AMERICAN SOCIOLOGICAL REVIEW

OFFICIAL JOURNAL OF THE AMERICAN SOCIOLOGICAL ASSOCIATION

ONLINE SUPPLEMENT
to article in
AMERICAN SOCIOLOGICAL REVIEW, 2015, VOL. 80

Ancestry Matters: Patrilineage Growth and Extinction

Xi Song
University of California, Los Angeles

Cameron D. Campbell
The Hong Kong University of Science and Technology

James Z. Lee
The Hong Kong University of Science and Technology

Table S1. Regressions of Patrilineal Male Descendant Stocks

	CMGPD-IL						CMGPD-LN				
Stock Model	t = 25	t = 50	t = 75	t = 100	t = 125	t = 150	t = 25	t = 50	t = 75	t = 100	t = 125
Linear Model											
Founder's status:	.286***	1.057***	1.927***	2.607***	3.098***	3.248***	.160***	.779***	1.321***	1.641***	1.862***
(Ref: low)	(.032)	(.074)	(.124)	(.176)	(.222)	(.250)	(.010)	(.025)	(.046)	(.065)	(.089)
Eldest brother	.063	.026	–.022	–.058	.111	–.026	.023*	.074**	.118*	.178**	.285**
	(.036)	(.083)	(.138)	(.196)	(.248)	(.278)	(.010)	(.026)	(.047)	(.066)	(.090)
Number of male	.018***	.040***	.082***	.128***	.181***	.197***	.010**	.036***	.079***	.078***	.066*
siblings	(.003)	(.007)	(.013)	(.018)	(.022)	(.025)	(.003)	(.008)	(.015)	(.021)	(.029)
Imperial Lineage	–.116***	–.417***	–.955***	–1.702***	–2.344***	–2.669***					
(Ref: Main Line)	(.031)	(.070)	(.117)	(.166)	(.210)	(.236)					
Population status							–.054***	–.163***	–.323***	–.259***	–.065
(Ref: Regular)							(.010)	(.026)	(.048)	(.068)	(.093)
Intercept	.463***	1.442***	2.043***	2.361***	2.319***	2.393***	.198***	.849***	1.272***	1.436***	1.548***
	(.036)	(.082)	(.136)	(.194)	(.245)	(.275)	(.011)	(.028)	(.051)	(.073)	(.099)
R-square	.047	.096	.125	.136	.139	.132	.016	.051	.046	.034	.023
N	3,314	3,314	3,314	3,314	3,314	3,314	18,997	18,997	18,997	18,997	18,997
Exponential Model											
Founder's status:	.224***	.500***	.655***	.734***	.747***	.739***	.144***	.504***	.627***	.646***	.613***
(Ref: low)	(.025)	(.034)	(.040)	(.044)	(.047)	(.048)	(.009)	(.015)	(.020)	(.021)	(.023)
Eldest brother	.057*	–.006	–.026	–.052	–.022	–.050	.020*	.062***	.085***	.095***	.108***
	(.028)	(.038)	(.045)	(.049)	(.052)	(.053)	(.009)	(.016)	(.020)	(.022)	(.023)
Number of male	.013***	.015***	.022***	.026***	.030***	.028***	.010***	.022***	.034***	.028***	.022**
siblings	(.003)	(.003)	–.004	(.004)	(.005)	(.005)	(.003)	(.005)	(.006)	(.007)	(.007)
Imperial Lineage	–.084***	–.174***	–.263***	–.396***	–.525***	–.578***					
(Ref: Main Line)	(.024)	(.032)	(.038)	(.042)	(.044)	(.045)					
Population status							–.048***	–.058***	–.073***	–.018	.049*
(Ref: Regular)							(.009)	(.016)	(.020)	(.022)	(.024)
Intercept	–.581***	.061	.202***	.184***	.092	.039	–.813***	–.353***	–.259***	–.310***	–.391***
	(.028)	(.037)	(.044)	(.049)	(.051)	(.053)	(.010)	(.017)	(.022)	(.024)	(.025)
R-square	.045	.092	.118	.140	.154	.153	.017	.056	.054	.047	.038
N	3,314	3,314	3,314	3,314	3,314	3,314	18,997	18,997	18,997	18,997	18,997

Table S1. (Cont.)

	CMGPD-IL						CMGPD-LN				
Stock Model	*t* = 25	*t* = 50	*t* = 75	*t* = 100	*t* = 125	*t* = 150	*t* = 25	*t* = 50	*t* = 75	*t* = 100	*t* = 125
Poisson Model											
Founder's status:	.432***	.538***	.663***	.769***	.871***	.909***	.548***	.612***	.663***	.698***	.701***
(Ref: low)	(.046)	(.027)	(.022)	(.020)	(.020)	(.020)	(.032)	(.015)	(.012)	(.011)	(.010)
Eldest brother	.086	–.001	–.040	–.073**	–.043	–.106***	.091*	.068***	.069***	.091***	.131***
	(.054)	(.032)	(.027)	(.025)	(.025)	(.025)	(.037)	(.018)	(.014)	(.013)	(.013)
Number of male	.022***	.016***	.021***	.025***	.030***	.031***	.039***	.032***	.045***	.038***	.029***
siblings	(.004)	(.002)	(.002)	(.002)	(.002)	(.001)	(.011)	(.006)	(.004)	(.004)	(.004)
Imperial Lineage	–.192***	–.235***	–.375***	–.597***	–.824***	–.960***					
(Ref: Main Line)	(.046)	(.027)	(.023)	(.022)	(.023)	(.023)					
Population status							–.233***	–.161***	–.210***	–.140***	–.030*
(Ref: Regular)							(.041)	(.019)	(.016)	(.014)	(.013)
Intercept	–.719***	.389***	.746***	.892***	.898***	.923***	–1.601***	–.149***	.262***	.389***	.474***
	(.052)	(.030)	(.025)	(.023)	(.022)	(.022)	(.041)	(.020)	(.016)	(.015)	(.014)
Log-likelihood	–3465	–6234	–8584	–10645	–12212	–13179	–11828	–28487	–42792	–55003	–69692
N	3,314	3,314	3,314	3,314	3,314	3,314	18,997	18,997	18,997	18,997	18,997
Negative Binomial Model											
Founder's status:	.432***	.536***	.658***	.766***	.864***	.888***	.548***	.612***	.664***	.700***	.703***
(Ref: low)	(.050)	(.037)	(.043)	(.051)	(.061)	(.070)	(.035)	(.022)	(.029)	(.036)	(.045)
Eldest brother	.088	.005	–.038	–.070	–.051	–.110	.091*	.071**	.071**	.098**	.132**
	(.058)	(.043)	(.050)	(.059)	(.070)	(.079)	(.040)	(.024)	(.030)	(.037)	(.046)
Number of male	.022***	.016***	.020***	.026***	.029***	.026***	.040**	.035***	.052***	.047***	.039**
siblings	(.005)	(.004)	(.004)	(.005)	(.006)	(.007)	(.012)	(.008)	(.010)	(.012)	(.015)
Imperial Lineage	–.188***	–.225***	–.358***	–.583***	–.804***	–.922***					
(Ref: Main Line)	(.050)	(.037)	(.042)	(.050)	(.059)	(.068)					
Population status							–.232***	–.154***	–.197***	–.120**	–.012
(Ref: Regular)							(.044)	(.026)	(.032)	(.039)	(.047)
Intercept	–.723***	.385***	.743***	.880***	.902***	.950***	–1.602***	–.156***	.249***	.369***	.457***
	(.057)	(.042)	(.048)	(.057)	(.068)	(.077)	(.044)	(.027)	(.033)	(.042)	(.051)
Alpha	.256	.467	.952	1.533	2.290	3.051	.601	.741	2.027	3.531	5.641
Log-likelihood	–3446	–5841	–6875	–7054	–6782	–6474	–11740	–26854	–32193	–32266	–30813
N	3,314	3,314	3,314	3,314	3,314	3,314	18,997	18,997	18,997	18,997	18,997

Sources: China Multi-Generational Panel Dataset-Imperial Lineage (CMGPD-IL), China Multi-Generational Panel Dataset-Liaoning (CMGPD-LN).

Note: Standard errors of the coefficients are in parentheses.

*$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests).

Table S2. Regressions of Patrilineal Male Descendant Flows

	CMGPD-IL						CMGPD-LN				
Flow Model	$t = 25$	$t = 50$	$t = 75$	$t = 100$	$t = 125$	$t = 150$	$t = 25$	$t = 50$	$t = 75$	$t = 100$	$t = 125$
Linear Model											
Founder's status:	.286***	.771***	.870***	.679***	.491***	.150	.160***	.619***	.542***	.320***	.221***
(Ref: low)	(.032)	(.063)	(.077)	(.084)	(.092)	(.087)	(.010)	(.022)	(.028)	(.033)	(.043)
Eldest brother	.063	–.036	–.048	–.036	.169	–.137	.023*	.051*	.044	.059	.107*
	(.036)	(.070)	(.086)	(.094)	(.102)	(.097)	(.010)	(.022)	(.029)	(.033)	(.043)
Number of male	.018***	.022***	.042***	.046***	.053***	.016	.010**	.026***	.043***	–.001	–.012
siblings	(.003)	(.006)	(.008)	(.009)	(.009)	(.009)	(.003)	(.007)	(.009)	(.011)	(.014)
Imperial Lineage	–.116***	–.300***	–.539***	–.746***	–.643***	–.324***					
(Ref: Main Line)	(.031)	(.059)	(.073)	(.079)	(.087)	(.082)					
Population status							–.054***	–.110***	–.160***	.064	.194***
(Ref: Regular)							(.010)	(.023)	(.029)	(.034)	(.044)
Descendants at $t - 1$		offset	offset	offset	offset	offset		offset	offset	offset	offset
Intercept	.463***	.979***	.601***	.318***	–.041	.074	.198***	.651***	.423***	.164***	.111*
	(.036)	(.069)	(.085)	(.093)	(.101)	(.096)	(.011)	(.024)	(.031)	(.036)	(.047)
R-square	.047	.068	.082	.073	.047	.010	.016	.044	.022	.005	.003
N	3,314	3,314	3,314	3,314	3,314	3,314	18,997	18,997	18,997	18,997	18,997
Exponential Model											
Founder's status:	.224***	.276***	.155***	.079***	.013	–.008	.144***	.359***	.123***	.019*	–.033***
(Ref: low)	(.025)	(.031)	(.024)	(.022)	(.022)	(.021)	(.009)	(.013)	(.010)	(.009)	(.010)
Eldest brother	.057*	–.062	–.020	–.027	.030	–.028	.020*	.042**	.022*	.010	.014
	(.028)	(.035)	(.027)	(.024)	(.025)	(.024)	(.009)	(.014)	(.010)	(.009)	(.010)
Number of male	.013***	.001	.007**	.005*	.004	–.002	.010***	.012**	.012***	–.006*	–.006
siblings	(.003)	(.003)	(.002)	(.002)	(.002)	(.002)	(.003)	(.004)	(.003)	(.003)	(.003)
Imperial Lineage	–.084***	–.090**	–.088***	–.134***	–.128***	–.053**					
(Ref: Main Line)	(.024)	(.030)	(.023)	(.021)	(.021)	(.020)					
Population status							–.048***	–.011	–.014	.054***	.068***
(Ref: Regular)							(.009)	(.014)	(.010)	(.010)	(.010)
Descendants at $t - 1$		offset	offset	offset	offset	offset		offset	offset	offset	offset
Intercept	–.581***	.642***	.141***	–.018	–.092***	–.053*	–.813***	.460***	.094***	–.051***	.081***
	(.028)	(.034)	(.026)	(.024)	(.024)	(.023)	(.010)	(.015)	(.011)	(.010)	(.011)
R-square	.045	.031	.027	.024	.015	.002	.017	.038	.009	.003	.004
N	3,314	3,314	3,314	3,314	3,314	3,314	18,997	18,997	18,997	18,997	18,997

Table S2. (Cont.)

	CMGPD-IL						CMGPD-LN				
	$t = 25$	$t = 50$	$t = 75$	$t = 100$	$t = 125$	$t = 150$	$t = 25$	$t = 50$	$t = 75$	$t = 100$	$t = 125$
Poisson Model											
Founder's status:	.432***	.267***	.179***	.149***	.153***	.098***	.548***	.410***	.186***	.135***	.096***
(Ref: low)	(.046)	(.027)	(.022)	(.021)	(.020)	(.020)	(.032)	(.015)	(.012)	(.011)	(.010)
Eldest brother	.086	–.046	–.040	–.035	.024	–.070**	.091*	.035*	.024	.036**	.056***
	(.054)	(.046)	(.027)	(.025)	(.025)	(.025)	(.037)	(.018)	(.014)	(.013)	(.013)
Number of male	.022***	.001	.005**	.005**	.006***	.001	.039***	.020***	.021***	.001	–.003
siblings	(.004)	(.002)	(.002)	(.002)	(.001)	(.001)	(.011)	(.006)	(.004)	(.004)	(.004)
Imperial Lineage	–.192***	–.103***	–.160***	–.242***	–.264***	–.200***					
(Ref: Main Line)	(.046)	(.027)	(.023)	(.022)	(.023)	(.023)					
Population status							–.233***	–.081***	–.061***	.053***	.102***
(Ref: Regular)							(.041)	(.019)	(.016)	(.014)	(.013)
Descendants at $t - 1$		offset	offset	offset	offset	offset		offset	offset	offset	offset
Intercept	–.719***	.717***	.280***	.088***	–.055*	–.046*	–1.601***	.533***	.195***	–.030*	–.067***
	(.052)	(.031)	(.025)	(.022)	(.022)	(.022)	(.041)	(.020)	(.016)	(.015)	(.014)
Log-likelihood	–3465	–5692	–5344	–4994	–4710	–4449	–11828	–24899	–23529	–22537	–22749
N	3,314	3,314	3,314	3,314	3,314	3,314	18,997	18,997	18,997	18,997	18,997
Negative Binomial Model											
Founder's status:	.432***	.315***	.194***	.153***	.159***	.110***	.548***	.459***	.203***	.172***	.172***
(Ref: low)	(.050)	(.035)	(.025)	(.023)	(.025)	(.025)	(.035)	(.018)	(.014)	(.014)	(.016)
Eldest brother	.088	–.065	–.040	–.036	.016	–.063*	.091*	.048**	.033*	.048**	.070***
	(.058)	(.041)	(.030)	(.028)	(.030)	(.031)	(.040)	(.021)	(.016)	(.016)	(.019)
Number of male	.022***	.001	.006**	.005**	.005**	.001	.040**	.022***	.023***	.004	.002
siblings	(.005)	(.003)	(.002)	(.002)	(.002)	(.002)	(.012)	(.007)	(.005)	(.005)	(.006)
Imperial Lineage	–.188***	–.107**	–.156***	–.238***	–.264***	–.188***					
(Ref: Main Line)	(.050)	(.035)	(.026)	(.024)	(.026)	(.027)					
Population status							–.232***	–.080***	–.056**	.068***	.132***
(Ref: Regular)							(.044)	(.022)	(.017)	(.017)	(.019)
Descendants at $t - 1$		offset	offset	offset	offset	offset	offset	offset	offset	offset	offset
Intercept	–.723***	.776***	.267***	.068**	–.075**	–.079**	–1.602***	.514***	.157***	–.121***	–.261***
	(.057)	(.040)	(.029)	(.026)	(.027)	(.028)	(.044)	(.023)	(.018)	(.019)	(.022)
Alpha	.256	.264	.065	.039	.059	.058	.601	.231	.066	.116	.252
Log-likelihood	–3446	–5533	–5307	–4972	–4657	–4404	–11740	–24635	–23427	–22138	–21378
N	3,314	3,314	3,314	3,314	3,314	3,314	18,997	18,997	18,997	18,997	18,997

Sources: China Multi-Generational Panel Dataset-Imperial Lineage (CMGPD-IL), China Multi-Generational Panel Dataset-Liaoning (CMGPD-LN).
Note: Standard errors of the coefficients are in parentheses.
*$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests).

Table S3. Mixture Negative Binomial Regressions of Number of Patrilineal Male Descendants

	CMGPD-IL						CMGPD-LN				
Stock Model: $P(N(t))$											
	t = 25	t = 50	t = 75	t = 100	t = 125	t = 150	t = 25	t = 50	t = 75	t = 100	t = 125
Logistic model: $N(t)$> 0 (survival = 1)											
Founder's status:	.575***	1.126***	1.185***	1.116***	.981***	.970***	.659***	1.153***	1.123***	1.058***	.974***
(Ref: low)	(.077)	(.101)	(.099)	(.089)	(.082)	(.080)	(.041)	(.041)	(.039)	(.038)	(.037)
Eldest brother	.154	–.137	–.086	–.110	–.025	–.079	.101*	.175***	.174***	.165***	.193***
	(.087)	(.096)	(.095)	(.091)	(.089)	(.090)	(.046)	(.038)	(.038)	(.039)	(.040)
Number of male	.033***	.021*	.028**	.032***	.039***	.040***	.055***	.039**	.039**	.025*	.027*
siblings	(.008)	(.010)	(.010)	(.009)	(.009)	(.009)	(.014)	(.012)	(.012)	(.012)	(.013)
Imperial Lineage	–.185*	–.339***	–.287***	–.340***	–.514***	–.638***					
(Ref: Main Line)	(.073)	(.082)	(.081)	(.077)	(.074)	(.075)					
Population status							–.246***	.085*	.054	.075	.127**
(Ref: Regular)							(.050)	(.039)	(.039)	(.039)	(.040)
Intercept	–.603***	.760***	.557***	.265**	–.060	–.255**	–1.606***	–.287***	–.454***	–.707***	–1.016***
	(.086)	(.098)	(.096)	(.092)	(.089)	(.088)	(.051)	(.042)	(.042)	(.042)	(.044)
N	3,314	3,314	3,314	3,314	3,314	3,314	18,997	18,997	18,997	18,997	18,997
Truncated negative binomial: $N(t) \mid N(t) > 0$											
Founder's status:	.352***	.431***	.484***	.543***	.606***	.568***	.254**	.307***	.243***	.211***	.168***
(Ref: low)	(.090)	(.049)	(.048)	(.055)	(.062)	(.068)	(.079)	(.027)	(.023)	(.027)	(.033)
Eldest brother	.008	.062	–.020	–.039	–.044	–.078	.070	–.019	–.021	.003	.014
	(.107)	(.059)	(.057)	(.066)	(.075)	(.082)	(.097)	(.032)	(.027)	(.033)	(.039)
Number of male	.018*	.017***	.018***	.021***	.020***	.017**	–.018	.031**	.038***	.035***	.018
siblings	(.008)	(.005)	(.004)	(.005)	(.006)	(.006)	(.031)	(.010)	(.009)	(.010)	(.012)
Imperial Lineage	–.227*	–.205***	–.371***	–.617***	–.766***	–.793***					
(Ref: Main Line)	(.094)	(.050)	(.048)	(.056)	(.064)	(.071)					
Population status							–.214	–.400***	–.325***	–.227***	–.128***
(Ref: Regular)							(.112)	(.036)	(.029)	(.033)	(.039)
Intercept	–.700***	.324***	.894***	1.119***	1.278***	1.435***	–1.497***	.162***	.944***	1.221***	1.507***
	(.146)	(.064)	(.058)	(.068)	(.075)	(.082)	(.213)	(.040)	(.032)	(.038)	(.046)
N	1,419	2,374	2,306	2,088	1,801	1,592	3,975	10,247	9,423	8,111	6,820
Log-likelihood	–3,423	–5,775	–6,802	–6,977	–6,704	–6,387	–11,730	–26,660	–31,630	–31,700	–30,310
Vuong Test	0.80	3.20***	3.46***	3.96***	4.53***	5.69***	2.44**	9.93***	17.52***	17.73***	16.81***

Table S3. (Cont.)

	CMGPD-IL						CMGPD-LN				
Flow Model:											
$P(N(t)\|N(t\text{-}1)>0)$	t = 25	t = 50	t = 75	t = 100	t = 125	t = 150	t = 25	t = 50	t = 75	t = 100	t = 125
Logistic model: $N(t) > 0 \mid N(t\text{-}1) > 0$											
Founder's status:	.575***	.728***	.632***	.585***	.381**	.533***	.659***	.702***	.411***	.401***	.219**
(Ref: low)	(.077)	(.201)	(.171)	(.151)	(.135)	(.152)	(.041)	(.140)	(.081)	(.072)	(.069)
Eldest brother	.154	.179	.032	–.105	.188	–.093	.101*	.447***	.010	.036	.178*
	(.087)	(.211)	(.179)	(.158)	(.155)	(.165)	(.046)	(.131)	(.087)	(.076)	(.078)
Number of male	.033***	.015	.049*	.049**	.046**	.056**	.055***	.034	.043	–.034	.023
siblings	(.008)	(.020)	(.020)	(.018)	(.016)	(.019)	(.014)	(.044)	(.028)	(.024)	(.026)
Imperial Lineage	–.185*	–.780***	–.137	–.345*	–.715***	–.788***					
(Ref: Main Line)	(.073)	(.185)	(.152)	(.138)	(.131)	(.145)					
Population status							–.246***	.327	–.144	.093	.237**
(Ref: Regular)							(.050)	(.168)	(.083)	(.080)	(.084)
Descendants at $t-1$		control	control	control	control	control		control	control	control	control
Intercept	–.603***	2.146***	1.973***	1.830***	1.684***	1.739***	–1.606***	1.659***	2.056***	1.718***	1.399***
	(.086)	(.225)	(.180)	(.168)	(.161)	(.180)	(.051)	(.143)	(.097)	(.086)	(.087)
N	3,314	1,419	2,374	2,306	2,088	1,801	18,997	3,975	10,247	9,423	8,111
Truncated negative binomial: $N(t) \mid N(t) > 0, N(t\text{-}1) > 0$											
Founder's status:	.352***	.252***	.145***	.102***	.102***	.037	.254**	.195***	.056***	.031*	.001
(Ref: low)	(.090)	(.050)	(.029)	(.025)	(.025)	(.026)	(.079)	(.027)	(.014)	(.013)	(.013)
Eldest brother	.008	.033	–.029	–.021	.010	–.057	.070	–.062	.001	.027	.031
	(.107)	(.058)	(.035)	(.030)	(.031)	(.032)	(.097)	(.032)	(.016)	(.016)	(.016)
Number of male	.018*	.006	.006*	.004*	.003	–.001	–.018	.020	.018***	.002	–.007
siblings	(.008)	(.004)	(.002)	(.002)	(.002)	(.002)	(.031)	(.010)	(.005)	(.005)	(.005)
Imperial Lineage	–.227*	–.051	–.173***	–.244***	–.223***	–.116***					
(Ref: Main Line)	(.094)	(.052)	(.030)	(.026)	(.028)	(.029)					
Population status							–.214	–.201***	–.088***	.053**	.114***
(Ref: Regular)							(.112)	(.039)	(.019)	(.017)	(.017)
Descendants at $t-1$		offset	offset	offset	offset	offset		offset	offset	offset	offset
Intercept	–.700***	.489***	.304***	.132***	.021	.022	–1.497***	.671***	.386***	.131***	.127***
	(.146)	(.059)	(.033)	(.027)	(.028)	(.028)	(.213)	(.036)	(.019)	(.018)	(.019)
N	1,419	1,261	2,306	2,088	1,801	1,592	3,975	3,584	9,423	8,111	6,820
Log-likelihood	–3,423	–2,814	–4,745	–4,679	–4,388	–3,939	–11,730	–7,137	–18,900	–19,040	–17,800
Vuong Test	.80	.42	2.98**	7.77***	9.88***	10.07***	2.44**	1.39	7.04***	13.48***	3.80***

Sources: China Multi-Generational Panel Dataset-Imperial Lineage (CMGPD-IL), China Multi-Generational Panel Dataset-Liaoning (CMGPD-LN).

Note: The Vuong test statistics compare mixture negative binomial models with the corresponding negative binomial models in Tables S1 and S2. Standard errors of the coefficients are in parentheses.

*p < .05; **p < .01; ***p < .001 (two-tailed tests).

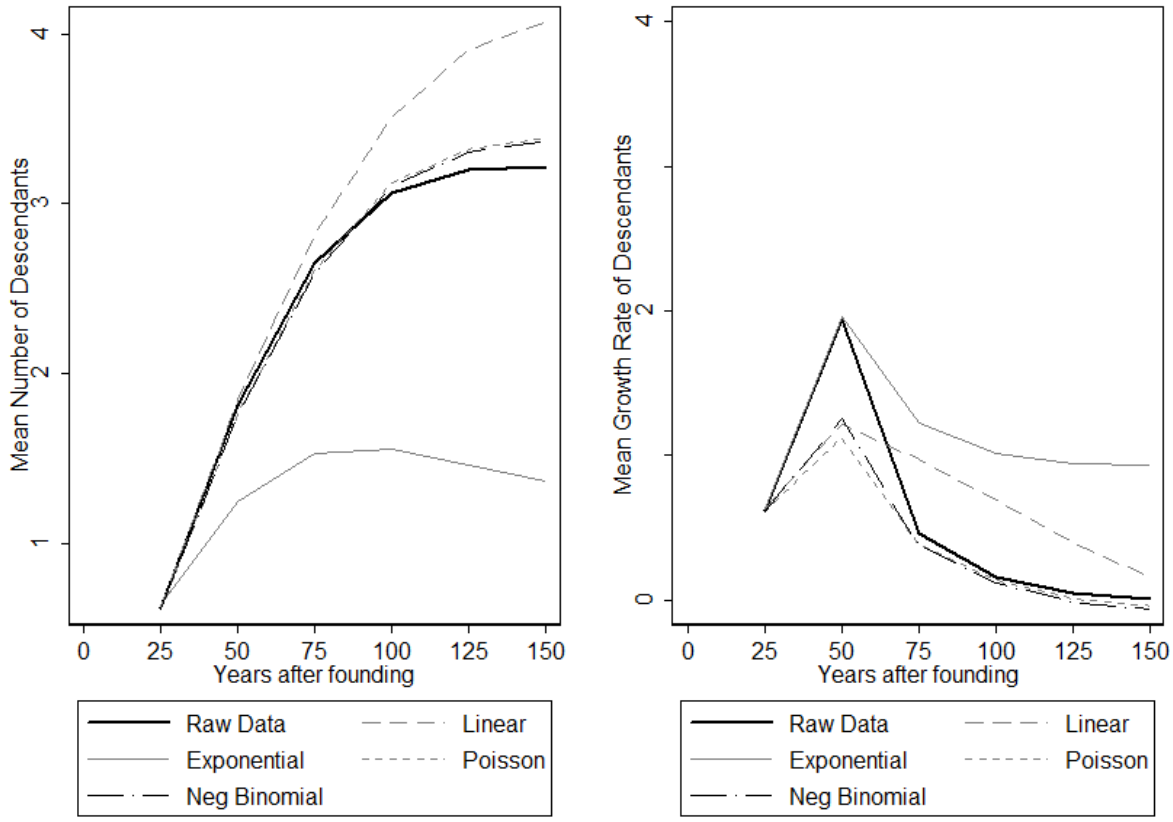

Figure S1. Predicted Growth and Growth Rate of Different Regression Models: CMGPD-IL

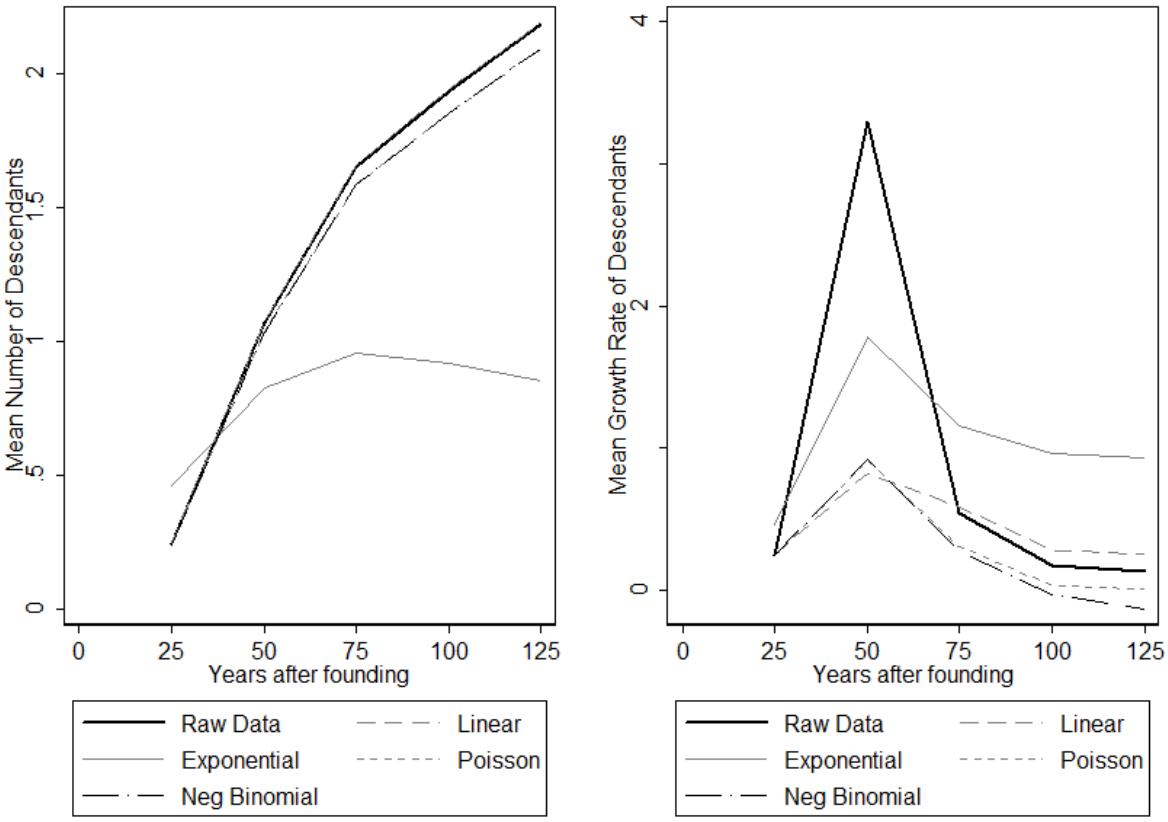

Figure S2. Predicted Growth and Growth Rate of Different Regression Models: CMGPD-LN