

Determinants of Entrepreneurial Survival

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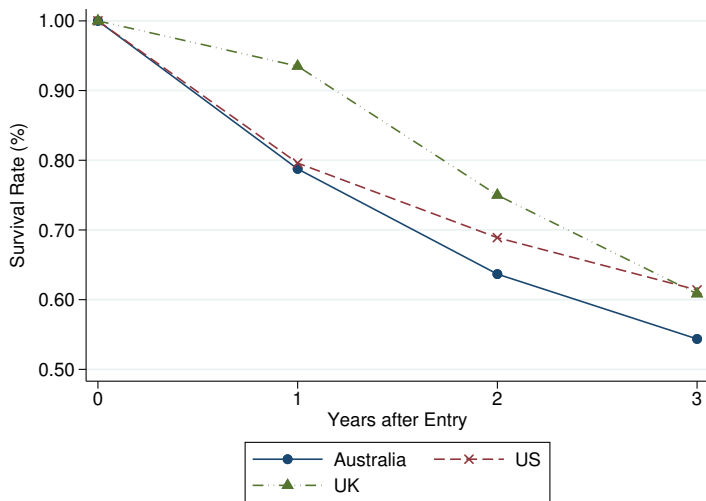
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Why look at entrepreneurship?

- Entrepreneurship commonly viewed as a major driver of economic growth, job creation, and competitiveness (Parker, 2009).
 - ▶ Common viewpoint among academics and policy makers.
- Multiple entrepreneurial programmes introduced:-
 - ▶ US Small Business Administration
 - ★ Budget of \$US 831.8 million (FY 2017)
 - ▶ Australia's Entrepreneurial Programme
 - ★ Budget of \$AUD 120 million (FY 2017)
 - ▶ EU Entrepreneurship 2020 Action Plan

An issue: High nascent business dissolution rate



Business survival rate born on 2013. Data for Australia from ABS (2017), for the United States from Bureau of Labor Statistics (2017), and for the United Kingdom from ONS (2017)

The entrepreneurs are self-employed

- Self-employment is an easy & practical measurement of entrepreneurship (Katz, 1990).
- But the self-employed includes:-
 - ▶ those who contribute to the job-generation process (*Employer* self-employed)
 - ▶ Those who work on their own (*Solo* self-employed)
- *Employer* self-employed likely to represent clear cases of genuine entrepreneurship (Earle & Sakova, 2000).
- Focus on examining the survival of *employer* self-employed.

The *employer* & *solo* self-employed

- The *employer* self-employed
 - ▶ An (un)incorporated business owner with at least 1 non-founder employee.
 - ▶ e.g Owner manager of a restaurant & a founder of a startup company.
- The *solo* self-employed
 - ▶ An (un)incorporated business owner with no employees.
 - ▶ e.g. Freelancers & independent contractors.
 - ▶ Note: The solo self-employed can also be part of a partnership. Just that they have no other employees working for them on a regular basis.

The mechanism behind entrepreneurial exit/survival

- At the start of each period, an entrepreneur chooses to exit if entrepreneurial income is lower than a performance threshold.
- Income is positively determined by the individual's inherent & unobservable ability to be an entrepreneur (Lucas, 1978; Jovanovic, 1982).
- Entrepreneurs can only form prior expectations of this ability with some entrepreneurs having more dispersed priors than others.
 - ▶ Early exit is likely for entrepreneurs with dispersed priors, especially after experiencing negative shocks.
- Past experiences can help inform prospective entrepreneurs of their ability priors (Baptista et al., 2014).
- Accumulated skills/abilities, relevant to entrepreneurship, can concentrate ability priors for the entrepreneur.

Previous Empirical Studies

- Education overwhelmingly has a positive outcome on self-employment duration (Sluis & Praag, 2008; Millan et al., 2012).
- Working experience positively impacts self-employment duration (Brüderl et al., 1992; Carrasco, 1999; Cressy, 1999; Taylor, 1999; van Praag, 2003; Georgellis et al., 2007; Millán et al., 2012).
 - ▶ Previous self-employment experience
 - ▶ Managerial/Occupation experience
 - ▶ Industry specific experience
 - ▶ General working experience

What's missing

- Previous studies on self-employment survival did not make the distinction between *solo* and *employer* self-employment.
 - ▶ Except for 2 studies by Millán et al. (2014).
- What are the skills involved in these past experiences?
 - ▶ Different experiences likely teach different skills/abilities.
 - ▶ e.g. The skills needed to work satisfactory as a restaurant manager is different compared to the skills needed to work as a multinational executive.
- Research Questions:
 - ▶ What are the skills that an entrepreneur can acquire from their previous employment?
 - ▶ Which of these skills are important for entrepreneurial survival?

HILDA - Household, Income & Labour Dynamics in Australia

- Using all 16 waves (2001-2016) from the HILDA survey dataset.
- First & only nationally representative longitudinal study of Australian households.
- Annually collects information on:
 - ▶ Economic and subjective well-being
 - ▶ Family dynamics
 - ▶ **Labour market dynamics**

from all members (aged 15+ years) of an initial sample of households selected in 2001 and a top-up sample selected in 2011.

HILDA - Identifying the *employers* and their previous occupation

- In each wave, every member of the sampled households are administered a Person Questionnaire.
- The questionnaire asks respondents "*[Do/Did] you work in your own business with employees?*"
 - ▶ If a respondent replies **yes**, they are classified as ***employers***
 - ▶ Focus on people who became *employers* between their first and last observed interview HILDA.
 - ▶ Identified 1,244 *employership* spells that began between years 2001 & 2016.
- HILDA also records the respondents' occupation title in each yearly interview.
 - ▶ Use this to derive the employers' occupation prior employership entry.
 - ▶ **Issue:** HILDA does not tell us anything about the skills involved in the employers' previous occupation.

O*NET OnLine- Characterizing the occupations

- Use the **O*NET** database to **define** and **rate** the skills associated with the employers' previous occupation.
 - ▶ Contains up to date information on standardized descriptions on almost 1,000 occupations in the US economy.
- Focus on recognizing the **cognitive abilities**; **basic skills**; and **cross-functional skills** associated with each occupation.
- Skills and abilities rated based on 'importance'.
- Extracted **56** different skills/abilities (and their 'importance' ratings) for **967** different occupations.

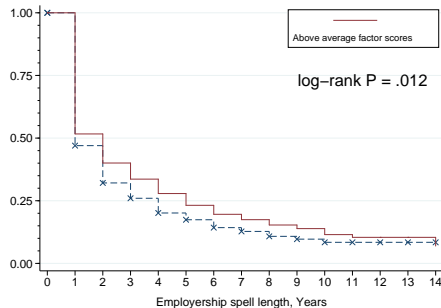
Use factor analysis to reduce 56 skills/abilities to fewer latent variables

- **Issue** - 56 traits is unwieldy.
 - ▶ Multicollinearity issues due to patterns of correlation between occupation skills.
 - ▶ e.g. *Judgement & decision making* skills can be considered similar or related to *critical thinking* skills.
- Use factor analysis to reduce observable variables to fewer **factors** that share a common variance.
 - ▶ e.g. *Judgement & decision making* and *critical thinking* skills can be assigned to a cognitive factor.
- For each occupation from the O*NET database, predict the scores for each factor derived.
- Match the occupation factor scores to HILDA reported occupation titles.

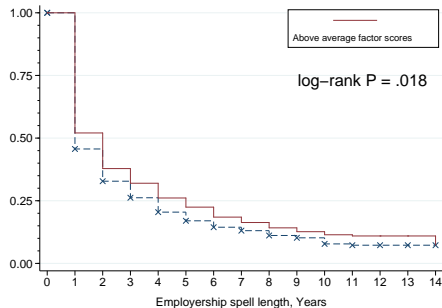
Reduced 56 skills/abilities to 5 relevant occupation factors.

- Cognitive Factor
 - ▶ e.g. Active Learning & Critical Thinking
- Technical Specialization Factor
 - ▶ e.g. Equipment Maintenance & Repairing
- Mathematics Factor
 - ▶ e.g. Mathematical Reasoning & Number Facility
- Resource Management Factor
 - ▶ e.g. Coordination & Management of Material Resources
- Pattern Recognition Factor
 - ▶ e.g. Perceptual Speed & Selective Attention

Skills matter for survival

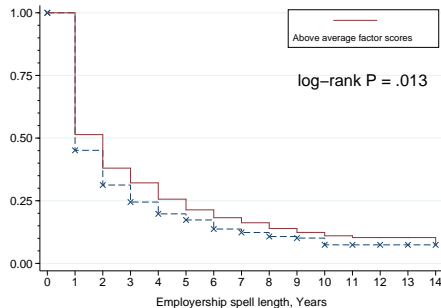


(a) Cognitive factor (Previous occupation)

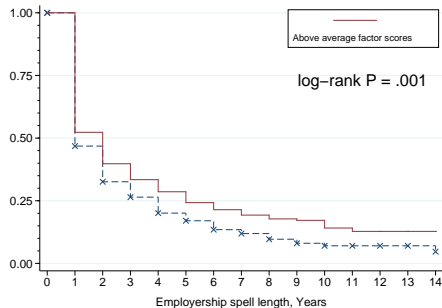


(b) Mathematics factor (Previous occupation)

Skills matter for survival

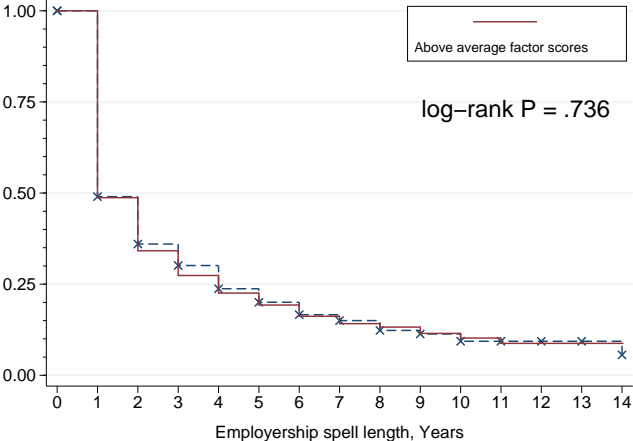


(a) Resource management factor
(Previous occupation)



(b) Pattern Recognition factor
(Previous occupation)

Except for *Tech. Specialization*



Technical specialization factor (Previous occupation)

Discrete Survival Analysis - complementary log-log link

- The continuous time hazard of the *employment* spell could be represented by a proportional hazard specification:-

$$\theta(t) = \theta_0(t) \exp [\beta' \mathbf{X}(i)]$$

where $\theta_0(t)$ is a baseline hazard at time t ; $\mathbf{X}(i)$ is the employers' explanatory and control characteristics.

- But duration data available in HILDA is interval-censored. Survival times fall within some interval a_{j-1} and a_j .
- Estimate the discrete-time proportional hazards model with a complementary log-log link

$$\begin{aligned}\theta(a_j | \mathbf{X}) &= \text{prob}(a_{j-1} < T < a_j | T \geq a_{j-1}) \\ &= 1 - \exp \left\{ - \exp [\beta' \mathbf{X}(i) + \gamma_0(j)] \right\}\end{aligned}$$

where

$$\gamma_0(j) = \ln \left\{ - \ln [1 - \theta_0(a_j)] \right\} = \ln \left\{ \Theta_0(a_j) - \Theta_0(a_{j-1}) \right\}$$

$$\Theta_0(a_j) = \int_0^{a_j} \theta_0(u) du$$

Explanatory variables for use in analysis

- The factor score ratings of the employers' previous occupation prior entry:-
 - ▶ Cognitive
 - ▶ Tech. specialization
 - ▶ Resource management
 - ▶ Mathematics
 - ▶ Pattern recognition
- Years of paid working experience.
- Years spent with previous employer/business in the same industry as *employership*.
- Highest level of education achieved dummy variables:-
 - ▶ Completed Year 12
 - ▶ Certificate
 - ▶ Diploma
 - ▶ Bachelor degree or higher
 - ▶ Base category: Completed Year 11 or lower

Control variables for use in analysis

- No. of employees at firm
- Gender
- Urban area indicator
- Age
- Marital status
- Number of dependents (< 15 years of age)
- Usual weekly working hours
- Regional unemployment rate (%)
- In gross regular income prior entry
- Previous employment state:-
 - ▶ Salaried/wage employment
 - ▶ Solo self-employment
 - ▶ Base category: Non-employment
- Birth place indicator variables:-
 - ▶ Born in a foreign English speaking country
 - ▶ Born in a foreign non-English speaking country
 - ▶ Base category: Born in Australia
- Home status indicator variables:-
 - ▶ Renting home
 - ▶ Own home with a mortgage
 - ▶ Own home without a mortgage
 - ▶ Base category: Other arrangements

Education and work experience do not reduce the hazard

	Specifications		
	(1)	(2)	(3)
Logged duration dependence	0.412*** (0.022)	0.454*** (0.026)	0.752 (0.139)
<u>Education</u>			
Year 12	0.919 (0.109)	0.885 (0.110)	0.842 (0.155)
Certificate	1.084 (0.101)	1.140 (0.110)	1.189 (0.175)
Diploma	1.182 (0.130)	1.239** (0.143)	1.479** (0.284)
Bachelor degree or higher	0.910 (0.099)	1.010 (0.118)	1.042 (0.186)
<u>Work Experience</u>			
Work experience prior entry (Years)	1.003 (0.003)	0.995 (0.007)	1.001 (0.011)
Industry tenure prior entry (Years)	1.006 (0.005)	1.000 (0.006)	0.999 (0.008)
No. of Spells	1,244		
Controls	NO	YES	YES
'Frailty'	NO	NO	YES
Log-Likelihood	-1,694.24	-1,619.87	-1,615.69
AIC	3,414.476	3,305.731	3,301.384
BIC	3,492.748	3,504.422	3,512.117

Notes: Table displayed is only a portion of the full Table of results. Estimation based on sample of inflow employers from the restricted wave 16 restricted release of HILDA. *, ** and *** are statistically significant at the 0.10, 0.05 & 0.01 levels, respectively

Cognitive & mathematics reduce the hazard

	Specifications		
	(1)	(2)	(3)
Logged duration dependence	0.412*** (0.022)	0.454*** (0.026)	0.752 (0.139)
<u>Occupation Factors</u>			
Cognitive	0.963 (0.035)	0.932* (0.040)	0.900* (0.055)
Technical Specialization	1.013 (0.037)	0.974 (0.042)	0.972 (0.060)
Mathematics	0.905*** (0.034)	0.927* (0.036)	0.895* (0.053)
Resource Management	0.930** (0.027)	0.963 (0.029)	0.929 (0.043)
Pattern Recognition	0.986 (0.033)	0.950 (0.050)	0.918 (0.069)
No. of Spells	1,244		
Controls	NO	YES	YES
'Frailty'	NO	NO	YES
Log-Likelihood	-1,694.24	-1,619.87	-1,615.69
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Discussion

- Being experienced with cognitive and mathematics skills reduces the hazard.
 - ▶ These skills assist with the entrepreneur to better estimate their entrepreneurial ability.
 - ▶ Comparative advantage in earnings in entrepreneurial sector.
- Diploma increases *employership* hazard. Potential explanation:
 - ▶ Exiting employers had a diploma in a field with strong labour market prospects.
- No effect of education & experience on employership hazard
 - ▶ Factors that are highly sought after in the salaried/wage and entrepreneurial sector. Limited comparative net gains in entrepreneurship
 - ▶ Stark contrast to previous studies. Likely due to separation of the *employer* from the *solo* self-employed.

Implications

- Government programs can train amateur entrepreneurs these skills to promote survivability.
 - ▶ Can also 'target' specific skilled entrepreneurs.
- Minimize investment risks by identifying relatively 'low risk' entrepreneurs.
- Prospective entrepreneurs can better signal their ability by getting experience with with *cognitive & math.* type activities.

Conclusion

- Learning comes from *employership* relevant experiences.
 - ▶ I.e. Exposure to *cognitive & mathematics*.
- Furthering the entrepreneurship literature by:-
 - ▶ Distinguishing between the *employer* and *solo* self-employed.
 - ▶ Examine the skills required for *employership* survival.