

## Online Appendix

**Table 1. Robustness Check for Educational Heterogeneity**

Educational heterogeneity	Startup Stage		Growth Stage	
	Measure reported in paper (all educational backgrounds)	Robustness check (Measure including only scientific backgrounds)	Measure reported in paper (all educational backgrounds)	Robustness check (Measure including only scientific backgrounds)
Variables	Model 1	Model 2	Model 3	Model 4
<i>Theoretical Variables</i>				
EH x Duality			-1.65**	-1.62**
	3.61** (0.38)	2.87** (1.34)	(0.29)	(0.29)
FE x Duality			-2.60**	-2.68**
	1.43** (0.43)	1.51** (0.52)	(0.28)	(0.28)
<b>Educational Heterogeneity</b>	<b>0.95*</b> <b>(0.12)</b>	<b>0.67*</b> <b>(0.12)</b>	<b>1.35** (0.13)</b>	<b>1.01** (0.13)</b>
Founding Experience	0.63** (0.18)	0.69** (0.18)	1.74** (0.12)	1.85** (0.13)
Founder-CEO duality			-0.76**	-1.01**
	0.98** (0.27)	1.06** (0.30)	(0.10)	(0.10)
<i>Control Variables</i>				
Founder-CEO Succession	0.62 (0.41)	0.66 (0.41)	-0.53** (0.17)	-0.63** (0.20)
Industry Tenure Variance	0.67* (0.20)	0.73* (0.20)	-1.20** (0.24)	-1.17** (0.24)
F. Team's Familiarity	0.69* (0.29)	0.65* (0.32)	-1.20** (0.24)	-1.23** (0.24)
Public Institution			-1.08**	-1.11**
Firm's Size (Log)	-0.56* (0.26)	-0.61* (0.26)	(0.13)	(0.13)
	0.21* (0.09)	0.18* (0.09)	-0.22** (0.05)	-0.19** (0.05)
Firm's Tech. Breadth	-0.52** (0.09)	-0.58** (0.09)	0.30** (0.06)	0.34** (0.06)
T. since II event	-0.30** (0.05)	-0.31** (0.05)	-0.04† (0.01)	-0.02 (0.02)
Prior R&D	-0.14** (0.03)	-0.14** (0.03)	0.03** (0.00)	0.02** (0.00)
Star Inventor Recruitment	2.13** (0.22)	2.21** (0.22)	0.34** (0.11)	0.38** (0.11)
Venture Capital (Log)	0.39* (0.19)	0.43* (0.19)	-1.28** (0.11)	-1.29** (0.11)
Tech Sector Density	-0.00† (0.00)	-0.00† (0.00)	0.00** (0.00)	0.01** (0.00)
Mills ratio: Failure	0.61** (0.13)	0.62** (0.13)	1.05** (0.07)	1.05** (0.07)
Mills ratio: F. Team's Survival	1.05** (0.25)	1.03** (0.25)	0.94** (0.24)	0.94** (0.24)
Constant	-2.48* (0.36)	-2.46* (0.07)	2.76** (0.38)	2.85** (0.31)
In_Theta	-4.18*	-4.17*	2.22*	2.09*
Wald Chi-Square	735.22	738.22	2905.50	2909.12
Log Likelihood	-874.28	-872.01	-2054.50	-2051.17
Number of Observations	62813	62813	43295	43295
Number of II Events	132	132	512	512

†  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$ ; EH = Educational heterogeneity, FE = Founding experience, E = Early Stage, G = Growth Stage, II = Impactful innovation event

**Table 2. Robustness Check for Founding Experience**

Founding experience measures	Startup Stage		Growth Stage	
	Measure reported in paper (# members with founding experience)	Robustness check (# new ventures founded by founders)	Measure reported in paper (# members with founding experience)	Robustness check (# new ventures founded by founders)
Variables	Model 1	Model 2	Model 3	Model 4
<i>Theoretical Variables</i>				
EH x Duality	3.61** (0.38)	3.92** (1.34)	-1.65** (0.29)	-1.78** (0.29)
FE x Duality	1.43** (0.43)	1.46** (0.52)	-2.60** (0.28)	-2.59** (0.28)
Educational Heterogeneity	0.95* (0.12)	0.93* (0.12)	1.35** (0.13)	1.25** (0.13)
<b>Founding Experience</b>	<b>0.63** (0.18)</b>	<b>0.72** (0.18)</b>	<b>1.74** (0.12)</b>	<b>1.82** (0.13)</b>
Founder-CEO duality	0.98** (0.27)	0.96** (0.30)	-0.76** (0.10)	-0.94** (0.10)
<i>Control Variables</i>				
Founder-CEO Succession	0.62 (0.41)	0.6 (0.41)	-0.53** (0.17)	-0.63** (0.20)
Industry Tenure Variance	0.67* (0.20)	0.67* (0.20)	-1.20** (0.24)	-1.17** (0.24)
F. Team's Familiarity	0.69* (0.29)	0.69* (0.32)	-1.20** (0.24)	-1.19** (0.24)
Public Institution			-1.08** (0.13)	-1.06** (0.13)
Firm's Size (Log)	-0.56* (0.26)	-0.56* (0.26)	-0.22** (0.05)	-0.22** (0.05)
Firm's Tech. Breadth	-0.52** (0.09)	-0.52** (0.09)		0.07 (0.06)
T. since II event	-0.30** (0.05)	-0.36** (0.05)	0.30** (0.06)	-0.01 (0.02)
Prior R&D	-0.14** (0.03)	-0.14** (0.03)	-0.04† (0.01)	
Star Inventor Recruitment	2.13** (0.22)	2.21** (0.22)	0.03** (0.00)	0.01** (0.00)
Venture Capital (Log)	0.39* (0.19)	0.40* (0.19)	-1.28** (0.11)	-1.29** (0.11)
Tech Sector Density	-0.00† (0.00)	-0.00† (0.00)	0.00** (0.00)	0.00** (0.00)
<i>Mills ratio: Failure</i>	0.61** (0.13)	0.61** (0.13)	1.05** (0.07)	1.05** (0.07)
<i>Mills ratio: F. Team's Survival</i>	1.05** (0.25)	1.03** (0.25)	0.94** (0.24)	0.94** (0.24)
<i>Constant</i>	-2.48* (0.36)	-2.46* (0.07)	2.76** (0.38)	2.97** (0.38)
<i>In_Theta</i>	-4.18*	-4.19*	2.22*	2.08*
<i>Wald Chi-Square</i>	735.22	733.87	2905.50	2908.15
<i>Log Likelihood</i>	-872.12	-875.28	-2054.50	-2053.17
<i>Number of Observations</i>	62813	62813	43295	43295
<i>Number of II Events</i>	132	132	512	512

**Table 3. MANOVA for Stage of Life**

Variables	Startup stage	Growth stage	<i>F</i>	<i>p</i>
Venture's size <sup>a</sup>	29.16	156.82	36.18*	0.01
Venture's intellectual capital <sup>b</sup>	3.23	13.53	11.68*	0.01
Venture's age <sup>c</sup>	4.02	11.02	9.87*	0.01
<i>Number of observations</i>	83,199	47,950		

<sup>a</sup> Number of employees; <sup>b</sup> Number of patents; <sup>c</sup> Firm's age in years

**Table 4. Selection Models** (standard errors are in parentheses)

Variables	Likelihood of Failure	Likelihood of Founder Succession
Time to VC investment	0.52* (0.09)	
Number of new VCs		0.18*(0.03)
Educational heterogeneity	-0.04* (0.02)	0.09* (0.02)
Founding experience	-0.09* (0.03)	0.12* (0.06)
Founder-CEO duality	-0.04** (0.01)	-0.21** (0.07)
CEO-Succession	-0.06* (0.02)	0.23* (0.09)
Industry Tenure Variance	-0.03(0.02)	0.08 (0.05)
F. Team's Familiarity	-0.08* (0.04)	-0.16** (0.08)
Public Institution	-0.45* (0.11)	0.23* (0.09)
Firm's Size (Log)	-0.02 (0.02)	0.07* (0.03)
Firm's Tech. Breadth	0.08 (0.06)	0.03* (0.00)
T. since BI event	-0.12** (0.05)	0.14* (0.06)
Prior R&D	-0.02 (0.02)	-0.06* (0.03)
Star Inventor Recruitment	-0.18** (0.02)	0.02 (0.02)
Venture Capital (Log)	-0.21* (0.06)	0.19* (0.08)
Tech Sector Density	-0.00* (0.00)	-0.00† (0.00)
Constant	3.11(0.12)	4.18(0.16)
Wald Chi-Square	577.16	721.04

**Table 5. Robustness check for the Likelihood of Breakthrough Innovation (5%)**

Variables	Startup Stage Ventures				Growth Stage Ventures			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
<i>Theoretical Variables</i>								
<i>Educational</i>								
Heterogeneity	1.32** (0.11)	1.28** (0.11)	1.24** (0.1)	1.21** (0.11)	1.51** (0.09)	1.48** (0.09)	1.45** (0.08)	1.36** (0.08)
Founding Experience	0.71* (0.15)	0.69** (0.15)	0.66** (0.14)	0.63** (0.14)	1.88** (0.09)	1.86** (0.09)	1.83** (0.09)	1.77** (0.09)
EH x Duality			3.33** (0.99)	3.39** (0.99)			-1.76** (0.29)	-1.84** (0.27)
FE x Duality		1.16* (0.48)		1.32** (0.46)		-2.61** (0.22)		-2.55** (0.23)
<i>Control Variables</i>								
Founder-CEO duality	1.16** (0.23)	1.19** (0.24)	1.21** (0.24)	1.17** (0.23)	-0.56** (0.06)	-0.55** (0.06)	-0.54** (0.06)	-0.56** (0.06)
CEO-Succession	0.66 (0.39)	0.64 (0.39)	0.63 (0.39)	0.62 (0.39)	-0.57** (0.16)	-0.59** (0.16)	-0.55** (0.16)	-0.61** (0.16)
Industry Tenure Variance	0.70** (0.19)	0.67* (0.20)	0.67* (0.20)	0.66* (0.19)	-1.31** (0.18)	-1.21** (0.18)	-1.27** (0.18)	-1.24** (0.18)
F. Team's Familiarity	0.62* (0.27)	0.59* (0.26)	0.57* (0.26)	0.57* (0.26)	-1.27** (0.23)	-1.31** (0.21)	-1.33** (0.21)	-1.30** (0.21)
Public Institution	-0.66* (0.30)	-0.64* (0.30)	-0.61* (0.29)	-0.59* (0.26)	-1.19** (0.13)	-1.17** (0.13)	-1.14** (0.13)	-1.11** (0.13)
Firm's Size (Log)	0.20 (0.10)	0.21 <sup>†</sup> (0.10)	0.22* (0.10)	0.23* (0.10)	-0.19** (0.05)	-0.20** (0.05)	-0.19** (0.05)	-0.20** (0.05)
Firm's Tech. Breadth	-0.49** (0.09)	-0.50** (0.09)	-0.52** (0.09)	-0.50** (0.09)	0.36** (0.05)	0.35** (0.05)	0.30** (0.05)	0.32** (0.06)
T. since BI event	-0.29** (0.05)	-0.24** (0.05)	-0.25** (0.05)	-0.26** (0.05)	-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)
Prior R&D	-0.11** (0.03)	-0.12** (0.03)	-0.12** (0.03)	-0.12** (0.03)	0.03** (0.00)	0.02** (0.00)	0.02** (0.00)	0.02** (0.00)
Star Inventor Recruitment	2.29** (0.20)	2.31** (0.19)	2.27** (0.20)	2.29** (0.20)	0.37** (0.10)	0.35** (0.11)	0.35** (0.11)	0.36** (0.10)
Venture Capital (Log)	0.45* (0.15)	0.44* (0.15)	0.43* (0.15)	0.43* (0.15)	-1.32** (0.09)	-1.31** (0.09)	-1.31** (0.09)	-1.32** (0.09)
Tech Sector Density	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)
<i>Mills ratio: Failure</i>	0.66** (0.12)	0.64** (0.12)	0.64** (0.12)	0.65** (0.12)	1.07** (0.08)	1.05** (0.08)	1.09** (0.07)	1.07** (0.07)
<i>Mills ratio: F. Team's Survival</i>	1.15** (0.23)	1.13** (0.22)	1.12** (0.22)	1.13** (0.23)	1.02** (0.21)	1.01** (0.21)	1.04** (0.20)	1.04** (0.20)
<i>Constant</i>	-2.69** (0.16)	-2.58** (0.16)	-2.56** (0.16)	-2.56* (0.16)	2.88** (0.39)	2.90** (0.40)	2.92** (0.39)	2.92** (0.39)
<i>In_Theta</i>	-4.86*	-4.73*	-4.71*	-4.68*	2.43*	2.39*	2.32*	2.30*
<i>Wald Chi-Square</i>	594.23	716.21	664.18	752.00	1403.13	2493.03	1901.30	2902.67
<i>Log Likelihood</i>	-8881.61	-879.04	-869.21	-854.07	-2169.61	-2051.11	-2121.81	-2028.06
<i>Number of Observations</i>	62813	62813	62813	62813	43295	43295	43295	43295
<i>Number of BI Events</i>	148	148	148	148	541	541	541	541

†  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$ ; EH = Educational heterogeneity, FE = Founding experience, , BI = Breakthrough innovation

**Table 6. Robustness check: Age Dependence Hypothesis (1%)**

Variables	Startup Stage Ventures < 8				Growth Stage Ventures > 8 < 20			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
<i>Theoretical Variables</i>								
<i>Educational</i>								
Heterogeneity	1.18** (0.11)	1.11** (0.12)	1.09* (0.12)	1.04** (0.12)	1.51** (0.13)	1.43** (0.13)	1.38** (0.13)	1.46** (0.13)
Founding Experience	0.66* (0.15)	0.67** (0.16)	0.67** (0.16)	0.70** (0.16)	1.89** (0.09)	1.86** (0.09)	1.82** (0.09)	1.77** (0.08)
EH x Duality			2.18** (0.34)	3.26** (0.35)			-1.75** (0.29)	-1.80** (0.28)
FE x Duality		1.41* (0.50)		1.45** (0.51)		-2.49** (0.27)		-2.41** (0.27)
<i>Control Variables</i>								
Founder-CEO duality	1.06** (0.19)	1.07** (0.19)	1.03** (0.19)	1.01** (0.19)	-0.81** (0.12)	-0.89** (0.11)	-0.91** (0.11)	-0.86** (0.11)
CEO-Succession	0.59 (0.42)	0.60 (0.42)	0.60 (0.42)	0.61 (0.42)	-0.58** (0.19)	-0.60** (0.19)	-0.61** (0.18)	-0.60** (0.18)
Industry Tenure Variance	0.65* (0.20)	0.64* (0.20)	0.64* (0.20)	0.68* (0.20)	-1.18** (0.21)	-1.21** (0.21)	-1.23** (0.21)	-1.26** (0.21)
F. Team's Familiarity	0.50** (0.10)	0.48* (0.10)	0.48** (0.10)	0.46* (0.10)	0.27* (0.08)	0.25** (0.08)	0.25** (0.08)	0.22** (0.08)
Public Institution	-0.60* (0.28)	-0.60* (0.28)	-0.58* (0.26)	-0.58* (0.26)	-1.19** (0.12)	-1.19** (0.12)	-1.16** (0.11)	-1.15** (0.11)
Firm's Size (Log)	0.26* (0.08)	0.26* (0.08)	0.24* (0.08)	0.23* (0.09)	-0.19** (0.06)	-0.20** (0.06)	-0.19** (0.06)	-0.21** (0.06)
Firm's Tech. Breadth	0.46** (0.08)	0.44** (0.08)	0.44** (0.08)	0.42** (0.09)	0.33** (0.05)	0.32** (0.05)	0.32** (0.05)	0.32** (0.05)
T. since BI event	-0.38** (0.06)	-0.36** (0.05)	-0.36** (0.05)	-0.36** (0.05)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)
Prior R&D	-0.11** (0.04)	-0.13** (0.04)	-0.14** (0.04)	-0.14** (0.04)	0.03** (0.00)	0.02** (0.00)	0.02** (0.00)	0.01** (0.00)
Star Inventor Recruitment	2.30** (0.22)	2.33** (0.19)	2.30** (0.22)	2.29** (0.22)	0.39** (0.10)	0.41** (0.09)	0.43** (0.09)	0.43** (0.09)
Venture Capital (Log)	0.37* (0.18)	0.38* (0.18)	0.38* (0.18)	0.39* (0.18)	-1.38** (0.11)	-1.37** (0.11)	-1.37** (0.11)	-1.38** (0.11)
Tech Sector Density	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.01** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)
<i>Mills ratio: Failure</i>	<i>0.64** (0.13)</i>	<i>0.63** (0.13)</i>	<i>0.63** (0.13)</i>	<i>0.62** (0.13)</i>	<i>1.05** (0.07)</i>	<i>1.03** (0.07)</i>	<i>1.03** (0.07)</i>	<i>1.05** (0.07)</i>
<i>Mills ratio: F. Team's Survival</i>	<i>1.13** (0.24)</i>	<i>1.13** (0.24)</i>	<i>1.09** (0.24)</i>	<i>1.11** (0.24)</i>	<i>0.96** (0.23)</i>	<i>0.95** (0.23)</i>	<i>0.94** (0.23)</i>	<i>0.93** (0.23)</i>
<i>Constant</i>	<i>-2.70** (0.46)</i>	<i>-2.67** (0.46)</i>	<i>-2.64** (0.46)</i>	<i>-2.64* (0.46)</i>	<i>2.90** (0.40)</i>	<i>2.90** (0.40)</i>	<i>2.89** (0.39)</i>	<i>2.87** (0.39)</i>
<i>In_Theta</i>	<i>-5.09*</i>	<i>-4.93*</i>	<i>-4.95*</i>	<i>-4.62*</i>	<i>2.55*</i>	<i>2.59*</i>	<i>2.28*</i>	<i>2.12*</i>
<i>Wald Chi-Square</i>	<i>593.04</i>	<i>718.16</i>	<i>698.64</i>	<i>741.18</i>	<i>1439.04</i>	<i>2341.23</i>	<i>1845.13</i>	<i>2916.21</i>
<i>Log Likelihood</i>	<i>-892.65</i>	<i>-876.14</i>	<i>-869.07</i>	<i>-858.69</i>	<i>-2169.76</i>	<i>-2068.06</i>	<i>-2127.09</i>	<i>-2046.41</i>
<i>Number of Observations</i>	<i>51965</i>	<i>51965</i>	<i>51965</i>	<i>51965</i>	<i>48536</i>	<i>48536</i>	<i>48536</i>	<i>48536</i>
<i>Number of BI Events</i>	<i>126</i>	<i>126</i>	<i>126</i>	<i>126</i>	<i>589</i>	<i>589</i>	<i>589</i>	<i>589</i>

†  $p < .1$ , \*  $p < .05$ , \*\*  $p < .01$ ; EH = Educational heterogeneity, FE = Founding experience, BI = Breakthrough innovation