# The Intangible Capital of Serial Entrepreneurs

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# Background

Deep interest in serial entrepreneurs

- Belief the entrepreneurship can be learned:
    - Business schools
    - Theory and empirical evidence(Lazear, 2005)
    - Entrepreneurs learn from family history (Fairlie and Robb, 2007)

Belief that managers matter:

- CEOs choice determines outcome of firms
- Bosses determine outcomes of workers

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# Empirical Framework

**Hypothesis 1:** Serial entrepreneurs are higher "quality" for reasons that are either observable or unobservable.

**Hypothesis 2:** Serial entrepreneurs learn from their first business, so that their second business starts at a higher scale or higher productivity level.

**Hypothesis 3:** Serial entrepreneurs learn how to learn from their first business, so that their second business can scale up or grow faster than other businesses.

# DATA AND BACKGROUND STATISTICS

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# Danish Data on Entrepreneurs' Firms

- "Entrepreneurs" are founders of New Enterprises from 2001-2013.
    - Entrepreneurial firms must have at least .5 employees and some minimal sales.
    - Background on entrepreneur: education, age, experience, gender, marital status.
- "Sales" are monthly sales on VAT firms.
- "Employment, capital, education of workforce" are annual and interpolated to monthly.
    - After 2008, employment is monthly.

➔There are 216,524 firms with 191,053 founders.

This sample drops to 139,100 firms after requiring data for all control variables

➔ Given month-firm observations, there are 1.38 million observations in regressions

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# Types of Entrepreneurs and Entrepreneurial Firms

(Table 1a)

| | # of firms per entrepreneur | # of entrepreneurs | Percent | Cumulative | # of firms | Percent | Cumulative |
|---|---|---|---|---|---|---|---|
| **Novice Entrepreneurs** | 1 | 171,667 | 89.85 | 89.85 | 171,667 | 79.28 | 79.28 |
| **Serial Entrepreneurs** | 2 | 15,607 | 8.17 | 98.02 | 31,214 | 14.42 | 93.70 |
| | 3 | 2,630 | 1.38 | 99.40 | 7,890 | 3.64 | 97.34 |
| | 4 | 703 | 0.37 | 99.77 | 2,812 | 1.30 | 98.64 |
| | 5 | 229 | 0.12 | 99.89 | 1,145 | 0.53 | 99.17 |
| | 6 | 94 | 0.05 | 99.94 | 564 | 0.26 | 99.43 |
| | 7 | 43 | 0.02 | 99.96 | 301 | 0.14 | 99.57 |
| | 8 | 26 | 0.01 | 99.97 | 208 | 0.10 | 99.67 |
| | 9 | 14 | 0.01 | 99.98 | 126 | 0.06 | 99.72 |
| | 10 | 9 | 0.00 | 99.98 | 90 | 0.04 | 99.77 |
| | 11 | 5 | 0.00 | 99.99 | 55 | 0.03 | 99.79 |
| | 12 | 5 | 0.00 | 99.99 | 60 | 0.03 | 99.82 |
| | 13 | 6 | 0.00 | 99.99 | 78 | 0.04 | 99.85 |
| | 14 | 3 | 0.00 | 99.99 | 42 | 0.02 | 99.87 |
| | >15 | 12 | 0.02 | 100.00 | 272 | 0.13 | 100.00 |
| **All** | Total | 191,053 | 100.00 | | 216,524 | 100.00 | |

➔ 10% of entrepreneurs are serial

➔ 20% of firms are opened by them

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# Characteristics of Entrepreneurial Firms, Across Types of Entrepreneur (Table 2b)

| | | Serial entrepreneurs – second experience | | Serial entrepreneurs – first experience | | Novice entrepreneurs | |
|---|---|---|---|---|---|---|---|
| | | Frequency | Percent | Frequency | Percent | Frequency | Percent |
| **All firms** | Total | 23,298 | 100.0 | 21,559 | 100.0 | 171,667 | 100.0 |
| | | | | | | | |
| **Firm type** | Sole proprietorship | 2,980 | 12.8 | 8,293 | 38.5 | 126,626 | 73.8 |
| | Stock-based corporation | 1,271 | 5.5 | 1,227 | 5.7 | 3,286 | 1.9 |
| | Limited liability company | 18,958 | 81.4 | 12,006 | 55.7 | 41,664 | 24.3 |
| | Other | 89 | 0.4 | 33 | 0.2 | 91 | 0.1 |
| | | | | | | | |
| **Sectors** | Manufacturing | 1,170 | 5.0 | 1,097 | 5.1 | 7,545 | 4.4 |
| | Service | 10,490 | 45.0 | 9,440 | 43.8 | 85,184 | 49.6 |
| | High Tech Knowledge intensive service | 2,346 | 10.1 | 2,006 | 9.3 | 12,452 | 7.3 |
| | Retail | 5,433 | 23.3 | 5,268 | 24.4 | 39,994 | 23.3 |
| | Construction | 2,682 | 11.5 | 2,734 | 12.7 | 21,843 | 12.7 |
| | Other | 1,177 | 5.1 | 1,014 | 4.7 | 4,649 | 2.7 |

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# In sum, What kind of firms do they found?

The "novice" firms are:

- Run as sole proprietorships (74%)
- In the service (50%) and retail (23%) and construction (13%) sectors.
- Run only one establishment.

The "serial" firms are different as:

- Run as limited liability corporations (57% first firms, 81% second firms).
- Same industries
- "First" firms may have more than one establishment by 2013.

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# Who are they?

Who is a "novice" entrepreneur?

- They are not very well educated (39% vocational; 23% college); they are men (69%); they are 39 years old; and half are married.

Who is a "serial" entrepreneur?

- Mostly men (86%). Otherwise, the same personal characteristics as the novice.

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# REGRESSIONS COMPARING NOVICE TO SERIAL ENTREPRENEURS

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# Comparing Novice and Serial Entrepreneurs

Making use of the panel data on people and firms, the performance equation to be estimated is:

$$logY_{ijt} = \beta_1 + \beta_{21}\text{Serial}_{it}^{\text{first}} + \beta_{22}\text{Serial}_{it}^{\text{second}} + \beta_3 \text{t} + \beta_{41}\text{Serial}_{it}^{\text{first}} \times \text{t} + \beta_{42}\text{Serial}_{it}^{\text{second}} \times \text{t} + \Gamma \text{X}_{ijt} + \varepsilon_{ijt} \qquad (1)$$

- $Y_{ijt}$ is the monthly log sales or log productivity or log employment for person i for business j at time t.
- $\text{Serial}_{it}^{\text{first}}$ is a dummy equal to 1 during the panel data that serial entrepreneur is operating his first business
- $\text{Serial}_{it}^{\text{second}}$ is equal to 1 during the panel data that he is operating his second business
- t is the number of months since the business was founded
- X are controls

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# Sales, Labor Productivity and Employment of Novice and Serial Entrepreneurs – Full Sample (Table 4, industry controls)

| | Log(sales) | Log(employment) | Log(labor productivity) |
|---|---|---|---|
| | (1) | (2) | (3) |
| Serial E Firm 2 | 0.903*** | -0.049*** | 0.951*** |
| | (0.012) | (0.010) | (0.012) |
| Serial E Firm 1 | 0.665*** | 0.074*** | 0.590*** |
| | (0.012) | (0.008) | (0.010) |
| R-squared | 0.063 | 0.018 | 0.069 |
| Number of observations | 1381075 | 1381075 | 1381075 |
| | | | |
| Months | ≤12 | ≤12 | ≤12 |
| Number of Serial E Firm 2 | 11,359 | 11,359 | 11,359 |
| Number of Serial E Firm 1 | 14,458 | 14,458 | 14,458 |
| Number of Novice E | 113,283 | 113,283 | 113,283 |

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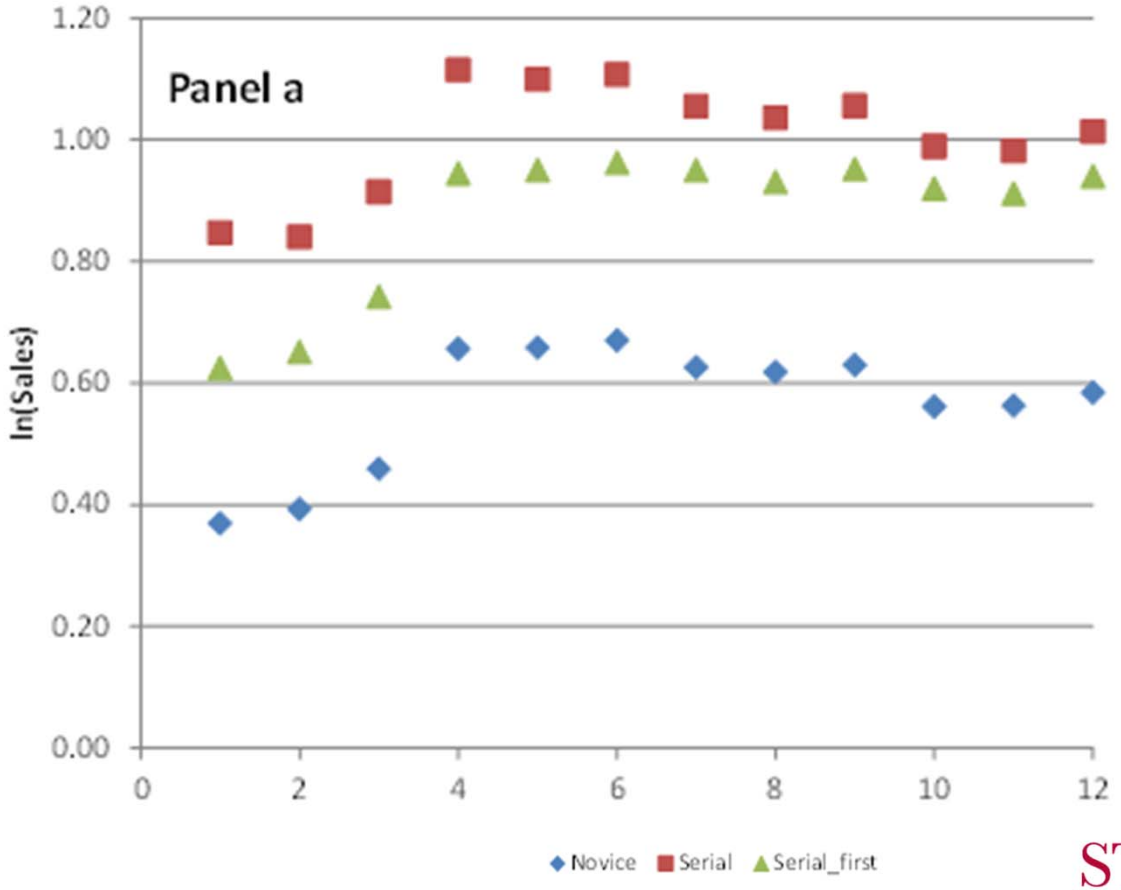
# In sum, Comparing Novice and Serial Entrepreneurs

Simple differences in means are in **Table 4**, with controls for 88 industries and month/year:

- Sales are 67% higher in the Serial Firm 1 than the Novice.
- Sales are 90% higher in Serial Firm 2 than Novice.
- Employment doesn't differ between firm types, so productivity differences are the same as sales differences.

# Sales Rise When Learning Occurs in the First Four Months

Figure 1: Non-parametric Estimation of Learning Effects for Serial Entrepreneurs (Equation 1, Table 5, column 2)

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# Table 5: Sales of Novice and Serial Entrepreneurs

| | Log(Sales) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| | OLS | OLS | FE |
| Serial E Firm 2 | 0.973*** | 0.477*** | |
| | (0.017) | (0.015) | |
| Serial E Firm 1 | 0.587*** | 0.258*** | |
| | (0.016) | (0.013) | |
| Months experience | 0.045*** | 0.013*** | 0.036*** |
| | (0.000) | (0.000) | (0.000) |
| Months exp. of SE Firm 2 | -0.011*** | -0.006*** | -0.014*** |
| | (0.002) | (0.002) | (0.001) |
| Months exp. of SE Firm 1 | 0.009*** | 0.008*** | 0.012*** |
| | (0.001) | (0.001) | (0.001) |
| Capital intensity | | 0.468*** | 0.147*** |
| | | (0.003) | (0.004) |
| Employment | | 0.714*** | 0.322*** |
| | | (0.004) | (0.006) |
| Workforce education | | -0.041*** | -0.021*** |
| | | (0.002) | (0.007) |
| Married | | 0.079*** | |
| | | (0.005) | |
| Years of Schooling | | 0.037*** | |
| | | (0.002) | |
| Male | | 0.129*** | |
| | | (0.006) | |
| Experience | | 0.002*** | |
| | | (0.000) | |
| Age | | -0.001*** | |
| | | (0.000) | |
| Immigrant | | -0.014* | |
| | | (0.008) | |
| Descendant | | 0.048*** | |
| | | (0.017) | |
| R-squared | 0.075 | 0.441 | 0.085 |
| Number of observations | 1381075 | 1381075 | 1381075 |

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# Comparing Novice and Serial Entrepreneurs – Adding Control Variables in Sales Regression

Why are serial entrepreneurs performing at higher levels than novices? (Table 5)

1. What causes the serial entrepreneur to do better on the first day?
    - More capital and labor (but not a different workforce quality)
    - They are more likely to be married.
2. Is either group learning on the job? (over time within the first year)
    - Novices are: sales go up 4.5% a month in the first year ("Months Experience" column 1), and serial entrepreneurs learn the same rate
    - True learning curve must add firm fixed effects (column 3). Sales go up 3.6% a month for novices, and are little changed for serial. Sales are also rising because capital and labor are increasing (but we can't rely on their monthly pattern).

➔ Serial Entrepreneurs start with 59% higher sales than novices, but half of that is due to their decision to start firms with more K and L (and they are men).

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# Table 6: Performance By Type of Entrepreneur

(Regressions comparable to Table 5, columns 1, 4, 6, having controls for industry, month/year)

| | Log(Sales) | Log(employment) | Log(labor productivity) |
|---|---|---|---|
| | (1) | (2) | (3) |
| Serial E Firm 2, "sequential E" | 0.626*** | -0.256*** | 0.882*** |
| | (0.040) | (0.031) | (0.048) |
| Serial E Firm 2, "portfolio E" | 1.044*** | -0.219*** | 1.263*** |
| | (0.018) | (0.016) | (0.021) |
| Serial E Firm 1, "sequential E" | 0.451*** | -0.088*** | 0.539*** |
| | (0.032) | (0.020) | (0.033) |
| Serial E Firm 1, "portfolio E" | 0.635*** | -0.020* | 0.655*** |
| | (0.018) | (0.012) | (0.018) |
| Months experience | 0.045*** | 0.016*** | 0.029*** |
| | (0.000) | (0.000) | (0.000) |
| Months exp. Serial E Firm 2, "sequential" | 0.007* | 0.018*** | -0.011** |
| | (0.004) | (0.003) | (0.005) |
| Months exp. Serial E Firm 2, "portfolio" | -0.015*** | 0.026*** | -0.041*** |
| | (0.002) | (0.001) | (0.002) |
| Months exp. Serial E Firm 1, "sequential" | -0.004 | 0.013*** | -0.017*** |
| | (0.003) | (0.002) | (0.003) |
| Months exp. Serial E Firm 1, "portfolio" | 0.013*** | 0.016*** | -0.003* |
| | (0.002) | (0.001) | (0.002) |

➔ "Portfolio" entrepreneurs have 63% greater sales than novices; "sequential" entrepreneurs have 45% greater sales.

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# REGRESSIONS COMPARING FIRMS OPENED ONLY BY SERIAL ENTREPRENEURS

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# Following Serial Entrepreneurs

(Dropping Novice Entrepreneurs)

The sample size falls, and now the coefficients on the X variables are estimated only off the serial entrepreneur data:

$$logY_{ijt} = \delta_1 + \delta_{21}\text{Serial}_{it}^{\text{second}} + \delta_3 \text{t} + \delta_{41}\text{Serial}_{it}^{\text{second}} \times \text{t} + \Gamma \text{X}_{ijt} + \varepsilon_{ijt} \quad (3)$$

The base case for the intercept and time effects are the serial entrepreneur's first firm, so the test of Hypothesis 2 is that $\delta_{21} > 0$ and the test of Hypothesis 3 is that $\delta_{41} > 0$ .

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# Table 7: Sales of Serial Entrepreneurs – Second and First Firm

| | | Log(Sales) | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| | OLS | OLS | Person-FE | Person-FE |
| Serial E Firm 2 | 0.539*** | 0.329*** | 0.504*** | 0.385*** |
| | (0.036) | (0.030) | (0.041) | (0.035) |
| Months exp. of SE Firm 2 | -0.022*** | -0.019*** | -0.021*** | -0.023*** |
| | (0.003) | (0.003) | (0.003) | (0.003) |
| Months experience | 0.052*** | 0.023*** | 0.055*** | -0.012*** |
| | (0.003) | (0.002) | (0.002) | (0.004) |
| Capital intensity | | 0.407*** | | 0.373*** |
| | | (0.009) | | (0.010) |
| Employment | | 0.675*** | | 0.573*** |
| | | (0.010) | | (0.013) |
| Workforce education | | -0.028*** | | -0.046*** |
| | | (0.006) | | (0.009) |
| Married | | 0.086*** | | 0.133*** |
| | | (0.017) | | (0.036) |
| Male | | 0.113*** | | 0.000 |
| | | (0.027) | | (.) |
| Experience | | -0.000 | | -0.000*** |
| | | (0.000) | | (0.000) |
| Age | | 0.001 | | -0.377*** |
| | | (0.001) | | (0.042) |
| Immigrant | | -0.016 | | -1.511 |
| | | (0.034) | | (1.146) |
| Descendant | | -0.034 | | -1.341 |
| | | (0.068) | | (1.138) |
| Years of Schooling | | 0.025*** | | 0.110*** |
| | | (0.005) | | (0.023) |
| R-squared | 0.055 | 0.418 | 0.550 | 0.663 |
| Number of observations | 109324 | 109324 | 109324 | 109324 |
| | | | | |
| Months | ≤12 | ≤12 | ≤12 | ≤12 |
| Number of Serial E | 6843 | 6843 | 6842 | 6843 |

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# Sales of Serial Entrepreneurs – Second and First Firm

Following the same serial entrepreneurs over time, as they open their first and then their second firm:

1. There is a 54% increase in sales – they open bigger second firms on day one.
2. About half of the increase in firm size is because they open second firms with more capital and labor (col 2).
3. Adding person fixed effects (column 3) the results are the same (column 1).
4. After controlling for K, L, the gain in sales is 39% (column 4)

➔ suggesting that there is some intangible capital obtained in the first firm that is utilized when opening a second firm with higher sales.

# Who Learns the Most?

## Table 8: Age • (Serial Firm 2)Interactions among Serial Entrepreneurs

| | | Log(Sales) | | | Log(labor productivity) | | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | OLS | OLS | Person-FE | Person-FE | OLS | OLS | Person-FE |
| Serial E Firm 2 | 0.822*** | 0.955*** | 1.533*** | 0.871*** | 0.973*** | 0.844*** | 0.778*** |
| | (0.072) | (0.069) | (0.087) | (0.072) | (0.073) | (0.074) | (0.077) |
| Serial E Firm 2 * Age | -0.007*** | -0.017*** | -0.028*** | -0.013*** | -0.007*** | -0.013*** | -0.009*** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Months exp. of SE Firm 2 | -0.022*** | -0.019*** | -0.022*** | -0.023*** | -0.036*** | -0.021*** | -0.027*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.004) | (0.003) | (0.003) |
| Months experience | 0.052*** | 0.023*** | 0.053*** | -0.011*** | 0.018*** | 0.010*** | -0.045*** |
| | (0.003) | (0.002) | (0.002) | (0.004) | (0.003) | (0.002) | (0.005) |
| Capital intensity | | 0.403*** | | 0.367*** | | 0.484*** | 0.491*** |
| | | (0.009) | | (0.010) | | (0.010) | (0.013) |
| Employment | | 0.670*** | | 0.567*** | | | |
| | | (0.010) | | (0.013) | | | |
| Workforce education | | -0.028*** | | -0.046*** | | -0.003 | -0.017* |
| | | (0.006) | | (0.009) | | (0.006) | (0.009) |
| Married | | 0.075*** | | 0.087** | | 0.048*** | 0.081** |
| | | (0.017) | | (0.037) | | (0.018) | (0.038) |
| Male | | 0.116*** | | 0.000 | | 0.115*** | 0.000 |
| | | (0.027) | | (.) | | (0.028) | (.) |
| Experience | | -0.000 | | -0.000*** | | 0.000 | -0.000*** |
| | | (0.000) | | (0.000) | | (0.000) | (0.000) |
| Age | | 0.010*** | | -0.363*** | | 0.005*** | -0.509*** |
| | | (0.001) | | (0.042) | | (0.001) | (0.049) |
| Years of Schooling | | 0.024*** | | 0.082*** | | 0.012** | 0.045* |
| | | (0.005) | | (0.023) | | (0.005) | (0.024) |
| R-squared | 0.056 | 0.421 | 0.559 | 0.665 | 0.066 | 0.362 | 0.620 |
| Number of observations | 109324 | 109324 | 109324 | 109324 | 109324 | 109324 | 109324 |
| | | | | | | | |
| Months | ≤12 | ≤12 | ≤12 | ≤12 | ≤12 | ≤12 | ≤12 |
| Number of Serial E | 6843 | 6843 | 6842 | 6843 | 6843 | 6843 | 6843 |

➔ Age 25 gains 55% in sales; Age 40 gains 35% (col 4)

➔ The older entrepreneur opens a bigger first business

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# Summary

- The serial entrepreneur has 57% greater sales the day he opens his first firm, compared to the novice:
  - Half is due to greater capital and the higher performance by men (and married men).
  - Those serial entrepreneurs who hold a portfolio of firms operate larger firms.
- The sales of the serial entrepreneur jump up by 50% on first day he opens his second firm relative to his first firm.
  - Some of this increase is due to the greater capital in the second firm.
  - Younger serial entrepreneurs learn more than older ones.

➔ The serial entrepreneur is said to be building **intangible capital** because the greater size of the second firm cannot be explained by its physical capital or human capital.

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# Appendix Table A1: Interpolated and Observed Monthly Employment

| | Interpolated employment | Observed employment |
|---|---|---|
| | Log(employment) | Log(employment) |
| | (1) | (2) |
| Serial E Firm 2 | -0.142*** | -0.112*** |
| | (0.039) | (0.032) |
| Serial E Firm 1 | 0.033 | 0.093* |
| | (0.060) | (0.050) |
| Months experience | 0.048*** | 0.012*** |
| | (0.002) | (0.002) |
| Months exp. of SE Firm 2 | 0.006* | 0.009*** |
| | (0.003) | (0.003) |
| Months exp. of SE Firm 1 | 0.013*** | 0.011** |
| | (0.005) | (0.005) |

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# Extra

# EXTRA DATA AND BACKGROUND STATISTICS

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# Characteristics of Entrepreneurs; Across Types of Entrepreneur (Table 2a)

| | | Serial entrepreneurs - second experience | | Serial entrepreneurs - first experience | | Novice entrepreneurs | | |
|---|---|---|---|---|---|---|---|---|
| | | Frequency | Percent | Frequency | Percent | Frequency | Percent | Cum |
| **Persons** | Total | 19386 | 100.00 | 17083 | 100.00 | 171,667 | 100.00 | 100.00 |
| **Education of entrepreneur** | Elementary | 2,872 | 14.8 | 2,686 | 15.7 | 34,089 | 19.9 | 19.9 |
| | High-School | 1,888 | 9.7 | 1,767 | 10.3 | 14,303 | 8.3 | 28.2 |
| | Vocational | 7,703 | 39.7 | 6,831 | 40.0 | 66,741 | 38.9 | 67.1 |
| | 2 year college | 1,478 | 7.6 | 1,204 | 7.0 | 9,333 | 5.4 | 72.5 |
| | 4 year college | 2,673 | 13.8 | 2,243 | 13.1 | 22,008 | 12.8 | 85.3 |
| | University | 2,402 | 12.4 | 1,873 | 11.0 | 17,152 | 10.0 | 95.3 |
| | Unknown | 370 | 1.9 | 479 | 2.8 | 8,041 | 4.7 | 100.0 |
| **Marital Status** | Married | 11,567 | 59.7 | 8,921 | 52.2 | 88,364 | 51.5 | 51.5 |
| | Single | 5,597 | 28.9 | 6,465 | 37.8 | 61,764 | 36.0 | 87.5 |
| | Other | 2130 | 11.0 | 1,470 | 8.6 | 18,276 | 10.7 | 98.1 |
| | Unknown | 92 | 0.5 | 227 | 1.3 | 3,263 | 1.9 | 100.0 |
| **Gender** | Man | 16,704 | 86.2 | 14,618 | 85.6 | 117,885 | 68.7 | 68.7 |
| | Woman | 2,585 | 13.3 | 2,242 | 13.1 | 50,905 | 29.7 | 98.3 |
| | Unknown | 97 | 0.5 | 223 | 1.3 | 2,877 | 1.7 | 100.0 |

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# Characteristics of Entrepreneurial Firms and Entrepreneur; Across Types of Entrepreneur (Average for First 12 Months)

(Table 3)

| | Serial entrepreneur – second experience | | | Serial entrepreneur – first experience | | | Novice entrepreneur | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | Std. Dev. | | Mean | Std. Dev. | | Mean | Std. Dev. |
| **Firm Characteristics** | | | | | | | | |
| **Sales** | 247.9 | 1,684.5 | | 286.8 | 4,490.9 | | 107.0 | 868.0 |
| **Employment** | 1.682 | 3.19 | | 2.001 | 8.91 | | 1.358 | 8.495 |
| **Labor productivity** | 392.0 | 5,546 | | 270.8 | 3,930.6 | | 115.2 | 1,770.5 |
| **Capital Stock** | 1,462.9 | 18,571 | | 1,387.9 | 19,326 | | 422.7 | 6,054.1 |
| **Capital intensity** | 3,544.4 | 409,007 | | 1,686.1 | 77,351 | | 603.2 | 11,663.0 |
| **Average years of schooling for employees** | 12.4 | 2.33 | | 12.3 | 2.32 | | 12.3 | 2.52 |
| **Entrepreneur Characteristics** | | | | | | | | |
| **Married** | 0.590 | 0.49 | | 0.521 | 0.50 | | 0.527 | 0.50 |
| **Male** | 0.867 | 0.34 | | 0.883 | 0.32 | | 0.747 | 0.43 |
| **Experience** | 13.99 | 8.99 | | 12.13 | 8.33 | | 13.13 | 9.59 |
| **Age** | 40.38 | 9.67 | | 36.61 | 9.30 | | 38.78 | 11.00 |
| **Years of Schooling** | 13.746 | 2.52 | | 13.64 | 2.53 | | 13.34 | 2.67 |

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# How do their firms fare?

The "novice" firms compared to "serial first:"

- Sales almost three times as big for serial
- Capital stock three times as big for serial
- Employees goes from 1.4 to 2

# Estimating Performance Over Time

Introduce a firm fixed effect to control for ability (in estimating the within-firm learning curve):

$$logY_{ijt} = \lambda_j + \beta_3 \mathrm{t} + \beta_{41} \mathrm{Serial}_{it}^{\mathrm{first}} \times \mathrm{t} + \beta_{42} \mathrm{Serial}_{it}^{\mathrm{second}} \times \mathrm{t} + \Gamma \mathrm{X}_{ijt} + \varepsilon_{ijt} \qquad (2)$$

where the firm fixed effect is $\lambda_j$.

But obvious drawback is that we no longer know the average difference between serial entrepreneurs and novices, $\beta_{21} \mathrm{Serial}_{it}^{\mathrm{first}} + \beta_{22} \mathrm{Serial}_{it}^{\mathrm{second}}$.

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# REGRESSIONS COMPARING FIRMS OPENED ONLY BY SERIAL ENTREPRENEURS

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# Serial Entrepreneurs with Person Fixed Effects

Add a person fixed effect to (3) to estimate:

$$logY_{ijt} = \eta_i + \delta_{21}\text{Serial}_{it}^{\text{second}} + \delta_3 \text{t} + \delta_{41}\text{Serial}_{it}^{\text{second}} \times \text{t} + \Gamma \text{X}_{ijt} + \varepsilon_{ijt} \quad (3')$$

with $\eta_i$ being time-invariant talent of serial entrepreneur $i$.