

Appendices A and B: Web Tables for

The Knowledge Production Function for University Patenting

Paula E. Stephan, Grant C. Black and Shiferaw Gormu

December 2007

(Not for Publication)

Appendix A
Web Tables – Additional Results for all, Private and Public Institutions
(Not for Publication)

**Table A1. Estimation Results from Individual Effects Model for all Institutions and Fields with
Private Institution Dummy (1985-1999)**
Dependent Variable: Patent Issued to Academic Institutions in all Fields

Variable	Coefficient Estimate (t-ratio)				
	Spec 1	Spec 2	Spec 3	Spec 4	Spec 5
Computer & Communications	-1.1286***	-1.1117***	-1.0909***	-1.0854***	-1.0537***
	(8.68)	(8.57)	(8.56)	(8.49)	(8.23)
Drugs & Medical	-0.5054***	-0.5385***	-0.5035***	-0.5375***	-0.5273***
	(4.13)	(4.39)	(4.21)	(4.45)	(4.42)
Electrical, Electronic & Mechanical	-0.8882***	-0.8754***	-0.9877***	-0.9474***	-0.9347***
	(7.42)	(7.30)	(8.35)	(7.94)	(7.91)
Other Field	-1.7008***	-1.6865***	-1.7219***	-1.7023***	-1.6889***
	(12.97)	(12.88)	(13.40)	(13.20)	(13.23)
Log Stock of R&D Expenditure	0.3317***	0.3245***	0.3003***	0.3017***	
	(11.93)	(11.73)	(10.69)	(10.75)	
Log R&D Expenditure_4					0.2042***
					(4.73)
Log R&D Expenditure_5					0.0904**
					(2.15)
Log faculty_4	0.0349	0.0180	0.0215	0.0095	0.0043
	(0.95)	(0.50)	(0.59)	(0.26)	(0.12)
All Postdocs_4		0.1125***		0.1012***	0.0992***
		(7.64)		(6.72)	(6.59)
Stock of All PhDs			0.1278***	0.0937***	0.0963***
			(4.72)	(3.43)	(3.54)
Technology Transfer Office	0.3252***	0.3477***	0.3272***	0.3469***	0.3433***
	(8.09)	(8.67)	(8.17)	(8.67)	(8.58)
Top 110 Institution	0.7562***	0.7355***	0.6991***	0.6961***	0.6876***
	(7.57)	(7.38)	(7.12)	(7.07)	(7.02)
Private Institution	0.2830***	0.2749***	0.2872***	0.2752***	0.2857***
	(3.33)	(3.21)	(3.45)	(3.27)	(3.41)
Minus log likelihood	11626	11599	11615	11594	11586
AIC	23306	23255	23286	23245	23232

BIC	23504	23460	23491	23457	23451
-----	-------	-------	-------	-------	-------

Notes:

(a) Absolute value of t statistics within parentheses.

(b) *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.

(c) All specifications control for year effects.

(d) Results for postdoc and PhD variables are expressed in 100s.

Table A1 continued

Variable	Coefficient Estimate (t-ratio)					
	Spec 6	Spec 7	Spec 8	Spec 9	Spec 10	Spec 11
Computer & Communications	-1.1109***	-1.0911***	-1.0816***	-1.0766***	-1.0804***	-1.0481***
	(8.56)	(8.57)	(8.49)	(8.43)	(8.45)	(8.19)
Drugs & Medical	-0.5313***	-0.5017***	-0.5284***	-0.5421***	-0.5383***	-0.5274***
	(4.32)	(4.17)	(4.39)	(4.46)	(4.42)	(4.38)
Electrical, Electronic & Mechanical	-0.8771***	-0.9895***	-0.9595***	-0.9291***	-0.9410***	-0.9256***
	(7.32)	(8.33)	(8.07)	(7.75)	(7.83)	(7.77)
Other Field	-1.6883***	-1.7219***	-1.7241***	-1.7041***	-1.7029***	-1.6881***
	(12.90)	(13.40)	(13.42)	(13.23)	(13.21)	(13.23)
Log Stock of R&D Expenditure	0.3270***	0.3006***	0.3009***	0.3058***	0.3097***	
	(11.75)	(10.67)	(10.72)	(10.80)	(10.88)	
Log R&D Expenditure_4						0.2067***
						(4.78)
Log R&D Expenditure_5						0.0942**
						(2.23)
Log faculty_4	0.0173	0.0213	0.0309	0.0190	0.0152	0.0107
	(0.48)	(0.58)	(0.84)	(0.52)	(0.42)	(0.29)
US and Permanent Resident Postdocs_4	0.0755			0.0849*	0.0932*	0.0908*
	(1.55)			(1.78)	(1.95)	(1.90)
Temporary Resident Postdocs_4	0.1307***			0.1168***	0.1125***	0.1111***
	(4.80)			(4.17)	(4.01)	(3.96)
Stock of US PhDs		0.1213**			0.0669	0.0733
		(2.51)			(1.28)	(1.41)
Stock of International PhDs		0.1346***				
		(2.74)				

Stock of US & Permanent resident PhDs			0.1899***	0.1005**		
			(4.19)	(2.14)		
Stock of Permanent Resident PhDs					0.3303**	0.2979*
					(2.05)	(1.85)
Stock of Temporary Resident PhDs			-0.0001	0.0423	0.0171	0.0255
			(0.00)	(0.60)	(0.24)	(0.35)
Stock of Other PhDs			0.2676***	0.3168***	0.3096***	0.3187***
			(3.19)	(4.03)	(3.86)	(3.98)
Technology Transfer Office	0.3492***	0.3267***	0.3389***	0.3568***	0.3550***	0.3517***
	(8.70)	(8.14)	(8.41)	(8.86)	(8.80)	(8.73)
Top 110 Institution	0.7366***	0.6996***	0.6872***	0.6896***	0.6938***	0.6857***
	(7.39)	(7.12)	(7.00)	(7.00)	(7.03)	(6.99)
Private Institution	0.2762***	0.2875***	0.2755***	0.2651***	0.2654***	0.2759***
	(3.23)	(3.45)	(3.29)	(3.14)	(3.14)	(3.28)
Minus log likelihood	11599	11615	11612	11589	11588	11580
AIC	23256	23288	23283	23242	23242	23229
BIC	23468	23500	23502	23477	23484	23478

Notes:

(a) Absolute value of t statistics within parentheses.

(b) *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.

(c) All specifications control for year effects.

(d) Results for postdoc and PhD variables are expressed in 100s.

**Table A2. Estimation Results from Individual Effects Model for Private Institutions and Fields
(1985-1999)
Dependent Variable: Patent Issued to Academic Institutions in all Fields**

Variable	Coefficient Estimate (t-ratio)				
	Spec 1	Spec 2	Spec 3	Spec 4	Spec 5
Computer & Communications	-0.7192*** (3.70)	-0.7096*** (3.66)	-0.6925*** (3.69)	-0.6903*** (3.66)	-0.6672*** (3.55)
Drugs & Medical	-0.5113*** (2.74)	-0.5791*** (3.09)	-0.5118*** (2.84)	-0.5703*** (3.13)	-0.5522*** (3.08)
Electrical, Electronic & Mechanical	-0.7608*** (4.17)	-0.7356*** (4.01)	-0.9908*** (5.56)	-0.9235*** (5.10)	-0.8990*** (5.02)
Other Field	-1.6346*** (8.15)	-1.6266*** (8.14)	-1.6972*** (8.78)	-1.6762*** (8.63)	-1.6607*** (8.63)
Log Stock of R&D Expenditure	0.3667*** (8.84)	0.3576*** (8.67)	0.3119*** (7.55)	0.3148*** (7.60)	
Log R&D Expenditure_4					0.1690*** (2.68)
Log R&D Expenditure_5					0.1386** (2.23)
Log faculty_4	0.0367 (0.65)	0.0036 (0.06)	0.0131 (0.24)	-0.0104 (0.19)	-0.0152 (0.28)
All Postdocs_4		0.0950*** (6.06)		0.0767*** (4.74)	0.0757*** (4.68)
Stock of All PhDs			0.2222*** (5.10)	0.1731*** (4.04)	0.1695*** (3.99)
Technology Transfer Office	0.4290*** (5.83)	0.4548*** (6.20)	0.4799*** (6.47)	0.4868*** (6.59)	0.4829*** (6.54)
Top 110 Institution	0.6400*** (3.70)	0.6046*** (3.51)	0.5573*** (3.35)	0.5493*** (3.29)	0.5413*** (3.27)
Minus log likelihood	5010	4994	4996	4986	4983
AIC	10073	10042	10047	10027	10023
BIC	10238	10214	10218	10205	10207

Notes:

- (a) Absolute value of t statistics within parentheses.
- (b) *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.
- (c) All specifications control for year effects.
- (d) Results for postdoc and PhD variables are expressed in 100s.

Table A2 continued

Variable	Coefficient Estimate (t-ratio)					
	Spec 6	Spec 7	Spec 8	Spec 9	Spec 10	Spec 11
Computer & Communications	-0.7105***	-0.6920***	-0.6862***	-0.6797***	-0.6899***	-0.6643***
	(3.66)	(3.70)	(3.65)	(3.61)	(3.66)	(3.54)
Drugs & Medical	-0.5635***	-0.4992***	-0.5322***	-0.5686***	-0.5601***	-0.5400***
	(2.99)	(2.76)	(2.93)	(3.10)	(3.04)	(2.97)
Electrical, Electronic & Mechanical	-0.7394***	-0.9990***	-0.9559***	-0.8899***	-0.9063***	-0.8780***
	(4.03)	(5.60)	(5.29)	(4.85)	(4.93)	(4.83)
Other Field	-1.6299***	-1.6981***	-1.6959***	-1.6754***	-1.6721***	-1.6554***
	(8.15)	(8.79)	(8.76)	(8.64)	(8.61)	(8.61)
Log Stock of R&D Expenditure	0.3617***	0.3146***	0.3139***	0.3210***	0.3269***	
	(8.72)	(7.60)	(7.58)	(7.66)	(7.77)	
Log R&D Expenditure_4						0.1700***
						(2.68)
Log R&D Expenditure_5						0.1460**
						(2.33)
Log faculty_4	-0.0001	0.0129	0.0173	-0.0055	-0.0142	-0.0174
	(0.00)	(0.23)	(0.31)	(0.10)	(0.25)	(0.31)
US and Permanent Resident Postdocs_4	0.0497			0.0654	0.0823	0.0825
	(0.90)			(1.21)	(1.51)	(1.51)
Temporary Resident Postdocs_4	0.1166***			0.0904***	0.0841***	0.0831***
	(3.90)			(2.92)	(2.71)	(2.68)
Stock of US PhDs		0.1870***			0.1038	0.1056
		(2.96)			(1.46)	(1.49)
Stock of International PhDs		0.2724***				
		(3.57)				
Stock of US & Permanent Resident PhDs			0.2577***	0.1630**		
			(4.25)	(2.56)		
Stock of Permanent Resident PhDs					0.5486**	0.4824**
					(2.49)	(2.18)
Stock of Temporary Resident PhDs			0.0947	0.1292	0.0957	0.1083
			(0.69)	(1.00)	(0.71)	(0.80)
Stock of Other PhDs			0.2941***	0.3344***	0.3203***	0.3312***
			(2.85)	(3.60)	(3.25)	(3.39)
Technology Transfer Office	0.4584***	0.4820***	0.4814***	0.4942***	0.4908***	0.4881***
	(6.24)	(6.50)	(6.48)	(6.68)	(6.63)	(6.60)
Top 110 Institution	0.6067***	0.5574***	0.5546***	0.5458***	0.5529***	0.5462***
	(3.52)	(3.36)	(3.33)	(3.27)	(3.30)	(3.29)
Minus log likelihood	4994	4996	4995	4984	4982	4979

AIC	10044	10048	10049	10030	10029	10025
BIC	10221	10226	10233	10227	10232	10234

Notes:

- (a) Absolute value of t statistics within parentheses.
- (b) *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.
- (c) All specifications control for year effects.
- (d) Results for postdoc and PhD variables are expressed in 100s.

**Table A3. Estimation Results from Individual Effects Model for Public Institutions and Fields
(1985-1999)
Dependent Variable: Patent Issued to Academic Institutions in all Fields**

Variable	Coefficient Estimate (t-ratio)				
	Spec 1	Spec 2	Spec 3	Spec 4	Spec 5
Computer & Communications	-1.4662***	-1.4400***	-1.4497***	-1.4376***	-1.4034***
	(8.37)	(8.23)	(8.30)	(8.20)	(7.97)
Drugs & Medical	-0.4774***	-0.5375***	-0.4778***	-0.5371***	-0.5344***
	(2.94)	(3.30)	(2.97)	(3.30)	(3.32)
Electrical, Electronic & Mechanical	-1.0015***	-0.9742***	-1.0180***	-0.9767***	-0.9719***
	(6.33)	(6.15)	(6.44)	(6.14)	(6.17)
Other Field	-1.7709***	-1.7142***	-1.7725***	-1.7147***	-1.7078***
	(10.16)	(9.85)	(10.23)	(9.86)	(9.96)
Log Stock of R&D Expenditure	0.3081***	0.2807***	0.2976***	0.2793***	
	(7.98)	(7.26)	(7.51)	(7.05)	
Log R&D Expenditure_4					0.2235***
					(3.84)
Log R&D Expenditure_5					0.0502
					(0.89)
Log faculty_4	0.1327**	0.0938	0.1253**	0.0930	0.0917
	(2.13)	(1.51)	(2.01)	(1.49)	(1.47)
All Postdocs_4		0.2606***		0.2592***	0.2508***
		(5.71)		(5.59)	(5.38)
Stock of All PhDs			0.0406	0.0060	0.0133
			(1.09)	(0.16)	(0.35)
Technology Transfer Office	0.3209***	0.3434***	0.3166***	0.3427***	0.3379***
	(6.52)	(6.98)	(6.42)	(6.94)	(6.84)
Top 110 Institution	0.7948***	0.7843***	0.7755***	0.7815***	0.7690***
	(6.33)	(6.27)	(6.16)	(6.19)	(6.13)
Minus log likelihood	6578	6563	6577	6563	6559
AIC	13208	13181	13209	13183	13175
BIC	13385	13365	13393	13374	13373

Notes:

- (a) Absolute value of t statistics within parentheses.
- (b) *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.
- (c) All specifications control for year effects.
- (d) Results for postdoc and PhD variables are expressed in 100s.

Table A3 continued

Variable	Coefficient Estimate (t-ratio)					
	Spec 6	Spec 7	Spec 8	Spec 9	Spec 10	Spec 11
Computer & Communications	-1.4297***	-1.4531***	-1.4382***	-1.4202***	-1.4177***	-1.3834***
	(8.17)	(8.31)	(8.25)	(8.12)	(8.11)	(7.88)
Drugs & Medical	-0.5213***	-0.4697***	-0.4934***	-0.5251***	-0.5269***	-0.5249***
	(3.20)	(2.90)	(3.05)	(3.22)	(3.23)	(3.25)
Electrical, Electronic & Mechanical	-0.9720***	-1.0296***	-1.0106***	-0.9795***	-0.9684***	-0.9612***
	(6.14)	(6.45)	(6.37)	(6.13)	(6.04)	(6.06)
Other Field	-1.7061***	-1.7714***	-1.7773***	-1.7060***	-1.7051***	-1.6984***
	(9.80)	(10.23)	(10.28)	(9.83)	(9.83)	(9.93)
Log Stock of R&D Expenditure	0.2831***	0.2996***	0.2955***	0.2812***	0.2777***	
	(7.32)	(7.52)	(7.47)	(7.11)	(6.98)	
Log R&D Expenditure_4						0.2241***
						(3.86)
Log R&D Expenditure_5						0.0474
						(0.84)
Log faculty_4	0.0897	0.1250**	0.1492**	0.1168*	0.1186*	0.1173*
	(1.44)	(2.00)	(2.37)	(1.86)	(1.89)	(1.87)
US and Permanent Resident Postdocs_4	0.1105			0.1438	0.1358	0.1224
	(0.95)			(1.24)	(1.17)	(1.05)
Temporary Resident Postdocs_4	0.4111***			0.4279***	0.4447***	0.4388***
	(3.56)			(3.67)	(3.75)	(3.70)
Stock of US PhDs		0.0058			0.0013	0.0170
		(0.07)			(0.02)	(0.21)
Stock of International PhDs		0.0678				
		(1.03)				
Stock of US & Permanent Resident PhDs			0.0728	-0.0238		
			(0.99)	(0.32)		
Stock of Permanent Resident PhDs					-0.1929	-0.1784
					(0.80)	(0.74)
Stock of Temporary Resident PhDs			-0.0018	0.0267	0.0461	0.0434
			(0.02)	(0.30)	(0.50)	(0.47)
Stock of Other PhDs			0.5024***	0.6056***	0.6202***	0.6224***
			(2.70)	(3.30)	(3.36)	(3.38)

Technology Transfer Office	0.3421***	0.3145***	0.3218***	0.3469***	0.3485***	0.3439***
	(6.95)	(6.35)	(6.51)	(7.00)	(7.03)	(6.94)
Top 110 Institution	0.7868***	0.7802***	0.7495***	0.7627***	0.7583***	0.7456***
	(6.29)	(6.18)	(5.94)	(6.04)	(6.00)	(5.93)
Minus log likelihood	6562	6577	6574	6557	6557	6552
AIC	13181	13210	13206	13176	13177	13170
BIC	13372	13402	13404	13388	13396	13395

Notes:

- (a) Absolute value of t statistics within parentheses.
- (b) *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.
- (c) All specifications control for year effects.
- (d) Results for postdoc and PhD variables are expressed in 100s.

Appendix B
Web Tables – Summary Statistics and Results by Major Academic Fields
(Not for Publication)

Table B1. Means (Standard Deviations) by Academic Field (1985–1999)

Variable	Chemical	Computer & Communications	Drugs & Medical	Electrical, Electronics & Mechanical	Other Fields
Patents Issued	1.835 (3.21)	0.675 (2.22)	2.797 (5.70)	1.664 (4.37)	0.385 (0.99)
R & D Expenditure	15259.81 (16864.44)	11093.111 (29432.12)	110000.00 (151000.0)	61521.551 (120000.0)	64948.482 (91209.31)
Stock of R&D Expenditure	5131.007 (5309.59)	3985.465 (9782.58)	39901.858 (54225.14)	21180.624 (38220.94)	21607.013 (28850.52)
Faculty	936.457 (539.69)	998.395 (544.83)	947.467 (536.70)	949.669 (543.94)	926.078 (540.91)
All Postdocs	19.776 (23.38)	0.95 (3.07)	94.032 (214.64)	17.564 (23.80)	9.198 (16.20)
US and Permanent Resident Postdocs	7.061 (10.26)	0.501 (1.61)	51.119 (117.93)	7.196 (12.12)	5.389 (10.33)
International Postdocs	12.715 (14.88)	0.449 (1.82)	42.913 (101.22)	10.368 (14.00)	3.81 (6.93)
Stock of All PhDs ^a	49.571 (50.34)	17.151 (22.35)	85.318 (86.55)	99.808 (138.55)	68.047 (83.43)
Stock of US PhDs	29.333 (32.84)	7.873 (10.89)	61.427 (62.74)	41.578 (63.47)	40.681 (49.52)
Stock of International PhDs -Total:	20.237 (21.14)	9.277 (12.92)	23.89 (28)	58.23 (79.48)	27.367 (36.95)
Stock of Permanent Resident PhDs	3.818 (4.84)	1.721 (2.80)	5.719 (8.50)	9.651 (12.84)	4.122 (5.97)
Stock of Temporary Resident PhDs	14.474 (15.26)	6.939 (10.06)	15.401 (19.5)	43.281 (57.56)	20.205 (28.318)
Stock of other PhDs	1.945 (5.66)	0.618 (2.26)	2.771 (7.36)	5.298 (21.46)	3.04 (9.98)
Technology Transfer Office	0.5 (0.50)	0.557 (0.50)	0.498 (0.50)	0.512 (0.50)	0.493 (0.50)
Top 110 Institution	0.526 (0.40)	0.593 (0.49)	0.538 (0.50)	0.536 (0.50)	0.525 (0.50)
Top 25 in Chemical Field	0.162 (0.37)	0.193 (0.40)	0.164 (0.37)	0.168 (0.37)	0.16 (0.37)
Top 25 in Computer & Communications	0.123 (0.33)	0.146 (0.35)	0.125 (0.33)	0.128 (0.33)	0.122 (0.33)
Top 25 in Drugs & Mechanical	0.169 (0.38)	0.194 (0.4)	0.17 (0.38)	0.173 (0.38)	0.166 (0.37)
Top 25 in Electrical, Electronics & Mechanical	0.286	0.339	0.288	0.296	0.282

	(0.45)	(0.47)	(0.45)	(0.46)	(0.45)
Top 25 Institution	0.344	0.404	0.347	0.354	0.339
	(0.48)	(0.49)	(0.48)	(0.48)	(0.47)
Private Institution	0.383	0.358	0.397	0.371	0.398
	(0.49)	(0.48)	(0.49)	(0.48)	(0.49)
Number of Observations	2310	1925	2288	2231	2343
Number of Programs (Institutions)	154	143	153	152	157

^a The data set for the count of PhDs (by visa status) comes from the Survey of Earned Doctorates, Science Resources Statistics, NSF (restricted data).

Table B2. Results from Individual Effects Model by Academic Field with Top 110 Ranking Dummy Variable (1985-1999)
Dependent variable: Patent Issued to all Institutions

Variable	Coefficient Estimate (t-ratio) from Specification 4				
	Chemical	Computer & Communications	Drugs & Medical	Electrical, Electronic and Mechanical	Other Field
Log Stock of R&D Expenditure	0.2833***	0.1600**	0.3638***	0.3957***	0.2508***
	(3.97)	(2.38)	(6.06)	(5.99)	(3.27)
Log faculty_4	-0.0285	-0.2557**	0.0958	-0.0218	-0.2299*
	(0.42)	(2.08)	(1.59)	(0.28)	(1.74)
All Postdocs_4	-0.0431	-0.4537	0.0506***	-0.1117	-0.0797
	(0.25)	(0.28)	(2.82)	(0.83)	(0.20)
Stock of All PhDs	-0.0068	0.9536***	0.0168	0.1985***	0.3554***
	(0.05)	(3.22)	(0.23)	(4.94)	(2.72)
Technology Transfer Office	0.4242***	0.2055	0.2881***	0.3054***	0.3210**
	(5.64)	(1.44)	(4.21)	(3.63)	(2.34)
Top 110 Institution	0.7971***	1.3738***	0.8109***	0.7859***	0.3496
	(3.96)	(4.74)	(3.47)	(4.07)	(1.39)
Minus log likelihood	3052	1335	3130	2506	1390
AIC	6151	2718	6308	5059	2827
BIC	6290	2851	6446	5196	2965

Notes:

- (a) Absolute value of t statistics within parentheses.
- (b) *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.
- (c) All specifications control for year effects.
- (d) Results for postdoc and PhD variables are expressed in 100s.

Table B2 Continued

Variable	Coefficient Estimate (t-ratio) from Specification 10				
	Chemical	Computer & Communications	Drugs & Medical	Electrical, Electronic and Mechanical	Other Field
Log Stock of R&D Expenditure	0.2818***	0.1658**	0.3425***	0.3986***	0.2395***
	(3.96)	(2.49)	(5.49)	(5.99)	(3.12)
Log faculty_4	-0.0326	-0.2271*	0.0970	-0.0112	-0.1825
	(0.48)	(1.85)	(1.57)	(0.14)	(1.37)
US and Permanent Resident Postdocs_4	0.0980	1.9046	0.0787	-0.2929	0.8924
	(0.33)	(0.92)	(1.60)	(1.36)	(1.53)
Temporary Resident Postdocs_4	-0.0598	-4.0976	0.0119	0.1074	-0.7651
	(0.26)	(1.36)	(0.34)	(0.42)	(1.02)
Stock of US PhDs	0.4336**	1.6713***	0.1149	0.2031**	0.2636
	(2.39)	(3.54)	(1.16)	(2.26)	(1.15)
Stock of Permanent Resident PhDs	0.0495	0.8248	0.3435	-0.0858	-2.5424***
	(0.08)	(0.40)	(1.17)	(0.32)	(2.72)
Stock of Temporary Resident PhDs	-0.7025**	-0.1211	-0.2436	0.2110**	0.8143**
	(2.51)	(0.19)	(1.43)	(2.15)	(2.54)
Stock of Other PhDs	-0.0726	3.8851***	-0.1382	0.3525***	0.5114*
	(0.22)	(3.40)	(0.57)	(4.15)	(1.69)
Technology Transfer Office	0.4348***	0.3051**	0.2909***	0.3216***	0.3313**
	(5.80)	(2.09)	(4.22)	(3.75)	(2.42)
Top 110 Institution	0.7079***	1.3198***	0.8120***	0.7768***	0.4144
	(3.49)	(4.69)	(3.46)	(4.01)	(1.64)
Minus log likelihood	3046	1329	3128	2503	1383
AIC	6148	2713	6311	5061	2822
BIC	6309	2869	6472	5221	2983

Notes:

- (a) Absolute value of t statistics within parentheses.
- (b) *, ** and *** indicate statistical significance at 10%, 5%, and 1% respectively.
- (c) All specifications control for year effects.
- (d) Results for postdoc and PhD variables are expressed in 100s.

Table B3. Estimation Results form Individual Effects Model by Academic Field with Top 25 Field Ranking Dummy Variable (1985-1999)
Dependent Variable: Patent Issued to all Institutions

Variable	Coefficient Estimate (t-ratio) from Specification 4			
	Chemical	Computer & Communications	Drugs& Medical	Electrical, Electronic and Mechanical
Log Stock of R&D Expenditure	0.3135***	0.1927***	0.3984***	0.4098***
	(4.37)	(2.92)	(7.11)	(5.97)
Log faculty_4	-0.0192	-0.1697	0.1144*	-0.0141
	(0.28)	(1.39)	(1.89)	(0.18)
All Postdocs_4	-0.0647	-0.6895	0.0422**	-0.1281
	(0.37)	(0.42)	(2.35)	(0.96)
Stock of All PhDs	-0.0567	0.8974***	0.0320	0.1847***
	(0.43)	(2.94)	(0.44)	(4.45)
Technology Transfer Office	0.4368***	0.2157	0.2839***	0.3112***
	(5.79)	(1.51)	(4.12)	(3.70)
Top 25 in Chemical Field	0.5118**			
	(2.08)			
Top 25 in Computer & Communications		0.7311**		
		(2.21)		
Top 25 in Drug & Medical			0.6934***	
			(2.99)	
Top 25 in Electric, Electronics & Mech.				0.4564**
				(2.29)
Minus log likelihood	3057	1343	3131	2511
AIC	6162	2735	6310	5070
BIC	6300	2868	6447	5207

Notes:

(a) Absolute value of t statistics within parentheses.

(b) *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.

(c) All specifications control for year effects.

(d) Results for postdoc and PhD variables are expressed in 100s.

Table B3 Continued

Variable	Coefficient Estimate (t-ratio) from Specification 10			
	Chemical	Computer & Communications	Drugs & Medical	Electrical, Electronic and Mechanical
Log Stock of R&D Expenditure	0.3105***	0.2049***	0.3796***	0.4117***
	(4.33)	(3.11)	(6.50)	(5.96)
Log faculty_4	-0.0259	-0.1512	0.1124*	-0.0045
	(0.38)	(1.24)	(1.82)	(0.06)
US and Permanent Resident Postdocs_4	0.0911	1.9874	0.0552	-0.3194
	(0.31)	(0.95)	(1.12)	(1.49)
Temporary Resident Postdocs_4	-0.0643	-4.4665	0.0099	0.1051
	(0.28)	(1.50)	(0.29)	(0.42)
Stock of US PhDs	0.4215**	1.5609***	0.1298	0.1863**
	(2.25)	(3.29)	(1.31)	(2.06)
Stock of Permanent Resident PhDs	0.0615	0.6200	0.3606	-0.1122
	(0.10)	(0.30)	(1.24)	(0.42)
Stock of Temporary Resident PhDs	-0.8022***	-0.0010	-0.2301	0.2023**
	(2.87)	(0.00)	(1.37)	(2.05)
Stock of Other PhDs	-0.1122	3.6436***	-0.1766	0.3423***
	(0.32)	(3.16)	(0.74)	(4.02)
Technology Transfer Office	0.4473***	0.3120**	0.2866***	0.3277***
	(5.95)	(2.12)	(4.13)	(3.81)
Top 25 in Chemical Field	0.4318*			
	(1.70)			
Top 25 in Computer & Communications		0.6088*		
		(1.85)		
Top 25 in Drug & Medical			0.7111***	
			(2.98)	
Top 25 in Electric, Electronics & Mech.				0.4593**
				(2.30)
Minus log likelihood	3051	1338	3129	2508
AIC	6157	2731	6313	5071
BIC	6318	2887	6474	5231

Notes:

(a) Absolute value of t statistics within parentheses.

(b) *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.

(c) All specifications control for year effects.

(d) Results for postdoc and PhD variables are expressed in 100s.