about as at least three perspectives (namely, entrepreneurial, organizational, and ecological) have been identified in earlier discussions of

entrepreneurship theory (Van de Ven, Hudson & Schroeder, 1984). In addition, because an entrepreneurial self-efficacy construct consists of such factors as innovation, marketing, management, risk taking and financial controls, an entrepreneur's preparedness becomes more challenging than a mere self-confidence and personal motivation.

It is well known that capital and resources are critical to entrepreneurial decisions in the start-up phase. Family and relatives, friends and social networks' peers are an integral part of the game (Chang, Memili, Chrisman, Kellermanns, & Chua, 2009; Zahra, Hayton, Neubaum, Dibrell & Craig, 2008) as the social relationship offers further legitimacy to new venture (Meyer & Rowan, 1977; Hannan & Freeman, 1984; Nagy, Pollack, Rutherford, & Lohrke, 2012). The emerging trend of crowdfunding further emphasizes of the traditional factors (Brown, 1993; Mollick, 2014) most probably due the fact that entrepreneurs and new ventures will likely in need of presenting their credentials to gradually gain credibility (Hannan & Freeman, 1984). Credentials play very important roles in the process of granting resources in the early stages of the entrepreneurship (Hallen & Eisenhardt, 2012; Nagy et al., 2012; Vuong & Napier, 2014). In addition, the acquiring of resources for entrepreneurial endeavors has become even more complex because for entrepreneurs relationship development and resource exchange are a bidirectional process (Weerawardena & Mort, 2006; Huang & Knight, 2015).

Due to the difficulty of attaining optimal conditions for the above aspects of entrepreneurship, resilience is something desirable but hard to achieve for entrepreneurs (Sullivan-Taylor & Branicki, 2011); and entrepreneurship is even regarded as 'extreme' experience (Schindehutte, Morris & Allen, 2006). Although resources are critically important in constituting the overall strength of an entrepreneurial venture, the resource-acquiring game can become dangerous too. There is evidence demonstrating the effect of "destructive creation" where and when an overemphasis on resources is coupled with increasing costs of amassing resources and persistent lack of innovation capacity, leading a venture to constantly declining efficiency and finally financial distress (Vuong & Napier, 2014).

<u>Work and entrepreneurial experiences, perseverance and expected time lag to first revenue</u>

It is known that complication arises from the entrepreneurial process perceived as both increasing risks and unexpected challenges (Santos, Caetano & Curral, 2013; Huang & Knight, 2015). Therefore entrepreneurial experience and self-efficacy becomes critical for an entrepreneur to improve both risk appetite and skills to implement his/her entrepreneurship plan (Hallak, Lindsay & Brown, 2011). In the age of complex technological innovations and rising competition, the time taken to first sale tends to be lengthened due to complex process (Schoonhoven, Eisenhardt & Lyman, 1990). Thus, stronger commitment is required (Zahra, Hayton, Neubaum, Dibrell & Craig, 2008).

While passion plays a limited role in shaping investor decision-making (Chen et al., 2009) perseverance of entrepreneurs has become a determining factor, and it is not easy to maintain perseverance due to rising pressure of work-life experiences and lack of coping strategies (Jennings & McDougald, 2007; Santos, Caetano & Curral, 2013). Unfortunately, perseverance and self-efficacy are not costless (Markman, Baron & Balkin, 2005). Westhead, Ucbasaran & Wright (2009) provide empirical evidence on habitual entrepreneurs' capability of identifying more business opportunities than the novice, thanks in part to higher information search intensity.

Brush, Edelman & Manolova (2008) argue that assembling different types of resources is closely related to the likelihood of first sale. However higher aspiration of resources is not necessarily associated with achievement of sales, but rather related to ambitions (Bosma et al., 2009). The determining of early

strategic tasks thus becomes both difficult and critical while not many entrepreneurs believe in the value of their "homework" such as preparing a best available business plan (Davidsson, 2006; Vuong & Napier, 2015). Even the value of formation of entrepreneurial teams - which is key to sustained growth - is not obvious (Vyakarnam, Jacobs & Handelberg, 1999).

According Wagner (2007), 'nascent' entrepreneurship is even more elusive as "less is known about precisely what nascent entrepreneurs are doing and about the timing of the activities". That is why early planning is so important (Dimov, 2010; Vuong & Napier, 2015). In Dimov's (2010) evidence from the Panel Study of Entrepreneurial Dynamics (PSED) data, both entrepreneurial experience and early planning have indirect effects on venture emergence. In an earlier empirical study, Kessler & Frank (2009) look into the "influencing dimensions" (the entrepreneur; resources; the environment; and, the process) to have confirmed the strongest influence of past experience and process, which are closely connected to skills and perseverance, on the success.

The brief review of the literature on entrepreneurship helps to: i) learn about the relevance of factors that enter our subsequent analysis of survey data; ii) explore possible relationships and directions of impacts on determination of entrepreneurial pursuits and chance of success / survival; and, iii) have an idea about which factors should be emphasized in an emerging economy context. These considerations are reflected in the next statement of research questions.

3. Research questions and analytical framework

Research questions:
RQ1: How entrepreneurs' preparedness (e.g., having a business plan), financial resource limitation, and participation in social networks of entrepreneurs impact their decisions in making entrepreneurial attempts?

RQ2: Do self-perceived likelihood of business survival/success and expected time to the first revenue generation affect entrepreneurial decision on creating a business?

RQ3: How do past work experiences and past entrepreneurial attempts impact entrepreneurs' expectation of their waiting time to the first revenue?

RQ4: What are the joint impacts of resources, past entrepreneurial attempts and perseverance on self-assessment of time to the first revenue for entrepreneurs with financial constraints. Is there any difference between those with and without financial constraints?

The BCL method:
Our investigation of the likely effects of the predictor (independent) variables on entrepreneurship outcomes employs the analytical framework of baseline-category logits (BCL). The BCL modeling with a full description of its technical treatments are provided in Agresti (2013). Below, we present key ideas of the framework and the way impacts of independent variables on responses are investigated.

The BCL method is estimated as a multivariate generalized linear model (GLM) taking the form:
$$g(\mu_i) = X_i\beta,$$
where, $\mu_i = E(Y_i)$, corresponding to $y_i = (y_{i1}, y_{i2}, \dots)'$; row h of the model matrix X_i for observation i contains values of independent variables for y_{ih}.

Following this method, as $\pi_j(\mathbf{x}) = P(Y = j|\mathbf{x})$ represent a fixed setting for predictor variables, with $\sum_j \pi_j(\mathbf{x}) = 1$, count data are distributed over J categories of Y as multinomial with corresponding probabilities $\{\pi_1(\mathbf{x}), \dots, \pi_j(\mathbf{x})\}$. The BCL model aligns each response (dependent) variable with a baseline category: $\ln[\boldsymbol{\pi}_j(\mathbf{x})/\boldsymbol{\pi}_J(\mathbf{x})]$, with $j = 1, \dots, J - 1$.

As $\ln[\boldsymbol{\pi}_a(\mathbf{x})/\boldsymbol{\pi}_b(\mathbf{x})] = \ln[\boldsymbol{\pi}_a(\mathbf{x})/\boldsymbol{\pi}_J(\mathbf{x})] - \ln[\boldsymbol{\pi}_b(\mathbf{x})/\boldsymbol{\pi}_J(\mathbf{x})]$, the set of response probabilities from multinomial logits $\{\boldsymbol{\pi}_j(\mathbf{x})\}$, can be computed from the formula:

$$\boldsymbol{\pi}_j(\mathbf{x}) = \frac{\exp{(\alpha_j + \beta_j^{\mathrm{T}}\mathbf{x})}}{1 + \sum_h^{J-1} \exp{(\alpha_h + \beta_h^{\mathrm{T}}\mathbf{x})}}.$$

The categorical variables reflecting the nature of our survey data are both dichotomous (e.g., the variable of the entrepreneur's perseverance for this entrepreneurial attempt "tforstart" takes value of "g24" or "less24") and multinomial, for example: factor "tot1strev" representing the time lag to the first revenue from business conduct, which takes values of "now" (currently generating revenues), "soon" (expecting to generate revenues within 12 months) or "notsure" (uncertain about future date when revenues are generated. Their coded names and values are described in the corresponding data set in the data section. A relevant example of actual applications of the BCL modeling with survey data is given in Vuong (2015).

4. Data, estimations and results

4.1. Data
The survey was conducted through a series of entrepreneurs' meetings that were organized in five economic centers in Vietnam (Hanoi, Ho Chi Minh City, Da Nang, Buon Ma Thuot, Can Tho) by the Vietnamese Federation of the Youth and Students, Trung Nguyen Coffee Group, the Center for Business Study and Assistance under a joint initiative on youth entrepreneurship. Entrepreneur participants who were willing to join the survey were explained about the purpose and how to complete the questionnaire given by authorized personnel. Answers were collected at the end of the each event. Fig. 2 below describes the overall response to questions about entrepreneurs' anticipated capital mobilization and expected revenue (all in logarithmic scale).
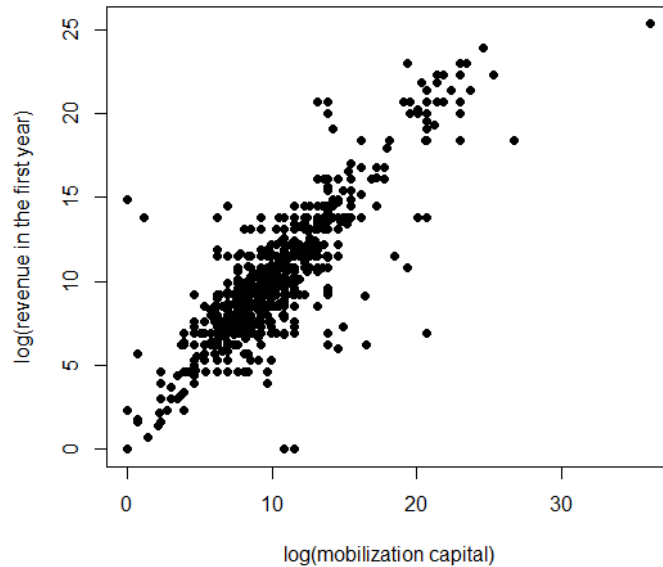
Figure 2. Highly possible relationship between anticipated capital consumption and revenues

Among the estimated number of 50,000 entrepreneurs attended these events. The survey team randomly approached about 10,000 during the survey period, from March to May 2015, and were able to collect a random data sample containing 3071 observations, representing answers in full or in part. In our subsequent analysis, each data set requires a specific structure reflected through the corresponding tabulated form, with the number of observations used varying depending upon appropriate treatments for missing data (for partial answers). The data are categorical by both research nature and design, with Fig. 3 presenting the count data of responses to the question about which source of finance the entrepreneur counts on.
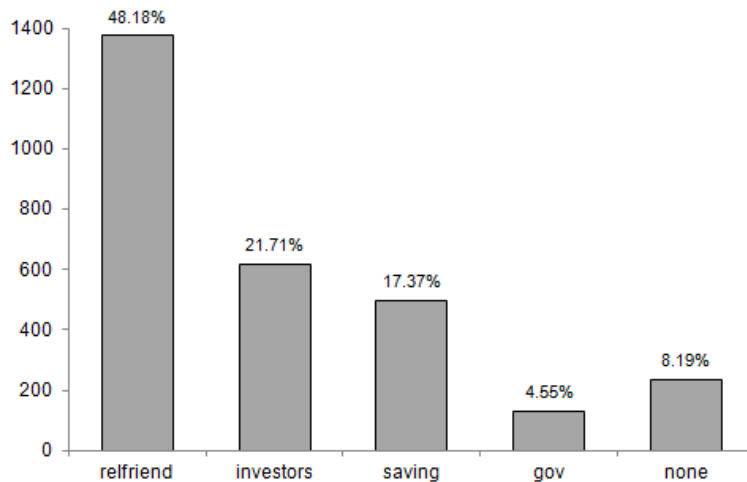

Figure 3. An indication of key source of finance for Vietnamese entrepreneurs

Data for RQ1:
For this first data set, N=2524.

Factors	Categories	Remarks
"member"	• "no" • "yes"	Independent dichotomous variables.
"plan"	• "noneed" • "inprocess" • "basic" • "good"	Independent polytomous variables. The variables take one of these four categorical values, of which: "noneed" is when an entrepreneur does not think he/she would need a business plan; "inprocess": a business plan for their venture is being prepared; "basic": a basic plan is available; and "good": the entrepreneur has a well prepared plan for his venture.
"finance"	• "noshort" • "shortage"	Independent dichotomous variable that indicates if the entrepreneur faces financial constraint ("shortage") or not ("noshort").
"startplan"	• "a" • "b" • "c" • "d"	Dependent polytomous variables, which capture responses if the entrepreneur is currently operating a venture ("a"); starting soon ("b"); only starting upon favorable socioeconomic conditions ("c"); or, no starting any business ("d").

Out of 2524 observations, 1047 face issues of financial constraints (~41.48%); and 1477 do not think they face financial shortage ("noshort").

Table 1 (Data for RQ1). Distribution of entrepreneurs following factors of social network membership, having a business plan, facing financial shortage and decision on entrepreneurial attempt

"member"	"plan"	"finance"	"startplan"			
			"a"	"b"	"c"	"d"
"no"	"basic"	"noshort"	17	62	89	36
		"shortage"	14	26	50	13
	"good"	"noshort"	15	13	15	8
		"shortage"	11	10	15	8
	"inprocess"	"noshort"	16	50	261	80
		"shortage"	10	46	191	35
	"noneed"	"noshort"	4	16	60	64
		"shortage"	2	2	45	24
"yes"	"basic"	"noshort"	37	80	92	22
		"shortage"	27	43	70	7
	"good"	"noshort"	48	38	22	8
		"shortage"	44	37	35	9
	"inprocess"	"noshort"	24	62	155	30
		"shortage"	17	54	164	17
	"noneed"	"noshort"	5	7	23	18
		"shortage"	0	3	15	3

The largest portion of entrepreneurs, about 52%, are those who only act upon favorable socioeconomic conditions (1302/2524).

Data for RQ2:

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The dependent (response) variables for this RQ2 are having the same meaning as described in data for RQ1. The other factors are as follows.

Factors	Categories	Remarks
"chance"	• "high" • "med" • "low"	Independent multinomial variables that reflect self-reported chance of success / survival of the entrepreneur, having categorical values of "high" (>80%); "med" (50-80%); and low (<50%).
"tot1strev"	• "now" • "soon" • "notsure"	Independent polytomous variables that capture estimated waiting time to the first revenue for venture, having categorical value of: "now" (currently generating business revenues); "soon" (is going to generate revenues within the next 12 months); and, "notsure" (uncertain about the capability of revenue generation).

The second data set has N=2739, and its tabulated form is given in Table 2.

Table 2 (Data for RQ2). Distribution of entrepreneurs following factors of chance of survival, time to the first revenue, and entrepreneurial decision.

"tot1strev"	"chance"	"startplan"			
		"a"	"b"	"c"	"d"
"now"	"high"	70	33	47	15
	"low"	12	8	11	4
	"med"	55	37	70	18
"soon"	"high"	69	149	199	41
	"low"	18	34	78	21
	"med"	87	258	402	67
"notsure"	"high"	6	43	186	65
	"low"	4	14	107	58
	"med"	7	39	323	84

About 52% of respondents expect to be able to generate the first revenue dollar within the next 12 months (1423/2739).

Data for RQ3:
For RQ3, the response variables are "tot1strev" as described in data for RQ2. Two other factors entering the estimations are "job" and "starthis", explained below.

Factors	Categories	Remarks
"job"	• "none" • "admin" • "hrm" • "fin" • "pom" • "salesm"	Independent multinomial variables that indicate past work experiences: "admin" (general administrative); "hrm" (human resources management); "fin" (finance/accounting); "pom" (production and operations management); "salesm" (sales and marketing functions); and, "none" (no previous work experience).
"starthis"	• "running" • "dropped" • "notyet"	Independent multinomial variables that tell whether the entrepreneur is running an entrepreneurial firm ("running"); used to operate some venture ("dropped"); or has never ever started/operated an entrepreneurial venture ("notyet").

This set has N=2722, provided in Table 3. About 28% of the extant/prospective entrepreneurs report to have not had previous work experience (753/2722).

Table 3 (Data for RQ3). Distribution of entrepreneurs following factors of past work experience, past entrepreneurial attempt, and time taken to the first business revenue

"job"	"starthis"	"tot1strev"		
		"now"	"soon"	"notsure"
"admin"	"dropped"	13	154	115
	"notyet"	10	96	108
	"running"	27	48	18
"finance"	"dropped"	12	55	24
	"notyet"	2	33	16
	"running"	32	36	9
"hrm"	"dropped"	9	52	16
	"notyet"	6	31	18
	"running"	31	37	2
"none"	"dropped"	9	149	159
	"notyet"	8	138	232
	"running"	18	29	11
"pom"	"dropped"	10	78	26
	"notyet"	7	36	12
	"running"	55	71	5
"salesm"	"dropped"	25	179	96
	"notyet"	12	66	57
	"running"	92	114	18

It is noteworthy that 232/753 respondents do not have either work or entrepreneurial experiences in the past and they are uncertain about when their business ventures will be able to generate a first revenue.

Data for RQ4:
For RQ4, the response variables are the same "tot1strev" as described in data for RQ2 and RQ3. Other factors are described below.

Factors	Categories	Remarks
"mres"	• "none" • "saving" • "relfriends" • "gov" • "investors"	Independent multinomial variables that indicate past work experiences: "admin" (general administrative); "hrm" (human resources management); "fin" (finance/accounting); "pom" (production and operations management); "salesm" (sales and marketing functions); and, "none" (no previous work experience).
"tforstart"	• "g24" • "less24"	Independent dichotomous variables that indicates entrepreneur's perseverance with his/her commitment to this entrepreneurial attempt: on a long-term basis ("g24"); or shot-term ("less24").

Using the financial constraints factor as control variate, table 4 provides a data subset for 1044 (of N=2722) with financial constraints.

Table 4 (Data for RQ4). Distribution of financially constrained entrepreneurs following factors of perseverance, resources and time taken to the first business revenue

"tforstart"	"mres"	"tot1strev"		
		"now"	"soon"	"notsure"
"g24"	"gov"	1	15	16
	"investors"	19	91	42
	"none"	4	16	37
	"relfriends"	46	185	160
	"saving"	29	47	43
"less24"	"gov"	4	11	4
	"investors"	9	37	8
	"none"	1	5	7
	"relfriends"	40	92	32
	"saving"	8	26	9

Among the subset of 1044, 751 report that they will be highly committed to their entrepreneurial firms. Of these, 185 assess that they will receive resources from relatives/friends and their firms are likely to generate revenues within the next 12 months. Likewise, Appendix A provides the data subset for those without financial constraints.

4.2. Estimations and results

Estimations and results for RQ1:
Most of estimated coefficients are statistically significant at conventional level, and 15/18 are highly significant with p<0.01. Details of estimations are provided in Table 5. The general trend shows that "wait-and-see " mentality appears to have been predominant in the society.

Table 5. Estimation results for RQ1

	intercept	"plan"			"finance"	"member"
		"basic"	"good"	"inprocess"	"shortage"	"yes"
	β_0	β_1	β_2	β_3	β_4	β_5
logit(a|d)	-2.755***	2.200***	3.059***	1.210***	0.335 .	1.228***
	[-8.390]	[6.186]	[8.044]	[3.443]	[1.934]	[6.901]
logit(b|d)	-1.712***	2.130***	2.039***	1.470***	0.329*	0.959***
	[-7.729]	[8.406]	[6.813]	[6.157]	[2.236]	[6.518]
logit(c|d)	-0.026	0.952***	0.412 .	1.173***	0.562***	0.534***
	[-0.191]	[5.199]	[1.664]	[7.519]	[4.404]	[4.111]
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, z-value in square brackets; baseline category for: "plan": "noneed"; "finance": "noshort"; and, "member": "no". Residual deviance: 24.81 on 30 degrees of freedom.						

The single largest coefficient in Table 5 is β_2=3.059 (p<0.0001), supporting the idea that having a good business plan increases the chance of an entrepreneur currently operating an entrepreneurial firm. The following relationships (RQ1.1-1.3) are derived from Table 5.

$\ln\left(\dfrac{\pi_a}{\pi_d}\right) = -2.755 + 2.200 \times \text{basicPlan} + 3.059 \times \text{goodPlan} + 1.210 \times \text{inprPlan} + 0.335$ $\times \text{shortFin} + 1.228 \times \text{yesMember}$	Eq. (RQ1.1)
$\ln\left(\dfrac{\pi_b}{\pi_d}\right) = -1.712 + 2.130 \times \text{basicPlan} + 2.039 \times \text{goodPlan} + 1.470 \times \text{inprPlan} + 0.329$ $\times \text{shortFin} + 0.959 \times \text{yesMember}$	Eq. (RQ1.2)
$\ln\left(\dfrac{\pi_c}{\pi_d}\right) = -0.026 + 0.952 \times \text{basicPlan} + 0.412 \times \text{goodPlan} + 1.173 \times \text{inprPlan} + 0.562$ $\times \text{shortFin} + 0.534 \times \text{yesMember}$	Eq. (RQ1.3)

Reading equation (RQ1.3) gives an understanding that having no business plan (i.e., unpreparedness) the entrepreneur tends to wait for "favorable conditions" to decide a start of his/her venture. In fact, β_3=1.173 (p<0.0001) is the largest in the equation indicates that having no plan is the most influential factor for the decision of waiting for better conditions. From these relationship, Table 6 provides computed empirical probabilities of entrepreneurship decisions based on financial conditions and preparedness.

Table 6. Probability distributions of entrepreneurial decision over preparedness, financial constraints and participations in social networks

"startplan"	"running" (a)				"soon" (b)			
"member"	"yes"		"no"		"yes"		"no"	
"plan"|"finance"	"shortage"	"noshort"	"shortage"	"noshort"	"shortage"	"noshort"	"shortage"	"noshort"
"basic"	0.163	0.175	0.096	0.102	0.328	0.353	0.253	0.270
"good"	0.383	0.394	0.256	0.260	0.298	0.308	0.260	0.266
"inprocess"	0.071	0.080	0.038	0.041	0.199	0.224	0.138	0.153
"noneed"	0.062	0.065	0.029	0.029	0.134	0.141	0.082	0.081
"startplan"	"only with favorable conditions" (c)				"not to start" (d)			
"member"	"yes"		"no"		"yes"		"no"	
"plan"|"finance"	"shortage"	"noshort"	"shortage"	"noshort"	"shortage"	"noshort"	"shortage"	"noshort"
"basic"	0.450	0.383	0.531	0.449	0.059	0.089	0.120	0.179
"good"	0.260	0.213	0.349	0.282	0.059	0.085	0.135	0.192
"inprocess"	0.659	0.587	0.698	0.612	0.071	0.109	0.126	0.194
"noneed"	0.598	0.496	0.561	0.439	0.206	0.298	0.328	0.451

Examples of computing a specific probability of Table 6 is given in Appendix B(a). Reading a cell of Table is as follows. Take Table 6(c), $a_{12} = 0.383$, indicates that the probability of a financially constrained entrepreneur currently operating a venture is still high, if that person has a high degree of preparedness (with good business plan) and actively participate in social networks of entrepreneurs. Fig. 4 shows impacts of preparedness and financial constraints on entrepreneurial decisions for those actively participating in social networks of entrepreneurs, using data from Appendix C.
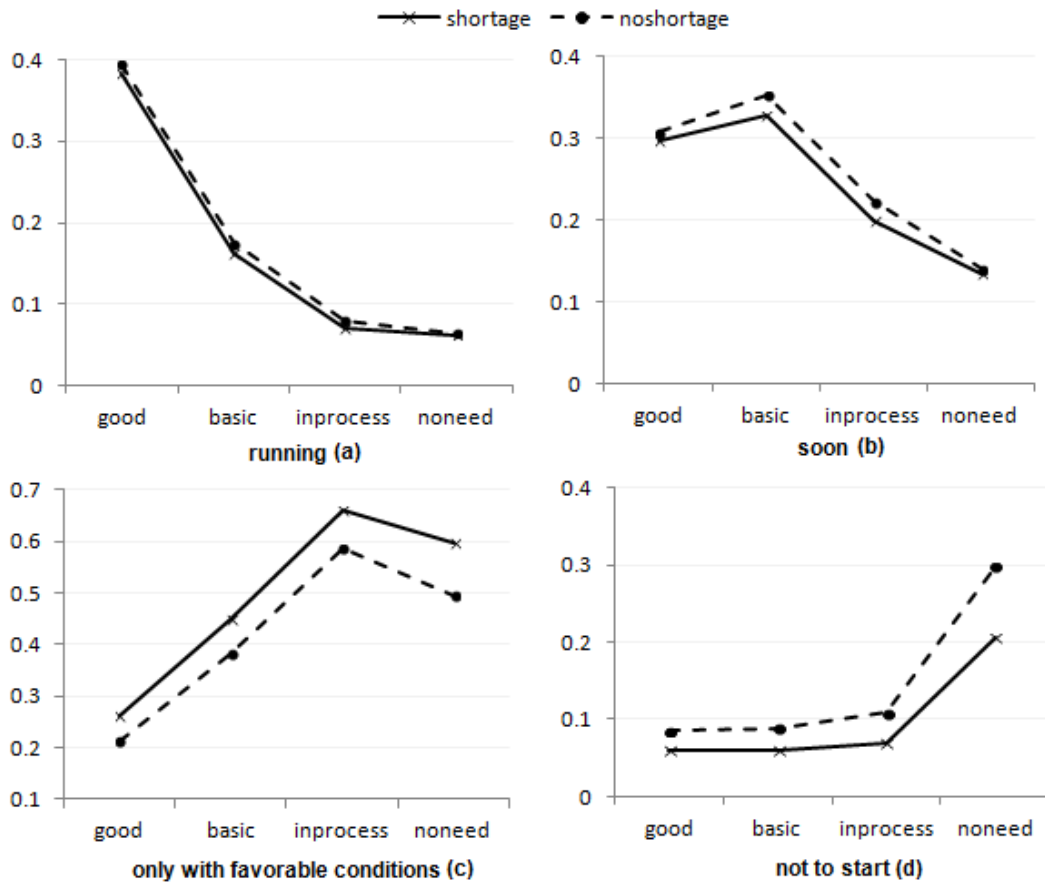
Figure 4. Changing probabilities of start decisions following business plan preparedness and financial constraints (control variate: active membership in social networks)

Estimations and results for RQ2:

Estimating the data set for RQ yields results provided in Appendix D. In the similar way to RQ1 in the preceding discussion, Table report empirical probabilities conditional upon factors the estimated time to the first revenue and chance of success.

Table 7. Probability distributions of decisions over time to the first revenue and chance of success

"startplan"	"running" (a)			"soon" (b)			"only with favorable conditions" (c)			"not to start" (d)		
"tot1strev"| "chance"	"low"	"med"	"high"	"low"	"med"	"high"	"low"	"med"	"high"	"low"	"med"	"high"
"now"	0.349	0.315	0.413	0.157	0.211	0.209	0.340	0.381	0.288	0.154	0.093	0.090
"soon"	0.125	0.105	0.152	0.245	0.307	0.336	0.485	0.506	0.424	0.145	0.082	0.088
"notsure"	0.016	0.015	0.024	0.074	0.102	0.122	0.606	0.695	0.635	0.304	0.188	0.219

Also in this investigation, Fig. 5 using data provided in Appendix E presents two trends of probabilities of start decisions for the entrepreneurs who estimate a high chance of success / survival.
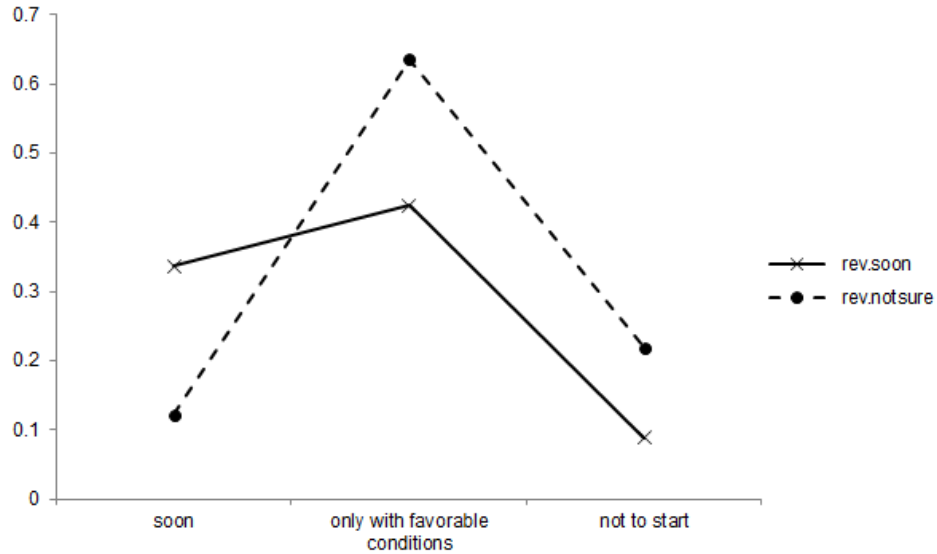
Figure 5. Probabilistic trends for entrepreneurs following their decisions, controlling for (un)certainty of the first revenue timing.

Fig. 5 indicates that those who face uncertainty of the first revenue tend to wait or abandon their entrepreneurial attempts. In contrary, those who see high chance of obtaining the first revenue within the next 12 months are more likely to decide to start earlier.

Estimations and results for RQ3:
Estimated coefficients and corresponding statistics are reported in Table 8, with all being showing statistical significance at conventional levels (p<0.1).

Table 8. Estimations for RQ3

	Intercept	"job"					"starthis"	
		"admin"	"finance"	"hrm"	"pom"	"salesm"	"dropped"	"running"
	β_0	β_1	β_2	β_3	β_4	β_5	β_6	β_7
logit(now|notsure)	-3.074*** [-14.090]	0.565* [2.268]	1.639*** [5.576]	2.035*** [6.646]	2.033*** [7.212]	1.401*** [6.131]	0.362 . [1.782]	3.181*** [14.629]
logit(soon|notsure)	-0.504*** [-5.655]	0.356** [3.044]	0.937*** [4.955]	1.256*** [6.040]	1.400*** [7.379]	0.731*** [5.897]	0.406*** [4.247]	1.454*** [9.159]

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. z-value in square brackets. Baseline category for "job": "none"; and "starthis": "notyet". Residual deviance: 15.38 on 20 d.f.

Both past work experiences and previous entrepreneurial attempts have influence to the time lag to the first revenue. Specifically, their empirical relationships are given in Eqs. (RQ3.1-2), drawn upon coefficients from Table 8.

$\ln\left(\dfrac{\pi_{\text{now}}}{\pi_{\text{notsure}}}\right) = -3.074 + 0.565 \times \text{admin} + 1.639 \times \text{finance} + 2.035 \times \text{hrm} + 2.033 \times \text{pom} + 1.401$ $\times \text{salesm} + 0.362 \times \text{dropped} + 3.181 \times \text{running}$	Eq. (RQ3.1)
$\ln\left(\dfrac{\pi_{\text{soon}}}{\pi_{\text{notsure}}}\right) = -0.504 + 0.356 \times \text{admin} + 0.937 \times \text{finance} + 1.256 \times \text{hrm} + 1.400 \times \text{pom} + 0.731$ $\times \text{salesm} + 0.406 \times \text{dropped} + 1.454 \times \text{running}$	Eq. (RQ3.2)

From Eq. (RQ3.2), the fact that coefficient for "running" with $\beta_7=1.454$ (p<0.0001) is telling: only entrepreneurs currently operating a venture can be more realistic and confident about their chance of generating revenues within the next 12 months. Also, from Eqs.(RQ3.1-3.2), empirical probabilities are computed and provided in Table 9.

Table 9. Probabilities of time to the first revenue following past work and entrepreneurial experiences

"tot1strev"	"now" (a)			"soon" (b)			"notsure" (c)		
"starthis"| "job"	"running"	"dropped"	"notyet"	"running"	"dropped"	"notyet"	"running"	"dropped"	"notyet"
"admin"	0.294	0.048	0.042	0.555	0.537	0.444	0.151	0.415	0.514
"finance"	0.430	0.094	0.086	0.495	0.633	0.555	0.075	0.273	0.359
"hrm"	0.458	0.108	0.102	0.488	0.679	0.610	0.054	0.213	0.288
"pom"	0.425	0.098	0.093	0.525	0.709	0.644	0.050	0.193	0.263
"salesm"	0.415	0.085	0.077	0.493	0.597	0.514	0.092	0.318	0.409
"none"	0.237	0.034	0.028	0.550	0.460	0.366	0.213	0.506	0.606

Estimations and results for RQ4:
Table 10 provides estimated impacts of resources/supports, perseverance on the time required to the first revenue, for financially constrained entrepreneurs.

Table 10. Estimation results for RQ4 controlling for financially constrained ("shortage")

	Intercept	"tforstart"	"mres"			
		"g24"	"gov"	"investors"	"relfriends"	"saving"
	β_0	β_1	β_2	β_3	β_4	β_5
logit(now|notsure)	-1.277[*] [-2.545]	-1.146[***] [-5.259]	0.610 [0.878]	1.573[**] [2.956]	1.296[**] [2.626]	1.802[***] [3.443]
logit(soon|notsure)	-0.030 [-0.101]	-0.879[***] [-5.108]	0.872[*] [2.152]	1.664[***] [5.248]	1.052[***] [3.692]	1.056[**] [3.246]
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. z-value in square brackets. Baseline category for "tforstart": "less24"; and "mres": "none". Residual deviance: 9.41 on 8 d.f.						

In these estimations, both factors of resources and perseverance have significant influence. They are better interpreted with relationships reflected by Eqs. (RQ4.1-4.2), and then computed probabilities showing relationships among the time taken for having the first revenue and entrepreneurs' perseverance and types of resources (Table 11).

$\ln\left(\dfrac{\pi_{\text{now}}}{\pi_{\text{notsure}}}\right) = -1.277 - 1.146 \times \text{g24Tstart} + 0.610 \times \text{gov} + 1.573 \times \text{investors} + 1.296$ $\times \text{relfriend} + 1.802 \times \text{saving}$	Eq. (RQ4.1)
$\ln\left(\dfrac{\pi_{\text{soon}}}{\pi_{\text{notsure}}}\right) = -0.030 - 0.879 \times \text{g24Tstart} + 0.872 \times \text{gov} + 1.664 \times \text{investors} + 1.052$ $\times \text{relfriend} + 1.056 \times \text{saving}$	Eq. (RQ4.2)

Table 11. Probabilities of the time for the first revenue against perseverance and types of resources; controlling for the financially constrained

"tot1strev"	"now" (a)		"soon" (b)		"notsure" (c)	
"mres"|"tforstart"	"g24"	"less24"	"g24"	"less24"	"g24"	"less24"
"gov"	0.077	0.134	0.453	0.605	0.470	0.261
"investors"	0.120	0.180	0.598	0.686	0.282	0.134
"relfriends"	0.131	0.212	0.466	0.579	0.403	0.209
"saving"	0.199	0.308	0.430	0.509	0.371	0.183
"none"	0.059	0.124	0.270	0.431	0.671	0.445

In addition, using computed values in Appendix G Fig. 6 presents impacts of perseverance and types of resources for those financially constrained.
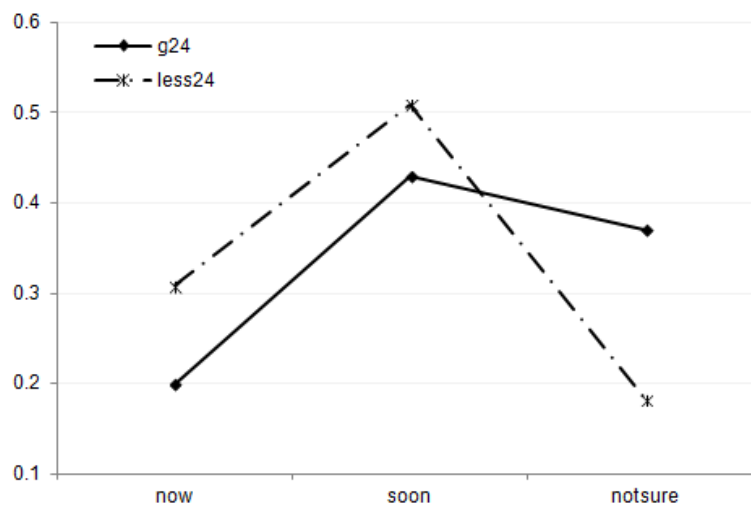

Figure 6. Probability distributions for event "time lag to the first revenue" for the financially constrained using personal saving as main type of resource for the entrepreneurial endeavor

For those without financial constraints, detailed computations are presented in Appendix H. Conditional probabilities following Appendix H are in Table 12 below.

Table 12. Probabilities of the time take to the first revenue conditional on types of resource and perseverance; controlling for the financially unconstrained ("noshort")

"tot1strev"	"now" (a)		"soon" (b)		"notsure" (c)	
"mres"|"tforstart"	"g24"	"less24"	"g24"	"less24"	"g24"	"less24"
"gov"	0.156	0.145	0.464	0.707	0.380	0.148
"investors"	0.115	0.092	0.630	0.823	0.255	0.085
"relfriends"	0.125	0.125	0.421	0.686	0.454	0.189
"saving"	0.187	0.178	0.427	0.667	0.386	0.155
"none"	0.091	0.112	0.280	0.564	0.629	0.324

Comparing probabilities from Table 11(a) and 12(a) shows that the financially unconstrained tend to take advantage of government resources better than the financially constrained. Fig. 7 also gives trends for

comparing the financially constrained and unconstrained for other types of resource, except from the government (details in Appendix I).
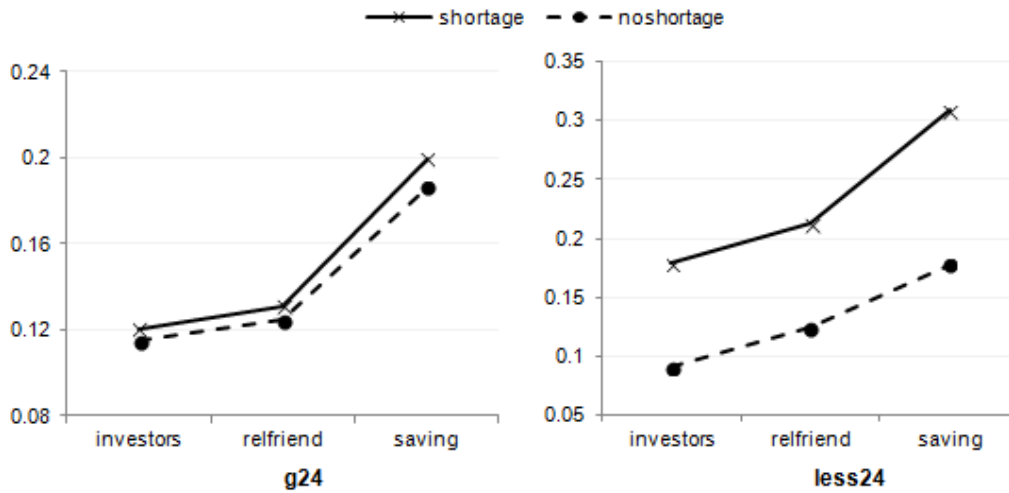

Figure 7. Probabilistic trends for entrepreneurs with and without financial constraints, controlling for degree of perseverance

5. Conclusions

In this final part, we offer some key insights learned from the reported results.

The matter of time:
In line with results from RQ1, such factors as preparedness, availability of financial resources and participation in social networks of entrepreneurs all have significant effects on entrepreneurial decision, especially as far as concrete timing is concerned. Although there are plenty of "ideas" shared and discussed within the community, it is not obvious for one to reach the decision of pursuing a business venture. That's why sharing knowledge and plan with an entrepreneurs' community has the effect of strengthening the ideation of one's entrepreneurial endeavor, thus contributes to reducing the empirical probabilities of "waiting for favorable conditions" - a vague perception that usually hinders the actual entrepreneurial undertaking.

Entrepreneurs with better business plans show the trend of starting earlier, and the trend holds for both the financially constrained and unconstrained. It is interesting to see the differences in predominant trends among groups of entrepreneurs: a) those with good plans also tend to be operating a venture (Fig.1a); b) those with basic plans is planning to start a venture shortly (Fig 1b); c) those without a plan tends to wait for better conditions to decide (Fig. 4c); and, d) those who do not believe in the value of a business plan are less likely to pursue a real-world venture (Fig.1d).

Financial constraints have a profound impact on the entrepreneurial decisions. For prospective entrepreneurs (who are not running an entrepreneurial venture), availability of finance become a determining factor in increasing the probabilities of the decision to start soon and not to start for both those financially constrained and unconstrained. The difference between the two groups of the constrained and unconstrained can be seen clearly only when looking at the "wait-and-see" factor, in which case financial shortage tends to increase the probabilities of waiting.

Chance of success:
Studying RQ2 with Table 7a shows a higher perceived likelihood of success tends to prompt a prospective entrepreneur to act on his ideas. In addition, one assesses that the time taken to generate the first revenue from business is longer, one would likely delay his decision making process to see if "favorable" conditions emerge and improve one's chance. Also, empirical computations indicate that there is a 41.3% probability that an extant entrepreneur who is generating revenue sees high chance of success (Table 7, following computations demonstrated in Appendix Bb). This is not obvious as when and how to make money in the real world continue to be an elusive factor for many extant and prospective entrepreneurs. Still results obtained from the investigation of RQ1 suggest that the "wait and see" mentality dominates the entrepreneurs community as empirical probabilities indicate that even in the cohort of entrepreneurs who see higher chance of success / survival for their entrepreneurial endeavors with expectation of generating revenues within 12 months from the start, they are more likely to wait for "favorable conditions" than to start a venture.

Money matters:
In studying RQ3, the relationship between past work experience and past entrepreneurial attempt is confirmed by results in Table 9. The highest probability found in the table is 70.9% representing the chance of obtaining the first revenue in a short time span for those who used to make past entrepreneurial efforts, having work experiences in the area of production and operations management (for an example of actual computations, see Appendix B(c)).

The likelihood of making money in short time span for those without work experience or non-business related experiences such as pure admin work is found to be low (see Table 9), especially if they have not attempted to pursue a business or dropped their plans.

Overall, work and entrepreneurship experiences have been important to the chance of making early money, which in turns influence the decisiveness of entrepreneurs to start his/her venture, as indicated by results of RQ1. Prospective entrepreneurs who pursue their endeavors based on wishful thinking, without professional knowledge, skills and entrepreneurship experiences, would likely face much higher uncertainty of revenue and finally find it less motivated to start. Those who pursue despite all these signs of disadvantages do so at their perils.

The financially constrained vs. unconstrained:
This consideration RQ4 connects empirical observations in previous findings to learn about differences in assessment of the time to the first revenue for two groups characterized by degree of financial constraints. The results indicate that both perseverance and types of resource have significant impacts on the time lag to the first business revenue, with the resource from saving being the most influential for those who currently have business revenue ($\beta_5=1.802$; $p<0.001$). This is line with Harrison's idea about the core value of progressive cultures where saving is the mother of future investments and financial sustainability. In addition, for those who expect to generate revenues soon enough (within 12 months) resources from investors and bankers have the strongest influence ($\beta_3=1.664$; $p<0.001$).

Also, results from Table 11 suggest that it is impossible to replace the required resources for doing business with time and perseverance without adversely affecting the efficiency of generating revenues (in terms of time). It is because the financially constrained show a low probability of making early money, roughly 6% (based on computation provided in Appendix B9b)).

Strikingly, Fig. 6 tells another interesting result. First the financially constrained appear to have started earlier and shown higher chance of obtaining business revenues from their venture. Second, in case the financially constrained do not expect early revenues, they tend to exercise better perseverance than the unconstrained.

Competing interests: The authors declare that they have no competing interests.

Authors' contributions: QHV designed the survey, organized the research team, coordinated the data collecting program. QHV, THD, TTV prepared, process and analyzed the data. QHV interpreted the results and wrote the paper. All the authors read and approved the final manuscript.

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APPENDIXES

Appendix A. (Data for RQ4). Distribution of the financially unconstrained against perseverance, types of resources and time lag to the first business revenue.

"tforstart"	"mres"	"tot1strev"		
		"now"	"soon"	"notsure"
"g24"	"gov"	6	26	21
	"investors"	24	143	60
	"none"	11	31	62
	"relfriends"	65	218	239
	"saving"	41	85	77
"less24"	"gov"	5	12	2

"investors"	14	107	9
"none"	0	6	8
"relfriends"	22	121	31
"saving"	9	47	12

Appendix B. Examples of empirical probabilities provided in this study.

Table	Place	Actual computations
6(a)	a_{21}	$\pi_a = \dfrac{e^{(-2.755+3.059+0.335+1.228)}}{1 + e^{(-2.755+3.059+0.335+1.228)} + e^{(-1.712+2.039+0.329+0.959)} + e^{(-0.026+0.412+0.562+0.534)}} = 0.383$
7(a)	a_{13}	$\pi_a = \dfrac{e^{(-2.219+3.742)}}{1 + e^{(-2.219+3.742)} + e^{(-0.593+1.436)} + e^{(1.060+0.104)}} = 0.413$
9(b)	a_{42}	$\pi_{soon} = \dfrac{e^{(-3.074+2.033+0.362)}}{1 + e^{(-3.074+2.033+0.362)} + e^{(-0.504+1.400+0.406)}} = 0.709$
11(a)	a_{51}	$\pi_{now} = \dfrac{e^{(-1.277-1.146)}}{1 + e^{(-1.277-1.146)} + e^{(-0.030-0.879)}} = 0.059$

Appendix C. Probabilities of entrepreneurial decisions following preparedness and financial resources of those active in social networks.

"startplan"	"running"		"soon"		"only with favorable conditions"		"not to start"	
"plan"| "finance"	"shortage"	"noshortage"	"shortage"	"noshortage"	"shortage"	"noshortage"	"shortage"	"noshortage"
"basic"	0.163	0.175	0.328	0.353	0.45	0.383	0.672	0.647
"good"	0.383	0.394	0.298	0.308	0.26	0.213	0.702	0.692
"inprocess"	0.071	0.08	0.199	0.224	0.659	0.587	0.801	0.776
"noneed"	0.062	0.065	0.134	0.141	0.598	0.496	0.866	0.859

Appendix D. Estimating impacts of perceived chance of success and time lag to the first business revenue on entrepreneurial decisions.

	Intercept	"tot1strev"		"chance"	
		"now"	"soon"	"low"	"med"
	β_0	β_1	β_2	β_4	β_5
logit(a|d)	-2.219[***] [-8.131]	3.742[***] [11.918]	2.770[***] [9.940]	-0.706[**] [-2.778]	-0.305. [-1.734]
logit(b|d)	-0.593[***] [-3.814]	1.436[***] [6.085]	1.937[***] [12.095]	-0.823[***] [-3.832]	-0.025 [-0.161]
logit(c|d)	1.060[***] [9.001]	0.104 [0.508]	0.514[***] [4.065]	-0.371[*] [-2.207]	0.244. [1.822]
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. z-value in square brackets. Baseline category for "tot1strev": "notsure"; and "chance": "high". Residual deviance: 6.639 on 12 d.f.					

Stylized relationships derived from the preceding estimation results:

$\ln\left(\dfrac{\pi_a}{\pi_d}\right) = -2.219 + 3.742 \times \text{nowRev} + 2.770 \times \text{soonRev} - 0.706 \times \text{lowChance} - 0.305 \times \text{medChance}$	Eq. (RQ2.1)
$\ln\left(\dfrac{\pi_b}{\pi_d}\right) = -0.593 + 1.436 \times \text{nowRev} + 1.937 \times \text{soonRev} - 0.823 \times \text{lowChance} - 0.025 \times \text{medChance}$	Eq. (RQ2.2)

$\ln\left(\dfrac{\pi_c}{\pi_d}\right) = 1.060 + 0.104 \times \text{nowRev} + 0.514 \times \text{soonRev} - 0.371 \times \text{lowChance} + 0.244$ $\times \text{medChance}$	Eq. (RQ2.3)

Appendix E. Probabilities of entrepreneurial decisions following estimated time lag to the first revenue for those with reported higher chance of success / survival.

"tot1strev"	"startplan"		
	"soon"	"only with favorable conditions"	"not to start"
"soon"	0.336	0.424	0.088
"notsure"	0.122	0.635	0.219

Appendix F. Probabilities of time lag to the first revenue following past entrepreneurial attempts for those with previous finance/accounting experience.

"starthis"	"tot1strev"		
	"now"	"soon"	"notsure"
"running"	0.415	0.493	0.092
"dropped"	0.085	0.597	0.317
"notyet"	0.077	0.514	0.409

Appendix G. Probabilities of time lag to the first revenue following perseverance for the financially constrained, based on type of resource "saving".

"tforstart"	"tot1strev"		
	"now"	"soon"	"notsure"
"g24"	0.199	0.430	0.371
"less24"	0.308	0.509	0.182

Appendix H. Estimating impacts of resource types, perseverance on the time lag to the first revenue for the financially unconstrained.

	Intercept	"tforstart"	"mres"			
		"g24"	"gov"	"investors"	"relfriends"	"saving"
	β_0	β_1	β_2	β_3	β_4	β_5
logit(now|notsure)	-1.069**	-0.868***	1.042*	1.139**	0.648 .	1.209**
	[-2.841]	[-4.054]	[2.120]	[2.964]	[1.860]	[3.259]
logit(soon|notsure)	0.551*	-1.362***	1.008**	1.715***	0.734**	0.909***
	[2.213]	[-8.698]	[2.945]	[6.846]	[3.272]	[3.619]
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. z-value in square brackets. Baseline category for "tforstart": "less24"; and "mres": "none". Residual deviance: 11.64 on 8 d.f.						

Empirical relationships:

$\ln\left(\dfrac{\pi_{\text{now}}}{\pi_{\text{notsure}}}\right) = -1.069 - 0.868 \times \text{g24Tstart} + 1.042 \times \text{gov} + 1.139 \times \text{investors} + 0.648$ $\times \text{relfriend} + 1.209 \times \text{saving}$	Eq. (RQ4.3)
$\ln\left(\dfrac{\pi_{\text{soon}}}{\pi_{\text{notsure}}}\right) = 0.551 - 1.362 \times \text{g24Tstart} + 1.008 \times \text{gov} + 1.715 \times \text{investors} + 0.734 \times \text{relfriend}$ $+ 0.909 \times \text{saving}$	Eq. (RQ4.4)

Appendix I. Probabilities of currently generating revenues the financially constrained ("shortage") and unconstrained ("noshort") on other resource types than government.

"tforstart"	"g24"		"less24"	
"mres"|"finance"	"shortage"	"noshortage"	"shortage"	"noshortage"
"investors"	0.120	0.115	0.180	0.092
"relfriends"	0.131	0.125	0.212	0.125
"saving"	0.199	0.187	0.308	0.178