June 13, 2025 - cascad#427

Execution Report

Title: The Different Effects of Mass-Media Marketing and Personal Sales Budgets Across the Life Cycle of B2B High-Tech Start-ups

Authors: **Arnd Vomberg, Maximilian Friess, Sascha Alavi, Verena Maag & Jan Wieseke**

Full reference: Vomberg et al. "The Different Effects of Mass-Media Marketing and Personal Sales Budgets Across the Life Cycle of B2B High-Tech Start-ups", Conditionally accepted paper, June 2025.

The structure and contents of this execution report provided by **cascad** for the certification are similar to those recommended by the AEA Data Editor.

1. DATA DESCRIPTION

This study uses a proprietary panel survey of start-ups, conducted by the research team across four survey waves. This core dataset is supplemented with three additional external databases, from Amadeus, Crunchbase and Google Trends. The data are sensitive and confidential, and can only be shared in an anonymized form.

For a thorough description of the data, please refer to Section *Data Collection and Sample* of the paper (p. 19) and Web Appendix B.

2. CODE DESCRIPTION

The verification materials contain two self-explanatory folders: *Dataset* and *Paper*. The former stores two datasets:

- data_raw.dta: this is the main dataset. It contains all required data, with the exception of those used in Appendix J.
- Distance.dta: this file contains geographical distances used in Appendix J.

The root folder also contains 52 Stata scripts. One of them, *0_Master.do*, handles the whole process: it installs the required packages, calls the other Stata do-files in order and generates all the results based on the quantitative study.

3. VERIFICATION STEPS

The verification materials were downloaded from the **cascad** website on June 9 and run as per readme, using Stata 18 on a computer with 256 GB RAM, Intel Xeon Silver 4210R 2.40GHz (32 cores), NVIDIA RTX™ A5000 and Windows 10 OS.

In addition to the five packages listed in *0_Master.do*, we had to install two additional packages: *dm31* (for the *rmiss2* function) and *center*. We also received the following error message when the Masterfile tried running *2a_Main Model.do*:

```
. *------------------------------------------------------------------------------
. *Table 5
. *------------------------------------------------------------------------------
. *Since Models 2, 3, 5, and 6 include calculated regressors (IMR and control
. *function corrections), the standard errors reported in the paper are not based
. *on those provided by the cmp command. Instead, we obtained the standard errors
. *using bootstrapping (see separate files), as Papies, Ebbes, and Van Heerde
. *(2017) and Petrin and Train (2010) require.
.
. *The editor asked us to additionally include models without endogeneity
. *corrections (Model 1 and Model 4). For these models, we report the
. *clustered standard errors directly from the cmp output.
.
. *Model 1: Unmoderated Model - w/o IMR and CF
. *Standard errors are based on the cmp command, as no calculated endogeneity
. *corrections are included in the model.
. cmp (SalesRev = c_cfinM_s c_cfinV_s
>          c.$OLC_s
>          c_prio_p_s c_liq_s $control_s  w3 w4
>          i.idx)
>          (Cust = c_cfinM_c c_cfinV_c
>          c.$OLC_c
>          c_prio_p_c c_liq_c $control_c  w3 w4
>          i.idx)
>          ,
>          indicators($cmp_cont $cmp_cont) cluster(idx) quietly
Error: cmp works with ghk2() version 1.7.0 or later.
To install or update it, type or click on ssc install ghk2, replace. Then restart Stata.
file not found
r(601);
```

According to the readme, such issue was expected:

Additional Notes:

- IMPORTANT: Please note that we have experienced that cmp may produce an error message on its first run (i.e., the first call after opening Stata). Simply rerun the code; the error typically disappears on the second attempt.

However, simply rerunning the code as instructed did not work. We had to use the *ssc install ghk2, replace* command.

We encountered no other issues afterwards.

4. FINDINGS

We reproduced with accuracy all the results that are part of the quantitative study: that is, Tables 3-7, E1-E2, F1-F2, G1-G2, I2 and Web Appendices C, J, as well as Figures 1 (top left panel only), 2 and H1-H2.
Tables 1-2, F3, I1 and Figure B1 do not contain numerical results. Similarly, Tables A1-A3 and D1 are based on results that are not part of the quantitative study. As a result, they are outside the scope of this certification.

4.1. **TABLE 3.** SAMPLE CHARACTERISTICS AND ILLUSTRATIVE EXAMPLES OF START-UPS IN THE SAMPLE

Distribution of venture industry:

Tabulation of IND

Venture Industry	Freq.	Percent	Cum.
IT/software engineering	47	23.50	23.50
SaaS	28	14.00	37.50
Industry 4.0/industrial technology/production	34	17.00	54.50
Bio-, nano-, medicine technology	13	6.50	61.00
Online marketplace/services	15	7.50	68.50
Food tech	12	6.00	74.50
E-commerce	6	3.00	77.50
Consulting	11	5.50	83.00
Online service portal	4	2.00	85.00
FinTech	2	1.00	86.00
Other (e.g., green tech, games, mobile, education)	28	14.00	100.00
Total	200	100.00	

Distribution of venture age:

Summary statistics

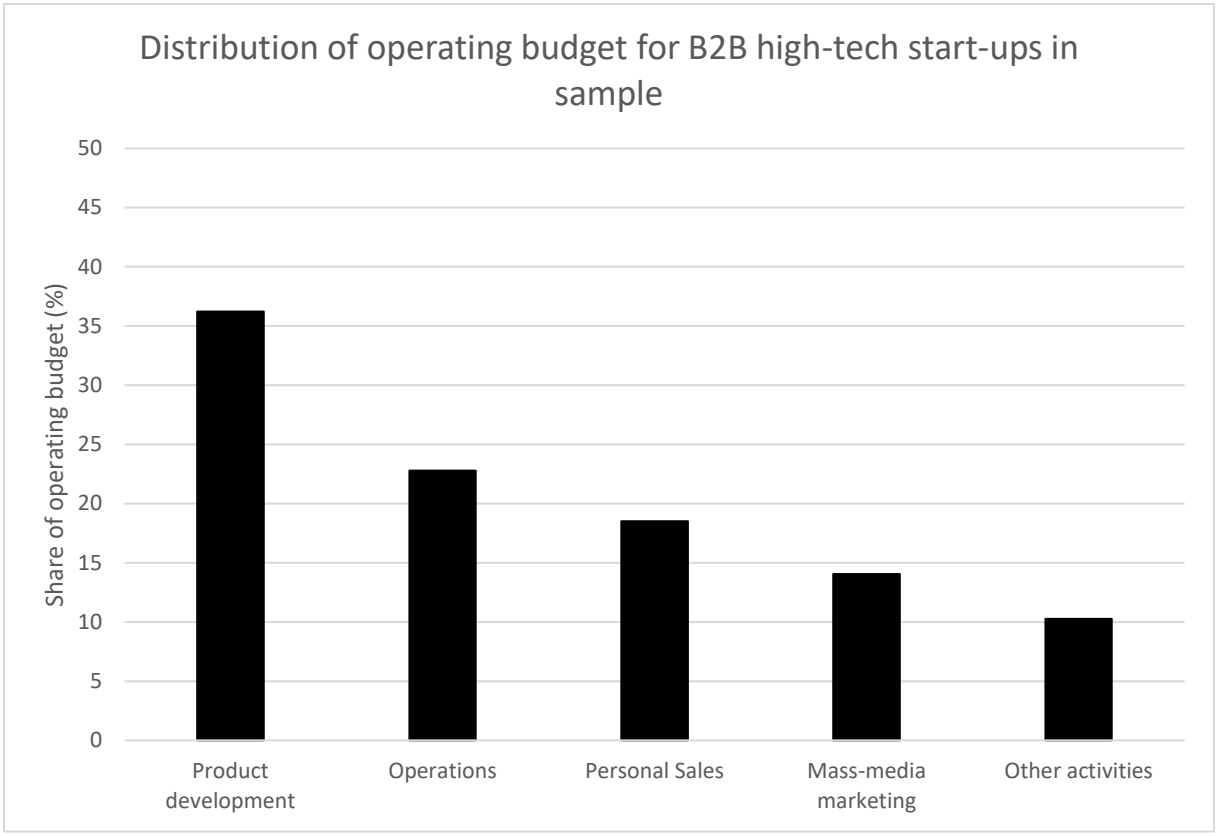
	Mean
Tenure1	.1841
Tenure2	.2587
Tenure3	.1393
Tenure4	.1542
Tenure5	.0796
Tenure6	.0597
Tenure7	.1244

Respondents characteristics:

Summary statistics

	Mean
Pos CoFounder	.5075
Pos CEO	.2985
Pos COO	.01
Pos CMO	.0746
Pos CSO	.0547
Pos Other	.0547
age	33.9845
linkedinSalesExper~s	8.68
linkedinMKTExperie~s	14.312

4.2. **FIGURE 1.** OPERATING BUDGET OF START-UPS IN THE RESEARCH SAMPLE



4.3. **TABLE 4.** DESCRIPTIVE STATISTICS AND CORRELATIONS

Pairwise correlations

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.0000													
0.16*	1.0000												
-0.0200	0.31*	1.0000											
0.0100	0.10*	0.17*	1.0000										
0.37*	0.19*	-0.10*	-0.0700	1.0000									
0.0400	-0.20*	-0.27*	-0.25*	0.0800	1.0000								
0.19*	-0.0200	0.0500	-0.11*	0.0600	0.10*	1.0000							
0.10*	0.12*	0.12*	-0.0300	0.0100	0.0300	0.0500	1.0000						
-0.0100	-0.0400	0.0700	0.0700	0.0000	0.0200	-0.0600	-0.0400	1.0000					
-0.0500	-0.0400	0.0200	0.0600	-0.10*	0.0500	-0.0500	0.0100	-0.0200	1.0000				
0.0400	-0.0500	-0.0200	-0.0600	-0.0200	0.12*	0.0700	-0.10*	-0.0500	-0.0500	1.0000			
-0.0100	0.11*	-0.0200	-0.0500	0.0100	0.0100	-0.0400	-0.0300	0.0100	-0.0500	0.08*	1.0000		
-0.0300	0.0800	0.0100	-0.0300	-0.0200	-0.0300	-0.0300	-0.0300	0.0600	-0.0700	-0.0600	0.0500	1.0000	
0.0500	0.0200	-0.0100	0.0600	-0.0500	-0.0300	0.0200	0.0100	-0.10*	-0.09*	0.15*	-0.0700	-0.09*	1.0000

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SalesRev	407	10.896	4.074	0	17.6222
Cust	598	3.9084	2.1311	0	9.9035
MMMR	640	14.7415	12.27	0	90
PSR	640	20.1729	14.1648	0	95
Venture age	640	3.4528	2.2994	0	11.7973
Product development focus	640	5.3656	1.7127	1	7
Liquidity	640	4.375	1.6243	1	7
Number of investors	640	3.1428	6.5772	0	150
Change founder team	640	.1016	.3547	0	3
Pirzes won	640	.1297	.3961	0	3
Industry start-up entries	640	188.4875	159.5596	10	539
Industry start-up closes-to-entr	640	4.2834	3.9216	0	24
Industry concentration	640	3.1098	5.0737	.1835	43.6319
Industry growth	640	9.3664	3.6719	-16.5398	26.3901

4.4. **TABLE 5.** EFFECTS OF MASS-MEDIA MARKETING AND PERSONAL SALES EXPENSE RATIOS IN THE OLC

Model 1:

Mixed-process regression Number of obs = 640
Wald chi2(30) = 19145.27
Log pseudolikelihood = -1219.2217 Prob > chi2 = 0.0000
(Std. err. adjusted for 276 clusters in idx)

	Coefficient	std.	z	P>z
SalesRev				
c_cfinM_s	-0.009	0.008	-1.160	0.245
c_cfinV_s	0.030	0.012	2.410	0.016
c_Tenure_s	2.338	0.935	2.500	0.012
c_prio_p_s	-0.209	0.119	-1.760	0.079
c_liq_s	0.194	0.123	1.580	0.115
c_n_investors_s	0.038	0.039	0.990	0.320
c_change_team_s	-0.027	0.463	-0.060	0.954
c_prize_s	0.719	1.152	0.620	0.533
c_Anzahl1Y_s	-0.003	0.007	-0.450	0.650
c_ClosesTOEntri es_s	-0.027	0.058	-0.470	0.638
c_hhi_sic_s	0.098	0.100	0.970	0.330
c_sg_sic_avg_s	-0.087	0.103	-0.850	0.397
w3	-1.153	0.639	-1.800	0.071
w4	-1.740	0.977	-1.780	0.075
Cust				
c_cfinM_c	0.003	0.006	0.460	0.648
c_cfinV_c	0.002	0.005	0.400	0.691
c_Tenure_c	0.622	0.337	1.850	0.065
c_prio_p_c	-0.009	0.029	-0.320	0.751
c_liq_c	-0.036	0.046	-0.790	0.432
c_n_investors_c	0.014	0.016	0.880	0.377
c_change_team_c	0.621	0.376	1.650	0.099
c_prize_c	0.134	0.266	0.500	0.615
c_Anzahl1Y_c	0.001	0.002	0.390	0.694
c_ClosesTOEntri es_c	0.015	0.029	0.520	0.601
c_hhi_sic_c	-0.045	0.030	-1.500	0.135
c_sg_sic_avg_c	0.026	0.040	0.660	0.507

Model 2:

		Coeff.	Bootsrapped se	Bootstrapped t-value
Sales	MMMR"	-0.008	0.012	-0.6959
Sales	PSR	0.030	0.015	2.0738
Sales	Venture_Age	1.457	0.995	1.4639
Sales	Prio	-0.215	0.124	-1.7394
Sales	Liquidity	0.163	0.133	1.2246
Sales	#Investors	0.047	0.070	0.6667
Sales	Change Team	0.135	0.707	0.1914
Sales	Prize Won	0.701	1.103	0.6359
Sales	#Start-Ups	0.001	0.007	0.0711
Sales	Closes/Entries	-0.019	0.074	-0.2614
Sales	HHI	0.124	0.122	1.0159
Sales	Growth	-0.104	0.110	-0.9404
Sales	IMR nonresp	-0.511	1.675	-0.3051
Sales	IMR attrition	0.564	0.164	3.4472
Cust	MMMR	0.003	0.006	0.4692
Cust	PSR	0.002	0.004	0.4217
Cust	Venture_Age	0.648	0.307	2.1105
Cust	Prio	-0.009	0.028	-0.3277
Cust	Liquidity	-0.036	0.044	-0.8164
Cust	#Investors	0.014	0.016	0.8871
Cust	Change Team	0.621	0.403	1.5413
Cust	Prize Won	0.125	0.183	0.6824
Cust	#Start-Ups	0.001	0.001	0.5573
Cust	Closes/Entries	0.016	0.023	0.6946
Cust	HHI	-0.047	0.024	-1.9385
Cust	Growth	0.028	0.032	0.8896
Cust	IMR attritio	-0.014	0.048	-0.2881

Model 3:

		Coeff.	Bootsrapped se	Bootstrapped t-value
Sales	MMMR"	-0.011	0.013	-0.8149
Sales	PSR	0.030	0.015	2.0186
Sales	Venture_Age	1.259	1.150	1.0941
Sales	Prio	-0.123	0.160	-0.7694
Sales	Liquidity	0.149	0.163	0.9139
Sales	#Investors	0.042	0.078	0.5361
Sales	Change Team	0.384	0.883	0.4345
Sales	Prize Won	0.653	1.194	0.5471
Sales	#Start-Ups	0.005	0.010	0.5223
Sales	Closes/Entries	-0.006	0.096	-0.0610
Sales	HHI	0.150	0.169	0.8847
Sales	Growth	-0.124	0.136	-0.9163
Sales	IMR nonresp	-0.608	1.755	-0.3463
Sales	IMR attrition	0.590	0.191	3.0850
Sales	CF MMMR Res	0.082	0.143	0.5752
Sales	CF PSR Res	0.056	0.082	0.6751
Cust	MMMR	0.003	0.005	0.5215
Cust	PSR	0.003	0.004	0.7025
Cust	Venture_Age	0.915	0.505	1.8132
Cust	Prio	-0.030	0.059	-0.5071
Cust	Liquidity	-0.066	0.068	-0.9756
Cust	#Investors	-0.003	0.026	-0.1011
Cust	Change Team	0.421	0.458	0.9183
Cust	Prize Won	0.180	0.225	0.7998
Cust	#Start-Ups	0.000	0.004	0.0993
Cust	Closes/Entries	0.015	0.036	0.4204
Cust	HHI	-0.017	0.056	-0.3026
Cust	Growth	0.038	0.052	0.7275
Cust	IMR attrition	-0.013	0.079	-0.1619
Cust	CF MMMR Res	0.015	0.071	0.2058
Cust	CF PSR Re	-0.065	0.039	-1.6684

Model 4:

Mixed-process regression Number of obs = 640
Wald chi2(34) = 15927.44
Log pseudolikelihood = -1208.9049 Prob > chi2 = 0.0000
(Std. err. adjusted for 276 clusters in idx)

	Coefficient	std. err.	z	P>z
SalesRev				
c_cfinM_s	-0.002	0.008	-0.270	0.788
c_cfinV_s	0.026	0.012	2.180	0.029
c_Tenure_s	2.295	0.943	2.430	0.015
c.c_cfinM_s#c.c_Tenure_s	0.003	0.002	1.750	0.081
c.c_cfinV_s#c.c_Tenure_s	-0.011	0.006	-1.900	0.057
c_prio_p_s	-0.179	0.120	-1.490	0.137
c_liq_s	0.203	0.122	1.660	0.097
c_n_investors_s	0.045	0.039	1.170	0.244
c_change_team_s	0.092	0.450	0.200	0.838
c_prize_s	0.711	1.166	0.610	0.542
c_Anzahl1Y_s	-0.002	0.007	-0.300	0.765
c_ClosesTOEntries_s	-0.027	0.056	-0.480	0.634
c_hhi_sic_s	0.105	0.102	1.030	0.305
c_sg_sic_avg_s	-0.104	0.103	-1.010	0.311
Cust				
c_cfinM_c	0.008	0.004	1.950	0.051
c_cfinV_c	-0.004	0.005	-0.800	0.422
c_Tenure_c	0.573	0.320	1.790	0.073
c.c_cfinM_c#c.c_Tenure_c	0.006	0.003	2.490	0.013
c.c_cfinV_c#c.c_Tenure_c	-0.005	0.002	-2.420	0.016
c_prio_p_c	-0.003	0.029	-0.120	0.907
c_liq_c	-0.038	0.045	-0.840	0.402
c_n_investors_c	0.014	0.016	0.860	0.387
c_change_team_c	0.689	0.381	1.810	0.070
c_prize_c	0.165	0.260	0.640	0.525
c_Anzahl1Y_c	0.001	0.002	0.460	0.648
c_ClosesTOEntries_c	0.009	0.028	0.340	0.734
c_hhi_sic_c	-0.049	0.030	-1.630	0.102
c_sg_sic_avg_c	0.025	0.038	0.660	0.512

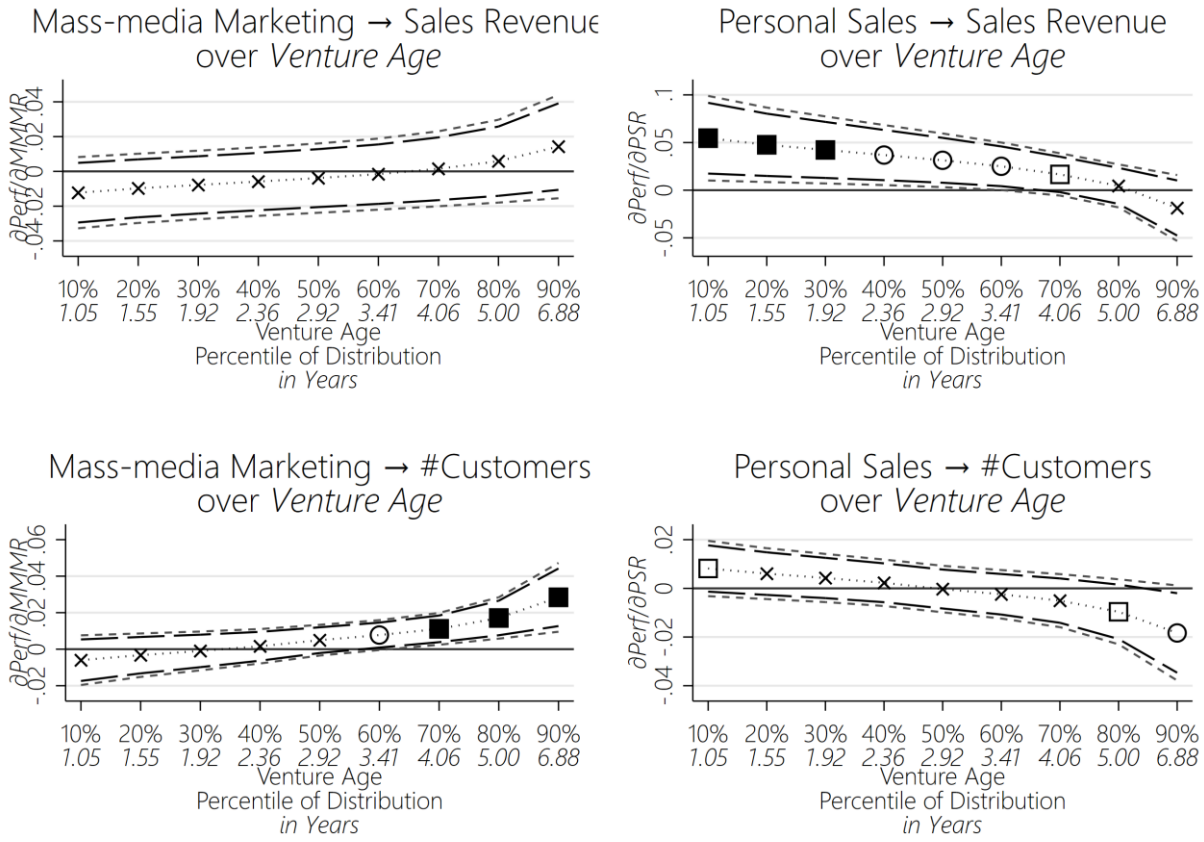
Model 5:

		Coeff.	Bootsrapped se	Bootstrapped t-value
Sales	MMMR"	0.000	0.013	-0.0125
Sales	PSR	0.026	0.014	1.7829
Sales	Venture_Age	1.374	1.000	1.3738
Sales	MMMRxAge	0.003	0.003	0.9872
Sales	PSRxAge	-0.012	0.006	-1.9725
Sales	Prio	-0.183	0.123	-1.4913
Sales	Liquidity	0.182	0.134	1.3597
Sales	#Investors	0.054	0.072	0.7591
Sales	Change Team	0.221	0.699	0.3158
Sales	Prize Won	0.714	1.126	0.6342
Sales	#Start-Ups	0.002	0.007	0.2338
Sales	Closes/Entries	-0.012	0.073	-0.1628
Sales	HHI	0.136	0.125	1.0823
Sales	Growth	-0.124	0.113	-1.1024
Sales	IMR nonresp	-0.260	1.672	-0.1557
Sales	IMR attrition	0.594	0.163	3.6471
Cust	MMMR	0.008	0.004	2.0302
Cust	PSR	-0.004	0.004	-0.9712
Cust	Venture_Age	0.585	0.298	1.9625
Cust	MMMRxAge	0.006	0.002	2.7825
Cust	PSRxAge	-0.005	0.002	-2.3301
Cust	Prio	-0.003	0.027	-0.1194
Cust	Liquidity	-0.038	0.043	-0.8799
Cust	#Investors	0.014	0.017	0.8555
Cust	Change Team	0.690	0.409	1.6844
Cust	Prize Won	0.158	0.175	0.9046
Cust	#Start-Ups	0.001	0.001	0.6368
Cust	Closes/Entries	0.010	0.022	0.4387
Cust	HHI	-0.050	0.025	-1.9728
Cust	Growth	0.026	0.031	0.8423
Cust	IMR attrition	-0.007	0.048	-0.1368

Model 6:

		Coeff.	Bootsrapped se	Bootstrapped t-value
Sales	MMMR"	-0.001	0.014	-0.0917
Sales	PSR	0.024	0.015	1.6497
Sales	Venture_Age	1.031	1.204	0.8566
Sales	MMMRxAge	0.005	0.004	1.2749
Sales	PSRxAge	-0.013	0.006	-2.0773
Sales	Prio	-0.069	0.167	-0.4118
Sales	Liquidity	0.179	0.171	1.0480
Sales	#Investors	0.055	0.081	0.6837
Sales	Change Team	0.553	0.890	0.6217
Sales	Prize Won	0.640	1.249	0.5119
Sales	#Start-Ups	0.007	0.011	0.6233
Sales	Closes/Entries	0.002	0.098	0.0195
Sales	HHI	0.159	0.179	0.8841
Sales	Growth	-0.155	0.144	-1.0764
Sales	IMR nonresp	-0.296	1.762	-0.1679
Sales	IMR attrition	0.620	0.199	3.1111
Sales	CF MMMR Res	0.084	0.154	0.5445
Sales	CF PSR Res	0.082	0.094	0.8696
Cust	MMMR	0.008	0.004	1.9868
Cust	PSR	-0.003	0.004	-0.5846
Cust	Venture_Age	0.814	0.474	1.7170
Cust	MMMRxAge	0.006	0.002	2.6193
Cust	PSRxAge	-0.005	0.002	-2.0887
Cust	Prio	-0.018	0.056	-0.3300
Cust	Liquidity	-0.064	0.064	-1.0080
Cust	#Investors	0.000	0.025	-0.0188
Cust	Change Team	0.518	0.454	1.1417
Cust	Prize Won	0.205	0.212	0.9671
Cust	#Start-Ups	0.001	0.004	0.1976
Cust	Closes/Entries	0.011	0.035	0.3106
Cust	HHI	-0.023	0.053	-0.4234
Cust	Growth	0.033	0.049	0.6816
Cust	IMR attrition	-0.006	0.074	-0.0745
Cust	CF MMMR Res	0.016	0.065	0.2393
Cust	CF PSR Re	-0.054	0.037	-1.4671

4.5. **FIGURE 2.** FLOODLIGHT ANALYSIS OF MODERATING EFFECTS



4.6. **TABLE 6.** INTERACTION EFFECTS WITH ALTERNATIVE OLC MARKERS

	Sales revenue			#Customers		
	Coefficient	Std. Err.	t-stat	Coefficient	Std. Err.	t-stat
PSRxPopularity	-0.0014	0.0008	-1.7285	-0.0004	0.0003	-1.7193
PSRxSize	-0.014	0.008	-1.817	-0.009	0.004	-2.329
PSRxDevIndex	-0.075	0.040	-1.869	-0.020	0.011	-1.703
MMMRxPopularity	0.0022	0.0012	1.7467	0.0009	0.0003	2.6542
MMMRxSize	0.013	0.010	1.349	0.024	0.007	3.659
MMMRxDevIndex	0.109	0.065	1.677	0.090	0.020	4.466

4.7. **TABLE 7.** MARGINAL EFFECTS OF MASS-MEDIA MARKETING AND PERSONAL SALES EXPENSE RATIOS ON START-UP PERFORMANCE ACROSS THE OLC.

Marginal Effects of MMMR and PSR on Performance

	Sales(%)	Sales(USD)	Cust. (%)	Cust. (~)
MM Early	-9.17	-56603.80	-0.80	-5.72
MM Late	0.94	5801.79	12.01	85.91
PS Early	47.27	291903.30	4.16	29.76
PS Late	18.34	113247.30	-5.63	-40.29

4.8. WEB APPENDIX C: MEASUREMENTS OF INSTRUMENTAL VARIABLES FOR THE SELECTION MODELS

Respondent confidence:

Item	Label	ITTC	IR	SE	z	M	SD
confid1	The entrepreneur seemed ve~n	0.87	0.85	0.01	107.81	5.72	1.16
confid2	The entrepreneur made a ve~n	0.87	0.84	0.01	105.93	5.62	1.19
confid3	The entrepreneur seemed ve~n	0.84	0.76	0.01	82.67	5.85	1.13

Reliability & Validity Summary	
Cronbach's Alpha	0.93
Chi-Square (df)	0.00 (0)
Chi-Square/df	.
CFI	1.00
RMSEA	0.00
SRMR	0.00
NNFI / TLI	1.00
Composite Reliability	0.93
Average Variance Extracted (AVE)	0.82

Structured Respondent:

Item	Label	ITTC	IR	SE	z	M	SD
struktur1	The entrepreneur appeared ~s	0.85	0.80	0.01	89.68	5.49	1.36
struktur2	The entrepreneur communica~e	0.87	0.85	0.01	105.86	5.56	1.38
struktur3	The entrepreneur formulate~a	0.84	0.78	0.01	86.34	5.54	1.27

Reliability & Validity Summary	
Cronbach's Alpha	0.93
Chi-Square (df)	0.00 (0)
Chi-Square/df	.
CFI	1.00
RMSEA	0.00
SRMR	0.00
NNFI / TLI	1.00
Composite Reliability	0.93
Average Variance Extracted (AVE)	0.81

Note: According to the readme, “the reported Kappa is derived from internal data.”

4.9. **TABLE E1.** NEXT-PERIOD ATTRITION

Probit regression

attrition_next	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
MMMR	.0024	.0047	0.51	.6088	-.0068	.0116	
PSR	.0052	.004	1.31	.1908	-.0026	.0129	
Venture age	.0686	.0233	2.95	.0032	.023	.1143	***
Product developmen~s	.0288	.0338	0.85	.3939	-.0374	.0949	
Liquidity	.002	.032	0.06	.9492	-.0608	.0648	
Number of investors	.0163	.0075	2.18	.0296	.0016	.0309	**
Change founder team	-.1973	.2066	-0.95	.3397	-.6023	.2077	
Pirzes won	-.026	.1725	-0.15	.8801	-.3642	.3121	
Industry start-up ~s	.0006	.0004	1.72	.0846	-.0001	.0013	*
Industry start-up ~r	-.0037	.0143	-0.26	.795	-.0318	.0244	
Industry concentra~n	.0044	.0101	0.44	.6608	-.0154	.0243	
Industry growth	-.0208	.0136	-1.53	.1271	-.0475	.0059	
Respondent discomf~t	.1157	.0364	3.18	.0015	.0445	.187	***
Wave3	.4991	.1294	3.86	.0001	.2456	.7526	***
Constant	-1.4462	.3401	-4.25	0	-2.1127	-.7797	***

Mean dependent var	0.27	SD dependent var	0.45
Pseudo r-squared	0.06	Number of obs	597
Chi-square	41.40	Prob > chi2	0.00
Akaike crit. (AIC)	691.82	Bayesian crit. (BIC)	757.70

**** p<.01, ** p<.05, * p<.1*

4.10. **TABLE E2.** NONRESPONSE SALES REVENUE

Probit regression

non_response_sales	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
MMMR	.0051	.0046	1.10	.2704	-.0039	.0141	
PSR	-.0034	.0039	-0.87	.3838	-.0112	.0043	
Venture age	-.048	.0239	-2.01	.0446	-.0948	-.0012	**
Product developmen~s	.0262	.0316	0.83	.4078	-.0358	.0881	
Liquidity	.0569	.0339	1.68	.093	-.0095	.1233	*
Number of investors	-.0028	.0089	-0.32	.7488	-.0203	.0146	
Change founder team	-.2399	.1772	-1.35	.1757	-.5872	.1073	
Pirzes won	.1193	.1259	0.95	.3435	-.1275	.3661	
Industry start-up ~s	0	.0003	0.12	.9015	-.0006	.0007	
Industry start-up ~r	.0288	.0123	2.34	.0194	.0047	.053	**
Industry concentra~n	.0113	.0089	1.27	.205	-.0062	.0288	
Industry growth	.0003	.0152	0.02	.983	-.0295	.0301	
Respondent confide~e	-.0946	.0563	-1.68	.093	-.2049	.0158	*
Structured respond~t	-.1097	.0417	-2.63	.0085	-.1913	-.028	***
Respondent fatigue	.0898	.0439	2.05	.0407	.0038	.1758	**
Wave3	-.3856	.1145	-3.37	.0008	-.61	-.1613	***
Wave4	-.2638	.1576	-1.67	.0942	-.5728	.0451	*
Constant	.2292	.4468	0.51	.608	-.6465	1.1049	

Mean dependent var	0.44	SD dependent var	0.50
Pseudo r-squared	0.05	Number of obs	725
Chi-square	49.59	Prob > chi2	0.00
Akaike crit. (AIC)	977.05	Bayesian crit. (BIC)	1059.61

*** $p<.01$, ** $p<.05$, * $p<.1$

4.11. **TABLE F1.** MEASUREMENT OF ADDITIONAL VARIABLES FOR MDS

Item	Label	ITTC	IR	SE	z	M	SD
complexity1	The products/services offe~y	0.84	0.85	0.01	118.66	4.67	1.75
complexity2	The products/services offe~y	0.78	0.69	0.01	81.71	4.82	1.97
complexity3	The products/services offe~y	0.81	0.76	0.01	96.03	4.20	1.86

Reliability & Validity Summary		
Cronbach's Alpha	0.90	
Chi-Square (df)	0.00	(0)
Chi-Square/df	.	
CFI	1.00	
RMSEA	0.00	
SRMR	0.00	
NNFI / TLI	1.00	
Composite Reliability	0.91	
Average Variance Extracted (AVE)	0.77	

4.12. **TABLE F2.** EXAMPLES OF THE MEASUREMENTS OF THE PEER-WEIGHTED INDUSTRY MASS-MEDIA AND PERSONAL SALES EXPENSE RATIO

		Euclidean distance								
MKT	SAL	1	2	3	4	5	6	7	8	9
5	5	0	0.820	3.486	2.295	2.500	1.587	1.656	1.474	2.429
30	40	0.820	0	2.726	1.860	2.104	1.032	2.398	2.209	1.616
30	2	3.486	2.726	0	3.385	1.948	2.874	5.120	4.543	1.265
10	10	2.295	1.860	3.385	0	3.708	0.839	3.067	3.734	2.164
10	30	2.500	2.104	1.948	3.708	0	2.907	4.085	3.008	1.958
20	20	1.587	1.032	2.874	0.839	2.907	0	2.722	3.061	1.610
30	30	1.656	2.398	5.120	3.067	4.085	2.722	0	1.652	3.992
0	20	1.474	2.209	4.543	3.734	3.008	3.061	1.652	0	3.700
20	30	2.429	1.616	1.265	2.164	1.958	1.610	3.992	3.700	0

				Weights					Industry expense ratios	
1	2	3	4	5	6	7	8	9	inst_MKT	inst_SAL
0	0.950	0.785	0.859	0.846	0.902	0.898	0.909	0.850	18.728	23.173
0.944	0	0.815	0.874	0.857	0.930	0.838	0.850	0.891	15.434	18.325
0.862	0.892	0	0.866	0.923	0.887	0.798	0.821	0.950	15.665	23.280
0.891	0.912	0.839	0	0.824	0.960	0.854	0.823	0.897	18.285	22.217
0.887	0.905	0.912	0.833	0	0.869	0.816	0.865	0.912	18.200	19.617
0.905	0.938	0.827	0.950	0.825	0	0.836	0.816	0.903	16.911	20.922
0.933	0.903	0.793	0.876	0.835	0.890	0	0.933	0.838	15.314	19.681
0.937	0.906	0.806	0.840	0.871	0.869	0.929	0	0.842	19.319	21.082
0.870	0.914	0.932	0.884	0.895	0.914	0.787	0.802	0	17.061	19.488

4.13. **TABLE G1.** MASS-MEDIA EXPENSE RATIO

	(1) cfinM
Venture age	-.66
	(4.3095)
Product development focus	-.801
	(.4921)
Liquidity	.4253
	(.5059)
Number of investors	.1745***
	(.0494)
Change founder team	-.6069
	(2.3997)
Pirzes won	-1.6729
	(1.7321)
Industry start-up entries	-.0475**
	(.0218)
Industry start-up closes-to-entries	-.2902
	(.3649)
Industry concentration	-.6162*
	(.3234)
Industry growth	.2084
	(.3181)
IMR_att	-.2065
	(1.1608)
inst_MKT	.4705***
	(.1756)
inst_SAL	-.052
	(.1933)
_cons	14.8886
	(39.3969)
Observations	725
R-squared	.6822

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Sanderson Windmeijer F Tests

Endogenous V	SWF	p-value	df1	df2
Mass-media~o	10.55	0.00	1	297

4.14. **TABLE G2.** PERSONAL SALES EXPENSE RATIO

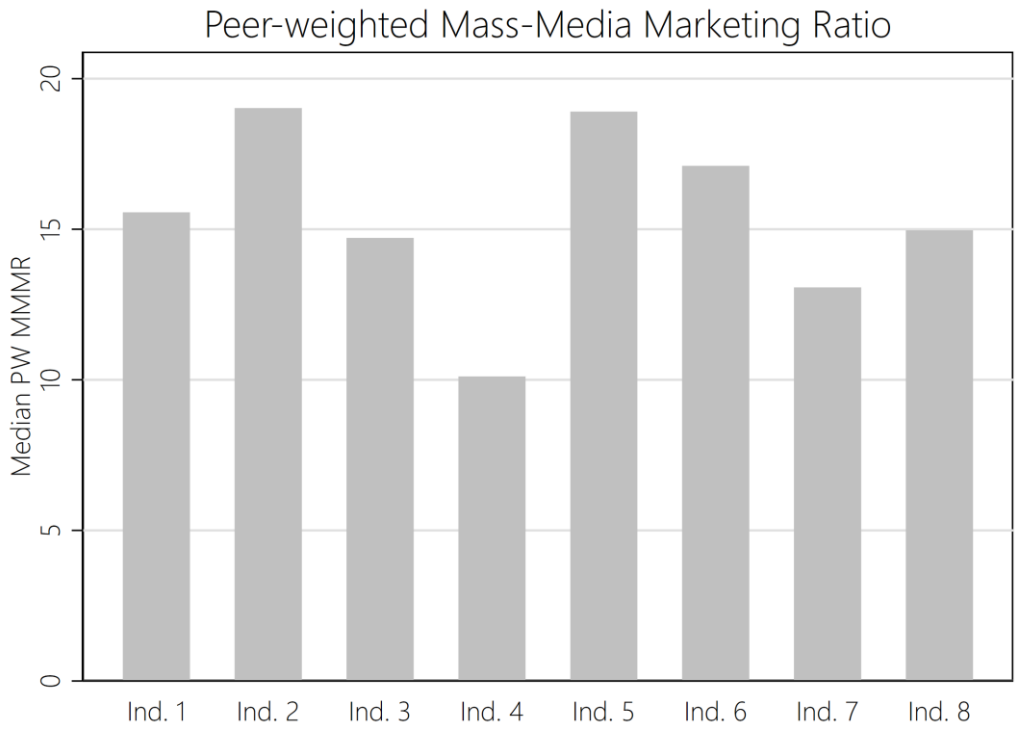
	(1) cfinV
Venture age	2.7844
	(5.2871)
Product development focus	-.5062
	(.65)
Liquidity	-.3604
	(.5783)
Number of investors	-.1756***
	(.059)
Change founder team	-4.1358
	(3.57)
Pirzes won	1.0157
	(2.6678)
Industry start-up entries	-.0112
	(.0343)
Industry start-up closes-to-entries	-.0692
	(.4673)
Industry concentration	.4257
	(.6249)
Industry growth	.0248
	(.518)
IMR_att	-.2489
	(1.592)
inst_MKT	.1701
	(.1852)
inst_SAL	.4881**
	(.1997)
_cons	-14.6771
	(48.5667)
Observations	725
R-squared	.6815

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

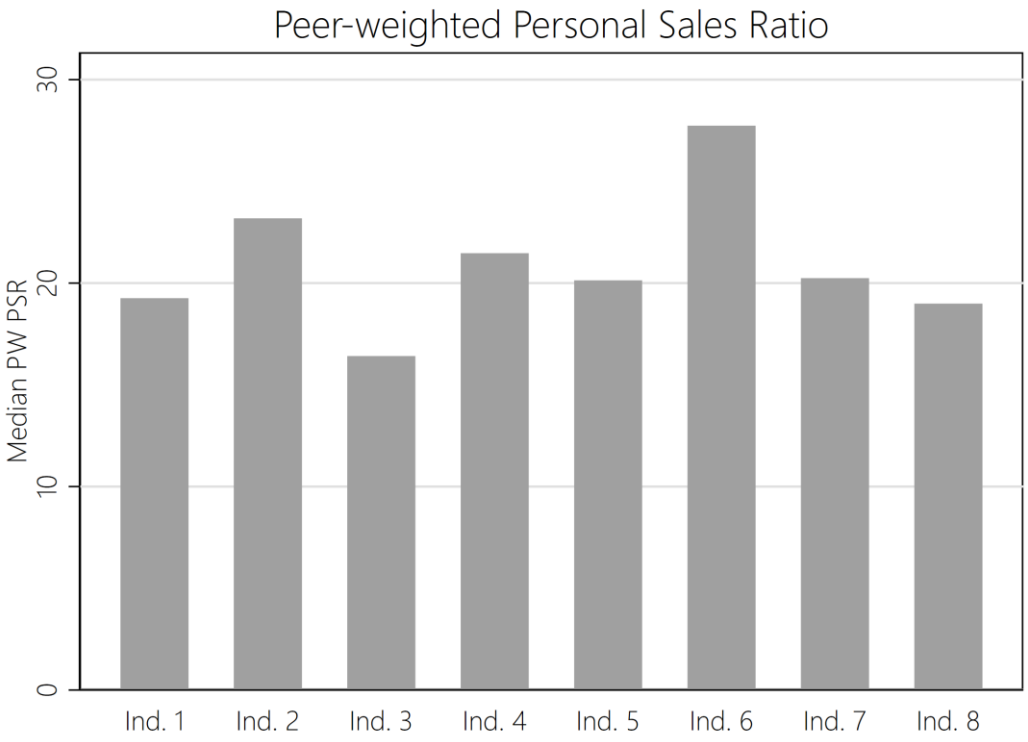
Sanderson Windmeijer F Tests

Endogenous V	SWF	p-value	df1	df2
Personal_S~o	11.52	0.00	1	297

4.15. **FIGURE H1.** MASS-MEDIA EXPENSE RATIO



4.16. **FIGURE H2.** PERSONAL SALES EXPENSE RATIO



4.17. **TABLE I2.** ALTERNATIVE OPERATIONALIZATIONS OF THE OLC STAGE

Venture popularity:

		Coeff.	Bootsrapped se	Bootstrapped t-value
Sales	MMMR"	-0.008	0.019	-0.401
Sales	PSR	0.036	0.019	1.941
Sales	Popularity	0.008	0.024	0.337
Sales	MMMRxPopularity	0.0022	0.0012	1.747
Sales	PSRxPopularity	-0.0014	0.0008	-1.729
Sales	Prio	-0.013	0.193	-0.066
Sales	Liquidity	0.143	0.176	0.812
Sales	#Investors	0.046	0.092	0.493
Sales	Change Team	0.605	1.079	0.561
Sales	Prize Won	0.564	1.240	0.455
Sales	#Start-Ups	0.005	0.009	0.530
Sales	Closes/Entries	-0.029	0.103	-0.280
Sales	HHI	0.104	0.209	0.498
Sales	Growth	-0.152	0.159	-0.956
Sales	IMR nonresp	-0.954	2.497	-0.382
Sales	IMR attrition	0.635	0.191	3.319
Sales	CF MMMR Res	0.099	0.131	0.758
Sales	CF PSR Res	0.096	0.093	1.033
Cust	MMMR	0.003	0.005	0.684
Cust	PSR	0.004	0.004	0.791
Cust	Popularity	0.005	0.005	1.054
Cust	MMMRxPopularity	0.001	0.000	2.654
Cust	PSRxPopularity	0.000	0.000	-1.719
Cust	Prio	-0.001	0.062	-0.014
Cust	Liquidity	-0.068	0.066	-1.022
Cust	#Investors	-0.001	0.026	-0.051
Cust	Change Team	0.560	0.460	1.217
Cust	Prize Won	0.271	0.232	1.171
Cust	#Start-Ups	0.000	0.003	0.101
Cust	Closes/Entries	0.018	0.036	0.485
Cust	HHI	-0.003	0.070	-0.048
Cust	Growth	0.004	0.048	0.092
Cust	IMR attrition	0.110	0.063	1.736
Cust	CF MMMR Res	0.034	0.073	0.467
Cust	CF PSR Re	-0.055	0.032	-1.718

Relative venture size:

		Coeff.	Bootsrapped se	Bootstrapped t-value
Sales	MMMR"	0.001	0.018	0.067
Sales	PSR	0.013	0.016	0.789
Sales	Popularity	0.130	0.255	0.507
Sales	MMMRxPopularity	0.013	0.010	1.349
Sales	PSRxPopularity	-0.014	0.008	-1.817
Sales	Prio	-0.085	0.196	-0.432
Sales	Liquidity	0.004	0.158	0.024
Sales	#Investors	0.019	0.069	0.277
Sales	Change Team	0.505	1.295	0.390
Sales	Prize Won	0.110	1.083	0.102
Sales	#Start-Ups	0.002	0.008	0.285
Sales	Closes/Entries	-0.001	0.118	-0.008
Sales	HHI	0.208	0.218	0.952
Sales	Growth	-0.240	0.162	-1.480
Sales	IMR nonresp	-0.106	2.154	-0.049
Sales	IMR attrition	0.828	0.177	4.671
Sales	CF MMMR Res	0.087	0.133	0.654
Sales	CF PSR Res	0.081	0.084	0.968
Cust	MMMR	0.015	0.005	2.906
Cust	PSR	-0.004	0.004	-0.952
Cust	Popularity	0.143	0.133	1.073
Cust	MMMRxPopularity	0.024	0.007	3.659
Cust	PSRxPopularity	-0.009	0.004	-2.329
Cust	Prio	-0.020	0.103	-0.199
Cust	Liquidity	-0.068	0.087	-0.779
Cust	#Investors	0.000	0.028	-0.017
Cust	Change Team	0.535	0.544	0.983
Cust	Prize Won	0.125	0.262	0.477
Cust	#Start-Ups	-0.001	0.003	-0.484
Cust	Closes/Entries	-0.012	0.067	-0.181
Cust	HHI	-0.022	0.090	-0.242
Cust	Growth	0.031	0.065	0.480
Cust	IMR attrition	0.104	0.067	1.535
Cust	CF MMMR Res	0.001	0.074	0.013
Cust	CF PSR Re	-0.051	0.054	-0.935

Venture Development Index:

		Coeff.	Bootsrapped se	Bootstrapped t-value
Sales	MMMR"	-0.004	0.020	-0.200
Sales	PSR	0.017	0.014	1.221
Sales	Popularity	4.970	3.247	1.531
Sales	MMMRxPopularity	0.109	0.065	1.677
Sales	PSRxPopularity	-0.075	0.040	-1.869
Sales	Prio	-0.024	0.208	-0.117
Sales	Liquidity	-0.029	0.200	-0.146
Sales	#Investors	-0.001	0.082	-0.017
Sales	Change Team	0.261	1.128	0.231
Sales	Prize Won	-0.070	1.298	-0.054
Sales	#Start-Ups	0.010	0.009	1.078
Sales	Closes/Entries	-0.026	0.119	-0.221
Sales	HHI	0.148	0.180	0.822
Sales	Growth	-0.151	0.132	-1.143
Sales	IMR nonresp	-1.006	3.040	-0.331
Sales	IMR attrition	0.271	0.189	1.433
Sales	CF MMMR Res	0.088	0.189	0.463
Sales	CF PSR Res	0.091	0.093	0.975
Cust	MMMR	0.002	0.004	0.500
Cust	PSR	0.006	0.005	1.278
Cust	Popularity	0.976	0.497	1.965
Cust	MMMRxPopularity	0.090	0.020	4.466
Cust	PSRxPopularity	-0.020	0.011	-1.703
Cust	Prio	-0.015	0.072	-0.215
Cust	Liquidity	-0.080	0.082	-0.965
Cust	#Investors	-0.014	0.029	-0.472
Cust	Change Team	0.502	0.505	0.994
Cust	Prize Won	0.013	0.257	0.050
Cust	#Start-Ups	-0.001	0.003	-0.230
Cust	Closes/Entries	0.004	0.039	0.103
Cust	HHI	0.012	0.063	0.191
Cust	Growth	0.000	0.046	0.003
Cust	IMR attrition	0.045	0.065	0.687
Cust	CF MMMR Res	0.029	0.074	0.387
Cust	CF PSR Re	-0.055	0.036	-1.509

4.18. **WEB APPENDIX J:** REPLICATION WITH AIR-DISTANCE-WEIGHTED INSTRUMENTAL

Model 3: Unmoderated Results with IMR and CF

		Coeff.	Bootsrapped se	Bootstrapped t-value
Sales	MMMR"	-0.011	0.014	-0.808
Sales	PSR	0.030	0.015	2.025
Sales	Venture_Age	1.347	1.243	1.084
Sales	Prio	-0.113	0.198	-0.569
Sales	Liquidity	0.136	0.179	0.764
Sales	#Investors	0.035	0.082	0.427
Sales	Change Team	0.361	0.971	0.372
Sales	Prize Won	0.690	1.257	0.549
Sales	#Start-Ups	0.007	0.014	0.470
Sales	Closes/Entries	-0.004	0.104	-0.041
Sales	HHI	0.163	0.199	0.820
Sales	Growth	-0.121	0.142	-0.857
Sales	IMR nonresp	-0.731	1.767	-0.414
Sales	IMR attrition	0.597	0.214	2.794
Sales	CF MMMR Res	0.109	0.215	0.507
Sales	CF PSR Res	0.042	0.108	0.392
Cust	MMMR	0.003	0.005	0.552
Cust	PSR	0.003	0.004	0.768
Cust	Venture_Age	0.960	0.549	1.747
Cust	Prio	-0.036	0.076	-0.473
Cust	Liquidity	-0.075	0.074	-1.014
Cust	#Investors	-0.007	0.028	-0.262
Cust	Change Team	0.371	0.484	0.766
Cust	Prize Won	0.222	0.245	0.906
Cust	#Start-Ups	0.000	0.005	0.068
Cust	Closes/Entries	0.016	0.041	0.405
Cust	HHI	-0.009	0.071	-0.129
Cust	Growth	0.039	0.057	0.683
Cust	IMR attrition	-0.004	0.087	-0.045
Cust	CF MMMR Res	0.019	0.076	0.250
Cust	CF PSR Re	-0.081	0.044	-1.823

Model 6: Moderated Results with IMR and CF:

		Coeff.	Bootsrapped se	Bootstrapped t-value
Sales	MMMR"	-0.002	0.014	-0.138
Sales	PSR	0.025	0.015	1.681
Sales	Venture_Age	1.164	1.296	0.898
Sales	MMMRxAge	0.004	0.004	1.175
Sales	PSRxAge	-0.012	0.006	-1.963
Sales	Prio	-0.068	0.222	-0.306
Sales	Liquidity	0.164	0.184	0.889
Sales	#Investors	0.047	0.084	0.561
Sales	Change Team	0.498	1.024	0.486
Sales	Prize Won	0.684	1.304	0.524
Sales	#Start-Ups	0.008	0.016	0.491
Sales	Closes/Entries	0.002	0.105	0.023
Sales	HHI	0.171	0.209	0.819
Sales	Growth	-0.148	0.147	-1.001
Sales	IMR nonresp	-0.451	1.767	-0.255
Sales	IMR attrition	0.624	0.219	2.848
Sales	CF MMMR Res	0.108	0.234	0.460
Sales	Sales Res	0.061	0.127	0.478
Cust	MMMR	0.008	0.004	1.958
Cust	PSR	-0.002	0.004	-0.520
Cust	Venture_Age	0.862	0.527	1.635
Cust	MMMRxAge	0.006	0.002	2.559
Cust	PSRxAge	-0.005	0.002	-2.107
Cust	Prio	-0.022	0.072	-0.306
Cust	Liquidity	-0.073	0.071	-1.033
Cust	#Investors	-0.005	0.027	-0.196
Cust	Change Team	0.470	0.474	0.991
Cust	Prize Won	0.244	0.234	1.044
Cust	#Start-Ups	0.001	0.005	0.168
Cust	Closes/Entries	0.012	0.039	0.318
Cust	HHI	-0.013	0.068	-0.195
Cust	Growth	0.034	0.055	0.627
Cust	IMR attrition	0.003	0.083	0.031
Cust	CF MMMR Res	0.022	0.074	0.297
Cust	CF PSR Re	-0.070	0.043	-1.623